Final Report

Vanuatu Inter-Island Shipping Support Project (Phase II)

Volume 1: Main Report

April 2010

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CURRENCY EQUIVALENTS

(as of 23 Sept. 2009)

Currency Unit	–	United States Dollar ($)
	–	Vanuatu Vatu (Vt)
		Australian Dollar (AUD)
		New Zealand Dollar (NZD)
$1.00	=	Vt100
$1.00	=	NZD1.5
$1.00	=	AUD1.2

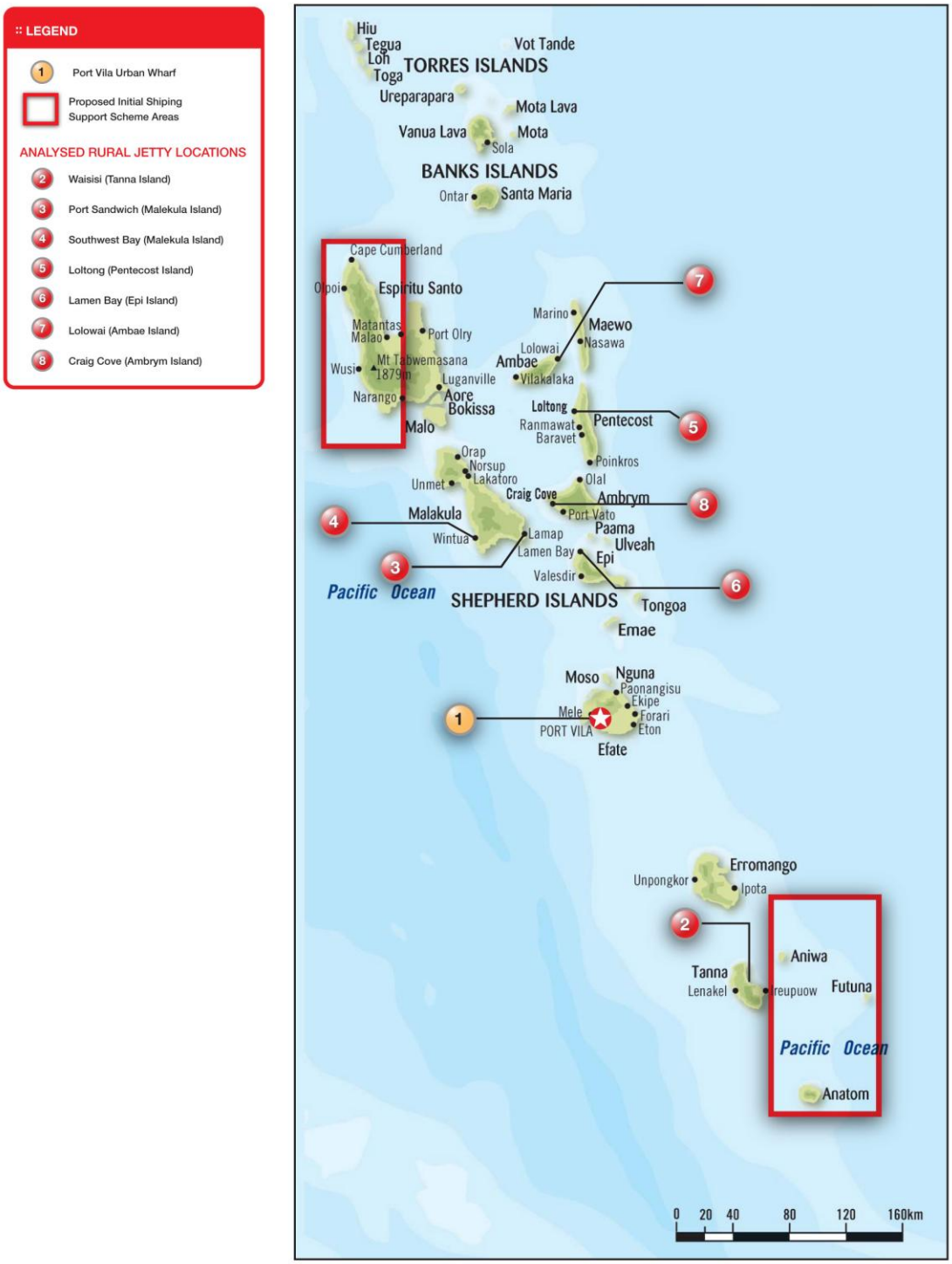
ABBREVIATIONS

ADB	–	Asian Development Bank
AFD	–	Agence Française de Développement
AIDS	–	Acquired Immune Deficiency Syndrome
ARI	–	acute respiratory infection
AusAID	–	Australian Agency for International Development
BNPL	–	basic needs poverty line
CCAMLR	–	Convention to the Conservation of Antarctic Marine Living Resources
CD	–	Chart Datum
CoA	–	Chart of Accounts
COM	–	Council of Ministers
CPI	–	consumer price index
CRP	–	Comprehensive Reform Program
DA	–	Delegated Authorities
DFID	–	Department for International Development (UK)
DG	–	Director General
DIA	–	Department of Internal Affairs
DPH	–	Department of Ports and Harbours
DWT	–	Dead Weight Tonnes
EA	–	Executing Agency
EEZ	–	exclusive economic zone
EIRR	–	Economic Internal Rate of Return
EMMP	–	Environmental Monitoring and Mitigation Plan
ER	–	Economic Requirements
ETA	–	Estimated Time of Arrival
ETD	–	Estimated Time of Departure
EU	–	European Union
FAP	–	Financial Accounting Policies
FIDIC	–	International Federation of Consulting Engineers
FIRR	–	Financial Internal Rate of Return
FO	–	Finance Officer
FNPV	–	Financial Net Present Value
FPL	–	food poverty line
FR	–	Financial Regulations; 2000
FSM	–	Federated States of Micronesia
GDP	–	Gross Domestic Product
GfG	–	Governance for Growth
GIP	–	Government Investment Program
GoV	–	Government of Vanuatu
GRT	–	Gross Registered Tonnes

HDR	–	Human Development Report
HIES	–	Household Income and Expenditure Survey
HIV	–	Human Immunodeficiency Virus
HPI	–	Human Poverty Index
IEE	–	Initial Environmental Examination
IMO	–	International Maritime Organisation
ISPS	–	International Ship and Port Security
IWS	–	Ifira Wharf and Stevedoring Company Limited
JICA	–	Japan International Cooperation Agency
kN	–	Kilo Newton
kt	–	knot
LAT	–	Lowest Astronomical Tide
LL	–	Load Lines
LOA	–	Length Overall
LPO	–	Local Purchase Orders
MCA	–	multi-criteria analysis
MCC	–	Millennium Challenge Corporation
MFEM	–	Ministry of Finance and Economic Management
MHHW	–	Mean Higher High Water
MIPU	–	Ministry of Infrastructure and Public Utilities
MIS	–	Management Information Systems
MLLW	–	Mean Lower Low Water
MPa	–	Megapascal (unit of measure for pressure)
NAVAIDS	–	Navigational Aid System
NBV	–	National Bank of Vanuatu
NGO	–	Non-Government Organization
NISCOL	–	Northern Islands Stevedoring Company Limited
NPV	–	Net Present Value
NTDP	–	national transport development plan
NZ$	–	New Zealand Dollars
NZAID	–	New Zealand's International Aid and Development Agency
O&M	–	Operation and Maintenance
OIIDP	–	Outer Islands Infrastructure Development Project
PAA	–	Priorities and Action Agenda
PCR	–	Project Completion Report
PFEMA	–	Public Finance and Economic Management Act 1998
PGI	–	Poverty Gap Index
PIANC	–	Permanent International Association of Navigation Congresses
PPAR	–	Project Performance Audit Report
PPP	–	purchasing power parity
PSC	–	Project Steering Committee
PWD	–	Public Works Department
REDI	–	Rural Economic Development Initiative
SCF	–	Standard Conversion Factor
SEMP	–	Safety and Environmental Management Program
SMS	–	Short Message Service
SOE	–	State Owned Enterprises
SOLAS	–	Safety of Life at Sea
SR	–	Safety Requirements
SSM	–	Safe Ship Management
SSS	–	Shipping Services Support
STCW	–	Standards of Training, Certification and Watchkeeping for Seafarers
STD	–	Sexually Transmitted Disease
SWOT	–	Strengths, Weaknesses, Opportunities and Threats analysis

TA	–	Technical Assistance
TOR	–	Terms of Reference
UBP	–	Universal Bearing Piles
UC	–	Universal Column
UKC	–	under-keel clearance
UNCLOS	–	United Nations Convention on the Law of the Sea
UNDP	–	United Nations Development Program
VANRIS	–	Vanuatu Resource Information System
VANWODS	–	Vanuatu Women Development Scheme
VAT	–	Value Added Tax
VCMB	–	Vanuatu Commodities Marketing Board
VIMP	–	Vanuatu Infrastructure Master Plan
VIP	–	ventilated improved pit
VIPA	–	Vanuatu Investment Promotion Authority
VISSP1	–	Vanuatu Inter-island Shipping Study Phase I
VMA	–	Vanuatu Maritime Authority
VMSL	–	Vanuatu Maritime Services Limited
VSA	–	Volunteer Services Abroad
Vt	–	Vatu
VTTSP	–	Vanuatu Transport Sector Support Program

PROJECT ANALYSIS MAP



Summary

I. Call to Action

1. In Vanuatu inter-island shipping is a vital part of economic and social development. This is especially the case for remote communities and outer islands.

2. Economic and social development go hand-in-hand – many social issues such as poverty reduction cannot be easily overcome without economic development. Trade is one of the main generators of economic development and it is also one of the main consequences. Since trade cannot occur without transport, an affordable, accessible, reliable and safe transport system is essential to economic and social development. Anything that hinders transport hinders trade.

3. Vanuatu has nearly 80 islands in its archipelago, and communities are widely dispersed across the country. Urgent improvements are needed to the overall domestic sea transport system if the benefits of trade and social development are to occur equitably.

4. Present shipping services are hindered by poor support infrastructure, lack of compliance with safety requirements and an under resourced Ministry of Infrastructure and Public Utilities. Neither the few remaining infrastructure facilities nor many of the ships in the aging domestic fleet receive proper maintenance.

5. The Government of Vanuatu recognises these as pressing problems, requiring urgent action if economic development is to occur and be sustained. They will require assistance to bring about the recommended improvements to its sea transport system detailed in this report.

II. Vanuatu Domestic Shipping: A Sector in Crisis

6. The main immediate challenges facing the domestic shipping sector are as follows:

- **Domestic Shipping Services**: Sustainable economic and social development is hindered in some remote outer island communities by inadequate shipping services – particularly Banks and Torres, West Santo and Tafea outer islands. Shipping services to these locations currently earn too little revenue from cargo and passengers to make frequent services commercially viable. These remote communities and other outer islands also suffer from inconsistent quality of shipping services. During Phase II regular and relatively frequent shipping services were being established to Banks and Torres.
- **Lack of maritime infrastructure**: Port Vila is in critical need of a new domestic wharf. The current domestic wharves in Port Vila are in poor repair - the Star Wharf is dangerous and should be demolished, while Dinh Wharf has been sold and is to cease operating at the end of 2010. There is little maritime transport infrastructure in the outer islands other than a wharf at Litzlitz on Malakula, and at Lenakel on Tanna, both in need of maintenance. The government-owned Simonsen Wharf at Luganville is also in need of rehabilitation, although this could be deferred by up to 5 years. Vanuatu is without a serviceable slipway and ships that need to be 'slipped' must sail to Honiara or Suva.
- **Poor-quality infrastructure and deferred maintenance**: In the past, wharves in Vanuatu have been made from coral rock fill topped with a concrete deck slab made from coral aggregate. This design does not meet current international standards and insufficient resources have been devoted to ensuring sufficient levels of ongoing maintenance. Vanuatu's geographic location, means that maritime structures are exposed to severe cyclones and associated wave action. Inadequate design specifications, shoddy construction quality, lack of maintenance and inhospitable environmental conditions has meant that many structures have not survived the duration of their design life.
- **Economic Impact**. The rate of economic growth in Vanuatu is commensurate with the rate of rural population growth. This is indicative of the subsistence nature of rural

agricultural production. As a consequence of the lack of access to markets, individuals tend to plan production levels on what is needed for short term local consumption with little in the way of surplus for exchange, saving and growth. Any surplus produced from these communities is shipped to the urban centres of Luganville and Port Vila for domestic urban consumption and sometimes export. The small cash income received by the producers is then mainly used to pay for imported goods and school fees.

- **Abundance of previous studies - but little action**: Over the last 30 years there have been numerous domestic shipping studies and recommendations but little investment, reform, or improvement. There is a mounting risk that the mistrust held by ship operators and users of shipping services towards donors and central government that already exists will strengthen if action, this time round, is not taken directly.
- **Legal framework**: The repeal in 2007 of the Vanuatu Maritime Authority Act resulted in some confusion for the administration of the main Maritime and Shipping Acts. Marine pollution, the marine environment, oil spills and conservation requirements are unattended within the current legal framework. The present legal framework was inherited from the colonial era – with few improvements since. The 1981 Maritime Act (providing for an international shipping register) together with the Vanuatu Maritime Authority Act of 1998, have dominated the Vanuatu shipping industry - together they have tended to blur the responsibility between the economic and safety requirements of the industry and to distance the government from some of its responsibilities.
- **Safety issues**: Today the principal safety concerns for domestic shipping are: overloading ships and not monitoring ship stability, inadequate competency of ships' senior personnel for the operations involved, the unsafe condition of some domestic wharves, and, the low level of compliance and lack of enforcement. Current safety regulations are not rigorously enforced, as there is no slipway for ships to undergo necessary repairs. A new slipway would enable the government to more readily enforce its safety standards without 'beaching' a sizable proportion of the domestic fleet and reduce the risk of maritime disaster.
- **Institutional arrangements**: The structure and division of responsibilities in the current maritime administration is confusing, inefficient, and at times inappropriate. There is insufficient separation between economic and safety requirements, which has the potential to lead to malpractices. MIPU has a small Office of Maritime Affairs, but is still resource constrained in its role of developing shipping policy. It is also involved in maritime regulation and service delivery. The Department of Ports and Harbours (DPH) is responsible for regulation and providing marine services such as safety regulatory oversight to domestic shipping, port state control, port and marine services for international shipping including security, and, the maintenance oversight of marine infrastructure in Vanuatu. It is also responsible for administering the Shipping Act and the Ports Act while the Ministry of Finance and Economic Management (MFEM) is responsible for the administration of the Maritime Act and managing the international shipping register, a task for which it has neither the capability nor capacity. The administration of international shipping register has never been audited.

III. Solutions and Recommendations

Recommendation One: The establishment of a shipping support scheme that supports both the supply and demand sides of the domestic shipping market.

7. The shipping support scheme comprises two components: a Shipping Services Support Scheme plus a Shipping and Community Co-ordinator Scheme.

8. The Shipping Services Support Scheme is a supply side government intervention in the domestic market and is initially envisaged as operating for two years [refer section 1.1.4 & s 1.1.14] though this could be extended if necessary. The objective of the Scheme is to provide shipping services to remote communities in the expectation that this will generate trade in

response to these services and that after a short period the services will become commercially viable.

9. Five initial locations have been identified to receive shipping services support: Futuna, Aniwa, Aneityum, West Santo, and Big Bay [s 1.1.2]. Depending on the domestic shipping market performance and the availability of shipping services, it is possible that other locations may merit support and that overall support could continue beyond the initial two years. Alternatively, it is also possible that with the assistance of a shipping and community coordinator, shipping services to some remote communities could be commercially viable sooner. It is recommended that in order to minimize the impact of government intervention in the shipping market, shipping services support be on a voyage-by-voyage basis as the need arises. [s 1.1.4].

10. It is recommended that the GoV continue to provide annual funding to support the Shipping Services Support Scheme and that the amount to be funded reassessed annually in advance. [s8.9 and s8.10]

11. The shipping coordinator scheme is a demand-side government intervention intended to: coordinate local shipping requirements in remote outer island communities. The Coordinator will promote the consolidation of cargo, facilitate the dissemination of information about shipping services and requirements, and coordinate shipping services support. He/she will also collect data on trade volumes and shipping services performance to better direct any further support (market intervention) [s 1.2.3].

12. It is envisaged that the shipping coordinator scheme would initially be required for five years [s 8.9 & s8.10] but that it be reviewed after the first two years [s 1.2.16]. It would be highly complementary for the shipping coordinator scheme to be integrated with any forthcoming improvements to agricultural extension services and cooperatives.

13. Both the shipping services support scheme and the shipping coordinator scheme would be controlled by and under the overall administration of the MIPU (office of maritime affairs). Day-to-day administration of the shipping services support scheme (voyage charter arrangements) would be carried out by a reputable accounting firm in Port Vila. It is envisaged that the shipping coordinator (to be appointed by the MIPU) would be located in the offices of the accounting firm and supported by eight on-site local coordinators in remote communities (to be appointed by their local communities) [s1.2.4-6]. It is also recommended that a capacity building specialist (to be supported by a donor) be appointed at the start to assist in establishing the shipping awareness programme and communications network [s 1.2.4, s1.2.7].

Shipping Services Support Scheme and Shipping Coordinator Scheme				
			Vatu	US dollars
Cost	Shipping Services Support	Year 1&2	8.9 million	88,800
	Shipping Coordinator Scheme	Year 1 Year 2	a. million 7.3 million	129,000 73,000
	Capacity Building Specialist		5.4 million	54,240
	TOTAL:		34.5 million	345,040
Personnel Requirements	one shipping coordinator (local), eight on-site coordinators (local), one capacity building specialist (international), one accounting firm (local)			
External Financing	one capacity building specialist (international) USD 54,240 (Vt 5.4 million)			
Urgency	high			
Start Date	immediately			
End Date	within two to five years			

Recommendation Two: Rehabilitation and repairs of existing maritime infrastructure

14. Vanuatu's marine infrastructure has suffered for many years from inadequate investment in maintenance programmes. The government needs to act quickly to ensure that their investment in existing wharves and jetties is not wasted, and to demonstrate that maintenance of infrastructure is a priority. It is recommended that a programme of rehabilitation and repairs for existing wharves be undertaken as follows:

(i) immediate repairs to Simonsen wharf at Luganville and long-term rehabilitation of the wharf be commenced by 2014 [refer section 2.2.2 & s5.8.2];

(ii) repairs at Lenakel wharf on Tanna to improve its safety and serviceability [s2.2.3 & s5.8.1];

(iii) repairs at Litzlitz wharf on Malakula to improve its serviceability and that consideration be given to building a ramp for landing craft [s2.2.4 & s5.8.1]; and

(iv) because Marine Quay has reached the end of its structural life it be demolished; [s2.2.1 and s2.3.1].

Rehabilitation of Current Infrastructure			
		Vatu	US dollars
Cost	repair & rehabilitation Simonsen wharf Port Vila	Vt 128.4	97,750
	refurbish Lenakel wharf and rebuild ramp	Vt111.8 million	1,118,440
	refurbish Litzlitz Wharf and build Ramp	44.3 million	443,090
	demolition Marine Quay	33.6 million	336,020
	TOTAL:	**Vt 199.5 million**	**USD 1,995,300**
Personnel Requirements	international engineering & construction firms		
External Financing	donor funds		
Urgency	High to medium		
Start Date	as soon as possible		
End Date	within two years		

Recommendation Three: Construction of new maritime infrastructure for Port Vila and selected outer island sites.

15. It is recommended that a new wharf be immediately constructed at Port Vila [refer s2.5.1 & s2.6.2]. Failure to provide additional domestic wharf capacity in Port Vila could result in a potential economic loss to Vanuatu of up to 1% of GDP, conservatively estimated to be in the order of Vt519 million per year, simply because wharf capacity will be unable to satisfy current traffic projections.

16. The South Paray Bay site has been used in the design concept as a suitable representative site for Port Vila [s2.6.1] and it is the recommended site for a domestic wharf. The new Port Vila facility should provide for:

(i) sufficient length and depth to berth the three largest domestic ships (108m berth length and 3.0m water depth below chart datum),

(ii) two landing craft ramps

(iii) some 2,200m^2 backup land and suitable road access,

(iv) passenger shelter, a freight collection booth,

(v) water and electricity supplies for use of ships, and

(vi) sufficient space for a cargo shed in the future.

17. It is emphasised that a new domestic wharf for Port Vila should be built as soon as possible because by December 2010 it is likely that there will be no available wharves in Port Vila to service domestic ships. A fourth berth and back-up land is likely to be needed in 20 years time (2030) [s2.5.1, s2.6.2] - this is referred to as Stage 2.

18. Economic analysis has revealed that planned construction or rebuilding of four outer island jetties at Lolowai, Loltong, Wasisi and Port Sandwich all yield positive rates of return and should proceed to the detailed design stage if finance permits [s5.7.2 & s5.8].

19. Because of the very high risk of damage from severe cyclones and associated wave action and the persistent lack of maintenance, wharves and jetties in Vanuatu should be designed for a 50 year engineering design life. Infrastructure works should therefore be constructed according to a relatively high capital cost in order to minimize ongoing maintenance needs and costs. This has been adopted in the engineering design, specifications and so costs estimations [s3.1.2]. Accordingly it is recommended that new wharf facilities in Port Vila be designed and built in accordance with the principles described in the preliminary design and specifications [s3.2]; and that new outer island jetty facilities be designed and built in accordance with the principles described in the representative jetty design and specification [s3.5 & s3.6].

20. It is also recommended that possibilities for the development of a slipway under some form of private sector participation be investigated.

New Maritime Infrastructure			
		Vatu	US dollars
Cost	Port Vila stage 1: 3 berths + 2 landing ramps	812.4 million	8,124,050
	Port Vila stage 2: additional general berth (2030)	Vt 128.4 million	1,284,050
	Total cost Loltong jetty + 3 other OI Jetties	865.2 million	8,651,840
	TOTAL:	**1,806.0 million**	**18,059,940**
Personnel Requirements	international engineering & construction firms		
External Financing	donor funds		
Urgency	very high for Port Vila and medium for outer islands		
Start Date	as soon as possible		
End Date	within two years		

Recommendation Four: Undertake reforms to Vanuatu's legal and regulatory maritime systems, including redrafting and simplification of maritime law.

21. There are a number of very good reasons for separating the economic requirements from the safety and security requirements in the legal framework (and institutional arrangements) that administer the maritime system. Accordingly it is proposed that Vanuatu's maritime law be consolidated into three (Bills) Acts to replace the existing 17 or so Acts that currently govern the Vanuatu maritime system.

(i) a Sea Transportation (Bill) Act to provide for the transport (economic) requirements of Vanuatu's sea transport markets – shipping, ports and territorial waters [refer section 6.11]

(ii) a Maritime Safety (Bill) Act to provide for the safety and security requirements of Vanuatu's maritime system [s6.12]; and

(iii) a Ship Registration (Bill) Act to provide for the registration of ships in Vanuatu [s 6.13]

22. The Sea Transportation (Bill) Act will incorporate provisions for the establishment of ports, economic regulation, marine pollution and environmental protection, expand on existing economic provisions scattered throughout a number of current Acts and establish a Maritime Fund to receive and distribute funds (grants, revenue from fees, leases, interest, etc) [appendix 6.2]. It is likely that technical assistance will be needed during the drafting process.

23. For the Maritime Safety (Bill) Act new provisions will be incorporated to provide for the life cycle approach to safety regulation; accordingly it will provide for the safety regulation of ship operations, ports, port state control and flag state control [appendix 6.1 and appendix 6.3].

24. The Ship Registration (Bill) Act will establish two shipping registers: an international one and a domestic register. Technical assistance will be needed during the drafting process.

25. The Maritime Fund is relevant to all three Acts and so the Sea Transport (bill) Act will need to commence before the two other Acts. It is, however, highly desirable that the three Bills (Acts) be drafted more or less in parallel. Once the Acts are in place then Vanuatu will urgently need to update its safety regulations [s6.14] as well as those pertaining to the maritime markets [appendix 6.2] and ship registration [appendix 6.4].

26. The three Acts envisage a significant cultural change within the maritime sector. It is likely that it will take up to five years before a satisfactory safety and economic regulatory framework and oversight strategy will be in place – the regulatory transitional requirements for ship registration, however, should be able to (will need to) be made quickly. In the meantime safety oversight of domestic shipping should focus on: passenger loading, cargo overloading and ship stability, competency of ships' crews and the safety of wharf operations [s6.14].

27. The proposed legal reforms to the maritime system need to be supported by and reflected in appropriate institutions responsible for the administration and regulatory oversight of the maritime system and its markets, as detailed below in recommendation five.

Legal and regulatory reforms			
		Vatu	US dollars
Cost	Legal Technical specialist 12 months	**35 million**	**350,000**
Personnel Requirements	international legal technical specialist		
External Financing	donor funds		
Urgency	high		
Start Date	as soon as possible		
End Date	within one year to 18 months for the drafting of the three (Bills) Acts but it likely to be up to five years before a satisfactory regulatory and oversight regime is established		

Recommendation Five: Establish a new national Maritime Safety Administration, strengthen MIPU's policy unit, and ensure economic and safety regulations are monitored by separate agencies.

28. Key international maritime law instruments and the International Maritime Organisation require a flag state such as Vanuatu to have a competent national maritime administration to set national standards for the safety and security of maritime operations and seek compliance with those standards. At the very least Vanuatu needs to establish a maritime administration to fulfil its flag state and port state responsibilities, and to ensure that merchant ships comply with international maritime standards and national or domestic maritime standards as applicable. Such a national maritime administration is also required to administer the transport or economic requirements of the sea transport system. [Refer section 7.9.1]

29. For a flag state like Vanuatu that maintains an open international shipping register and where its maritime system is a vital part of the country's economic and social development, its

national maritime administration needs to be supported by a number of well defined policies, authority and a mandate to ensure that the government's obligations and responsibilities are carried out [refer section 7.9.1]. These include:

- the registration of ships;
- establishing safety and security standards;
- regulating shipping, ports, navigation and other marine operations plus the functional supervision (inspecting, auditing, etc) of these operations – including flag state control, port state control and the sea transport markets;
- maintaining the body of Vanuatu law concerning all maritime matters;
- certifying and registering seafarers;
- ensuring the provision of nautical information;
- conducting maritime accident and incident investigations;
- monitoring Vanuatu's sovereignty interests over its territorial waters, continental shelf and exclusive economic zone;
- administering international maritime law instruments to which Vanuatu is a party; and
- representing the interests of Vanuatu with international organisations and with agencies of foreign governments with similar maritime interests.

30. It is recommended that these obligations, responsibilities and duties be split between a maritime safety regulator and the maritime policy unit within the MIPU, which together would constitute a competent national maritime administration. The safety requirements would be allocated to the safety regulator and the economic or sea transport requirements allocated to the MIPU maritime policy unit. Such an allocation will maintain a separation of the economic and safety requirements within the maritime system, however, the administration of all international maritime law instruments to which Vanuatu is a party to will be the responsibility of the MIPU Maritime Policy Unit. [s7.9.1].

31. It is recommended that the safety regulator be called the Maritime Safety Administration of Vanuatu and that it focus on the following:

(i) safety regulation oversight of ship operations;

(ii) wharf infrastructure safety,

(iii) seafarer competency and

(iv) maintaining the body of law concerning all maritime safety matters [s 7.9.2, s7.10.1]

32. The proposed Maritime Safety Administration would have an initial establishment of 14 people divided evenly between Port Vila and Luganville. The Maritime Safety Administration would be a directorate within the MIPU and headed by a Director of Maritime Safety – in much the same way as the existing Civil Aviation Authority is organised [s7.10.1, s7.12]. To help establish the Maritime Safety Administration and in particular to set up an appropriate safety regulatory and oversight regime it is strongly recommended that a technical adviser be provided for a period of up to five years [s7.12.3].

33. The Maritime Policy Unit will be the chief policy adviser to the Minister (Government) on all maritime matters – both economic and safety – and responsible for implementing the Government's economic and sea transport requirements. In particular for maintaining all Vanuatu maritime law, administering international law instruments to which Vanuatu is a party, managing the domestic and international shipping registers, monitoring and managing action taken by the Minister (Government) to intervene in the sea transport markets, initiating maritime accident and incident investigations, monitoring Vanuatu's sovereignty interests and establishing

a Maritime Register. It is also recommended that the Registrar of Ships be the manager of the Maritime Policy Unit and the Shipping Registration Office notionally be the MIPU. The administration of the international shipping register would continue to be carried out under contract to Vanuatu Maritime Services Limited. [s7.9.3].

34. The Government (MIPU) has taken upon itself to provide certain maritime facilities and services – these are strictly trading activities within the sea transport markets. They are currently provided by the Department of Ports and Harbours. It is recommended that the safety regulatory functions be moved from this department leaving only the trading or economic activities, namely: pilotage and berthing services, towage, navigation aids and nautical information plus port security. It is recommended that this new department be called the Department of Ports and Marine (DPM). [s7.10.2] It is proposed that the new DPM have an establishment of 54 split between Port Vila (33) and Luganville (21). The focus of the DPM is international shipping and port services. [s7.11].

Institutional Strengthening of Maritime Affairs			
		Vatu	US dollars
Cost	Maritime safety regulatory technical adviser (5 years)	**Vt 93 million**	**930,000**
Personnel Requirements	international technical advisor		
External Financing	donor funds		
Urgency	Very high		
Start Date	on or just before the establishment of the Maritime Safety Administration		
End Date	up to five years from the establishment of the Maritime Safety Administration		

Recommendation Six: Build the capacity of Vanuatu's Financial Risk Management Systems.

35. Financial policies and procedures in general were found to be clear, unambiguous, and focused on the control and accounting for government revenue inflows and expenditure outflows. However, existing systems do not have sufficient reporting and control mechanisms to isolate and track large project-related expenditure (e.g. labour, materials, etc). There are some variations between written directives and those actually being performed by the MIPU that are the result of improvements to procedures arising from new information technology introduced but yet to be amended in directives. The GoV has adopted the International Accounting Standards and applied them to its financial reporting. The financial management system is sufficiently flexible to provide information reports for individual budgeted programs as long as these are based on the established Chart of Accounts and the MFEM has approved each report along with the new budgeted program. The Audit Office has not audited MIPU during the last ten years and this needs to be rectified.

36. To improve financial management and mitigate risks it is recommended that:

(i) the MIPU be audited as soon as possible; [see section 8.6.1];

(ii) donor technical assistance (estimated at Vt 13.712 million) be sought to reinvigorate and re-establish an internal audit section in the Auditor General Office so that annual audits of government ministries are performed annually; [s8.6.1]

(iii) in the absence of supporting systems and lack of capacity at the MIPU an "Engineer" be engaged to oversee the quality construction of major infrastructure work, to manage and account for the flow and disbursement of investment funds, and to provide "on-the-job" training to MIPU staff; to cover this a cost of Vt 27.7 million has been included in the capital construction costs of South Paray Wharf; [s8.7.2]

(iv) donor technical assistance (estimated at Vt 7.4 million) be provided to improve communications and reporting throughout government Ministries and to reduce the costs of operation; [s 8.5.4]

(v) donor technical assistance be provided to revise and update existing international port and water tariffs (to recoup Vt 16 million and Vt 9 million respectively); and to establish ship and cargo operations performance measures; [s8.5.1]

(vi) donor technical assistance (estimated to cost Vt 4.6 million including work of updating the tariffs) be provided to review GoV debt policies to improve the GoV fiscal position (by Vt 15 million annually) including the application and enforcement of penalties [s8.5.2. s8.5.1]

(vii) donor technical assistance (estimated at Vt 20.6 million) be provided to implement an inventory software system for the GoV [s8.6.4]

(viii) donor technical assistance (estimated at Vt 57.4 million) be provided to support an environmental specialist seconded to the MIPU Environmental Unit for up to 12 person months [appendix 3.5]

Building Capacity of Vanuatu's Financial Risk Management Systems			
		Vatu	US dollars
Cost	TA – MIPU Environmental Unit	57.426 million	574,260
	TA - Auditor General Office	13.712 million	137,120
	TA - communications & reporting GoV ministries	7.428 million	74,280
	TA – tariff, debt policy review	4.606 million	46,060
	TA – inventory software system	20.608 million	206,800
	TOTAL:	**Vt 103.754 million**	**USD 1.037,540**
Personnel Requirements	international technical adviser (5)		
External Financing	donor funds		
Urgency	very high (Auditor General Office), high (tariff, debt policy), medium (others)		
Start Date	as soon as possible		
End Date	within two year		

Recommendation Seven: Implementation should be a Package Deal

37. To obtain the maximum benefit for the people of Vanuatu from the sea transport system in terms of safety, effectiveness and efficiency plus economic and social development, the sub projects should be implemented as one package, given GoV budgetary constraints. To do otherwise will dilute the full benefits that can be obtained from the domestic sea transport and trading systems.

38. In other words the full safety and efficiency gains from new maritime infrastructure in Port Vila and the outer islands need be complemented by the proposed improvements to the policy, regulatory and institutional framework. If sub projects or components are allowed to be peeled off or undertaken in an ad hoc fashion, then the potential benefits from the reforms to the Vanuatu maritime sector will at best be diluted and at worst non-existent. All recommendations, therefore, should be implemented in a coordinated manner as one project.

39. Reforms to financial, legal and institutional systems are urgent and should be non-negotiable, as is support to outer-island shipping routes. However, should funds be insufficient for complete and immediate implementation of all the infrastructure sub projects, the South Paray Bay wharf for domestic shipping in Port Vila should be number one priority, at an estimated construction cost of Vt 812 million [s8.7.2], and a slipway should be proceeded with at an estimated Vt 152.1 million [s8.7.5].

40. Priority should also be given to existing infrastructure requiring urgent repairs while those sub-projects without associated revenue should be considered in line with the GoV's ability to support future loan repayments; [s8.7.4 to s8.7.9].

41. Furthermore, a program of regular but minimal price adjustments for both international and domestic wharves should be implemented to improve the GoV fiscal position when loan repayments commence [s8.8], and the Government should seriously consider other revenue-raising actions, such as debt recovery on tariff defaulters, and the selling of the government-owned Northern and Southern Stars.

IV. Social and Environmental Impacts

Environmental Impact:

42. The Initial Environmental Examination (IEE) for South Paray Bay concludes that all of the environmental impacts that have been identified are either of little consequence or can be safely mitigated. Building a domestic wharf as proposed will not result in any direct significant adverse environmental impact. The Environmental Management and Monitoring Plan for South Paray Bay Wharf [Appendix 3.6] shows that all potential environmental concerns can be adequately mitigated and monitored. Likewise the IEE for the Outer Island Jetty sub project (Loltong as a representative site) concludes that constructing the proposed jetty will have few adverse impacts, all of which can be mitigated.

43. All infrastructure designs have undergone an environmental impact assessment, which includes climate change mitigation strategies. The specifications for each wharf/jetty have been developed in accordance with advice from the Intergovernmental Panel on Climate Change and include an allowance for a 0.2m rise in sea level over the next 50 years.

Social Impact:

44. Inter-island shipping services to and from the outer island areas are perceived as being infrequent, unpredictable and unreliable. This low level of service has a negative impact on agricultural production in remote outer-island communities. More frequent and especially more reliable shipping is perceived as a key to stimulating increased production of cash crops, thereby contributing directly to economic development in these areas. Infrequent and unreliable shipping services impact negatively on rural people's access to basic services such as education and health and is cited as a major cause of poor school attendance. Outer island communities consider that jetties and a storehouse would support local economic development and that there is general dissatisfaction with the practice of lightering cargo and passengers.

V. Economic Evaluation of Infrastructure Subprojects

45. Economic rates of return on infrastructure sub-projects range from 29.5% (Port Vila) to 17-12% for outer island jetty construction. Economic benefits from the proposed projects include induced agricultural development (Vanuatu's natural resources are significant but poorly utilised); reduced cargo loss and spoilage through access to jetties; and enhanced access to markets and service delivery in rural areas.

46. While the sub-projects have been analysed separately for their economic rates of return, the complementary nature of the design means that the economic benefit to Vanuatu from implementation of the whole programme will likely be greater than the sum of the component parts.

47. Additional benefits from the maritime safety reform sub-project include reduced risk of a major maritime disaster; and the improved ability of the Ministry for Infrastructure to collect its tariffs and adequately maintain its wharves and other maritime assets.

Subproject	Province	Island	Capital Cost 2009 Prices		Economic Performance		EIRR Sensitivity Tests	
			VtM	US$M	EIRR	NPV (Vt'000s	Capital Costs +10%	Total Benefits -10%
Port Vila Inter-island Wharf	Shefa	Efate	812.40	8.12	29.5%	1,783.9	27.3%	27.0%
Waisisi Jetty	Tafea	Tanna	181.78	1.82	17.2%	127.39	15.7%	14.0%
Lolowai Jetty	Penama	Ambae	181.78	1.82	14.0%	75.08	12.9%	11.6%
Port Sandwich Jetty	Malampa	Malekula	181.78	1.82	14.1%	75.29	12.8%	11.5%
Loltong Jetty	Penama	Pentecost	181.78	1.82	12.9%	51.80	11.8%	10.5%

VI. Financial Evaluation, Project Funding & Implementation

48. Funding requirements and their source for new infrastructure, rehabilitation and repairs, shipping support and capacity building are summarised in the following table [refer section 8.7].

Finance Plan: Summary	*Loans*		*Donor*					*GoV*				
	Draw Down		*Technical Assistance*									
Year (Units: 000s)	*2010*	*2011*	*2010*	*2011*	*2012*	*2013*	*2014*	*2010*	*2011*	*2012*	*2013*	*2014*
Total New Infrastructure	1,303,354	373,565										
Total Rehabilitation & Repairs	705,375											
Total Shipping Support			7,273	7,273	7,273	7,273	7,273	4,400	4,400			
Total Capacity Building			95,995	75,832	28,200	18,600	18,600	10,000	10,000	10,000	10,000	10,000
Total All Vt 000's	2,008,729	373,565	103,268	83,105	35,473	25,873	25,873	14,400	14,400	10,000	10,000	10,000
Total All US$ million	20.087	3.736	1.033	0.831	0.355	0.259	0.259	0.144	0.144	0.100	0.100	0.100

49. The financial evaluation in chapter 8 is based on a 32 year loan with an 8 year grace period at an interest rate of 1.0% during the grace period and 1.5% over the remaining years. The results of this analysis will change depending on the amount borrowed, the amount received in grants and the amount committed by the Government of Vanuatu.

50. Only South Paray Bay wharf and the slipway have identifiable revenue to support the infrastructure projects; the repairs and rehabilitation to Simonsen, Litzlitz and Lenakel wharves plus the proposed outer island jetties have no identifiable revenue to support their sub projects.

51. With this in mind, the financial impact in 2012 on the GoV amounts to a surplus of Vt 49.2 million, that is, after taking account of cash flows from the revenue supported infrastructure, some institutional strengthening within the MIPU, tariff and debt adjustments but excluding infrastructure without existing identifiable revenue. By 2017, the year prior to the commencement of loan repayments, the equivalent cash flow surplus is Vt 59.8 million. [s 8.8].

52. Similarly in 2018 as loan repayments commence this cash flow surplus reduces to Vt 10.7 million; but is likewise conditional upon achieving increases in the international port tariff, MIPU water tariff plus improved debt recovery (but without increases in Slipway or South Paray wharf charges). If these improvements are not achieved there would be a cash flow deficit of Vt 29.3 million per year. [s 8.8]

53. The annual cash flows for the first 10 years, based on the loan terms and conditions plus a mix of donor and GoV funding, are detailed in the following table. They are shown for new infrastructure, the rehabilitation of existing infrastructure (the slipway is a new build), shipping support and capacity building initiatives for each sub project.

54. Those projects that have identifiable revenue (South Paray Wharf and Slipway and based on current service charges) generate cash surpluses of Vt 17.1 million in 2012 rising to Vt 27.4 million in 2017. When loan repayments commence in 2018, the financial evaluation shows a cash deficit of Vt 21.8 million, but reducing should ship calls increase as forecast. To bridge the operating cash deficit in 2018 the equivalent of an annual increase in charges of five percent

would be needed, however, this would directly impact on inter island shipping costs for vessels using these facilities.

Annual Cash Flows	2010 Vt000s	2011 Vt000s	2012 Vt000s	2013 Vt000s	2014 Vt000s	2015 Vt000s	2016 Vt000s	2017 Vt000s	2018 Vt000s	2019 Vt000s	2020 Vt000s
New Infrastructure											
Port Vila - South Paray Wharf			12,885	14,647	15,446	18,077	19,176	22,131	(19,318)	(19,414)	(14,226)
Loltong		(1,857)	(2,026)	(2,026)	(2,026)	(2,026)	(2,026)	(2,026)	(16,362)	(16,324)	(16,322)
Other Outer Islands (3)		(4,451)	(4,856)	(4,856)	(4,856)	(4,856)	(4,856)	(4,856)	(37,095)	(37,095)	(37,095)
Total New Infrastructure		(6,308)	6,003	7,765	8,564	11,195	12,294	15,249	(72,775)	(72,833)	(67,644)
Rehabilitation and Repairs											
Litzlitz		(536)	(585)	(585)	(585)	(585)	(585)	(585)	(4,526)	(4,526)	(4,526)
Simonsen		(704)	(768)	(768)	(768)	(768)	(768)	(768)	(20,072)	(20,072)	(20,072)
Lenakal		(176)	(192)	(192)	(192)	(192)	(192)	(192)	(5,325)	(5,325)	(5,325)
Slipway		4,148	4,200	4,244	4,672	4,728	5,168	5,236	(2,506)	(2,425)	(1,959)
Total Rehabilitation & Repairs		2,731	2,655	2,698	3,127	3,182	3,622	3,691	(32,428)	(32,347)	(31,881)
Shipping Support											
Shipping Services Support	(4,400)	(4,400)									
Shipping Coordinator	(7,273)	(7,273)	(7,273)	(7,273)	(7,273)						
Total Shipping Support	(11,673)	(11,673)	(7,273)	(7,273)	(7,273)						
Capacity Building											
MIPU Organisational Restructuring	(10,000)	(10,000)	(10,000)	(10,000)	(10,000)	(10,000)	(10,000)	(10,000)	(10,000)	(10,000)	(10,000)
Internal Audit	(13,712)										
Inventory		(11,008)	(9,600)								
Tariff Update	(4,606)										
Communication & Reporting	(7,428)										
MIPU Environment Unit	(28,713)	(28,713)									
Coordinator Shipping	(5,424)										
Law Technical	(17,511)	(17,511)									
MIPU Safety Regulator	(18,600)	(18,600)	(18,600)	(18,600)	(18,600)						
Capacity Building Total	(105,994)	(85,832)	(38,200)	(28,600)	(28,600)	(10,000)	(10,000)	(10,000)	(10,000)	(10,000)	(10,000)
Add back											
VAT from wharf revenues			2,132	2,185	2,240	2,296	2,353	2,412	2,473	2,534	2,598
Additional revenue tariffs & debt recovery		20,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000
Total funds added back		**20,000**	**42,132**	**42,185**	**42,240**	**42,296**	**42,353**	**42,412**	**42,473**	**42,534**	**42,598**
Total All Cash Flows	**(117,667)**	**(81,082)**	**5,317**	**16,776**	**18,058**	**46,673**	**48,270**	**51,352**	**(72,731)**	**(72,646)**	**(66,927)**

Introduction

1. This study, Phase II of the Vanuatu Inter-Island Shipping Support Project, follows on from the previous Phase I study carried out in early to mid 2008. The Government of Vanuatu's overall objective is to see that safe, efficient and sustainable inter-island shipping services are provided in order to support long term sustainable economic and social growth in the rural or outer islands (viz outside of Port Vila and Luganville). The aim of Phase I was to: (i) review the current situation in the inter-island shipping sector; (ii) identify and analyse current constraints and inefficiencies, future trends; and (iii) examine options for addressing these. The output of the Phase I study was to provide sound information to enable consensus to be reached on the preferred options for the provision of safe, efficient and sustainable inter-island shipping services throughout Vanuatu that will contribute to sustainable economic and social development, especially in rural areas.

2. The overall objective for Phase II is essentially unchanged from Phase I - to improve the safety and efficiency of the Vanuatu shipping sector, thereby enhancing economic and social development of Vanuatu and improving the delivery of shipping services to outer islands. The planned outcome for Phase II is consensus on a design document detailing potential support and reform measures to the Vanuatu domestic shipping sector.

3. The outputs of Phase II are stated as being:

(i) a comprehensive design document for a potential ensuing project approved by the Vanuatu Government (GoV), which will include:

- a legislative review of the shipping sector,
- institutional improvements;
- a technical, economic and social assessment of potential infrastructure needs, and if justified, conceptual engineering plans for infrastructure proposals including repairs and rehabilitation of existing infrastructure; and
- an engineering feasibility study and plans for publicly-owned infrastructure proposals, including repairs and rehabilitation of existing infrastructure; and

(ii) a shipping support scheme for routes to outer islands that are not commercially viable.

4. The idea is that the design document will be used by the GoV, NZAID and Asian Development Bank (ADB) to decide upon future action, financing mechanisms and contributions. NZAID undertook to be the coordinating donor for Phase II, with the expectation that this donor responsibility would rotate for additional phases.

5. Nine specific tasks were prescribed for Phase II as follows:

I. Finalize the detailed institutional, technical, economic, financial, environmental, and social analyses required to prepare a project design document suitable for consideration by the GoV, NZAID and ADB to improve the safety and efficiency of domestic shipping services.

II. Prepare the design of a scheme to support to shipping services on agreed routes that are not commercially viable, including institutional and governance arrangements along with planning and financial management procedures. Draft guidelines and procedures for its operation and assist GoV begin implementation. Identify the financing required to implement the Vanuatu inter-island shipping support scheme and its component parts and prepare a five-year financial analysis.

III. Prepare a financing plan including proposed grants or loans, prospective co-financing, and appropriate counterpart funds.

IV. Further investigate, analyse and report on the need for any infrastructure improvements or development both within and outside of Port Vila and draw up recommendations.

V. Prepare appropriate engineering designs, specifications, and cost estimates for proposed maintenance and rehabilitation programmes for existing publicly owned

infrastructure (viz wharves, slipway, navigation aids), and for any new infrastructure improvements or developments within the public sector.

VI. Analyse the likely economic, social, poverty, and environmental impacts of the overall project and its component parts in sufficient detail to determine whether each component and the overall project meets relevant safeguards and to allow design and cost estimates of mitigation measures. Recommend options to address these issues, including involvement of NGOs or CSOs, if appropriate.

VII. Review the institutional requirements of government agencies responsible for domestic shipping to streamline and improve policy development, legislation, planning, administration and management; to improve the safety and economic requirements and performance of domestic shipping. Prepare an institutional capacity development framework.

VIII. In addition to these specific project tasks prepare a draft final report and final report comprising the design document detailing potential support and reform measures to the Vanuatu domestic shipping sector.

IX. On a regular basis and as appropriate provide the GoV, NZAID and the ADB with progress reports that summarize matters pertaining to or affecting the aims, outcome or outputs of the project.

6. Initially there was some discussion between the Project Team, NZAID and the ADB about individual tasks and their associated level of detail. There were questions over the scope and emphasis of Phase II and whether private sector maritime infrastructure was included for infrastructure improvements or whether this was to be limited to public sector infrastructure. At the conception report stage these questions were (mostly) clarified. Subsequently it was agreed that preliminary engineering designs for maintenance, rehabilitation and capital investment for public sector infrastructure and for the rehabilitation of navigation aids would be sufficient. The need for conceptual engineering designs, specifications and costs for privately owned wharves, jetties, etc has been removed. However, it would still be necessary to report on the condition of all wharves and similar landside infrastructure currently in use to support domestic shipping. It was also agreed that the Project Team select two representative sites for an evaluation of the transport and trading, engineering, economic, environmental and social requirements for each. One site to be in Port Vila and the other in the outer islands.

7. Phase II is essentially a ‘design document’ that builds on Phase I by taking the options or suggestions for improving the inter-island shipping sector by making specific suggestions for removing some of the identified constraints and for improving the efficiency and effectiveness of the overall domestic shipping sector. It is emphasised that Phase II is a conceptual design document and not a strictly feasibility study, although both the wharf and jetty designs and the economic efficiency address matters of feasibility. The point is, while the suggested shipping support measures, legal requirements and institutional arrangements can be directly implemented, specific wharf and jetty (subprojects) will require detailed design, costing and appraisal. Phase II nevertheless points to subprojects that either require immediate and urgent attention or their overall benefits to the people of Vanuatu merit implementation.

8. The Project Team was engaged by the ADB and NZAID and comprised:

Charles Adamson	environmental specialist
David Hill	economist
Michael Murray	institutional and regulatory specialist
Mark Oxley	maritime operations specialist
Sally Rynveld	social and poverty specialist
Fred Salisbury	port engineer
Alex Wilson	financial management specialist.

Individual team members were from Australia, New Zealand and the United States. Markmon Batie, manager maritime affairs with the Vanuatu Ministry of Infrastructure and Public Utilities, who has considerable knowledge and experience the Vanuatu maritime system, was seconded to the Project Team as the ‘local consultant’. He played an important part in the management and conduct of Phase II. Michael Murray was team leader and David Hill the deputy team leader.

9. The Project Team reported to the Director General Ministry of Infrastructure and Public Utilities and maintained regular contact with NZAID (through their Port Vila post and teleconferences) and with the ADB (through teleconferences and an ADB mission in mid way through the job). A Project Steering Committee of senior government officials was formed to enable difficulties to be quickly addressed and to ensure there were no surprises in both the conduct of and output from the Project. Weekly meetings were also held with the Director General Ministry of Infrastructure and Public Utilities by the Project Team including Markmon Batie. The Project Steering Committee early on proved to be helpful in progressing matters concerning the representative site selected for Port Vila.

10. As with Phase I, the Project Team was confronted with the normal lack of information, documentation and official records – the records of the disbanded Vanuatu Maritime Authority were still unavailable. Notwithstanding this, however, and because of the ground covered in Phase I plus the in-country experience of two team members (David Hill and Sally Rynveld) the Project Team managed to assemble sufficient information to be able to reasonable evaluations and assessments. David Hill, in particular, managed to unearth previous studies, some of which proved to be most useful. Phase I findings were heavily relied upon even though its data and information were estimates from a variety of sources. The Phase I report noted that "the [Phase I] study team considers these figures to be reasonable, their accuracy cannot be vouched for". The Phase II Project Teams likewise considers the quantitative information and analyses to be based on reasonable.

11. The team began to arrive in Vanuatu late May 2009 and by early June the core team had mobilised. At the end of September the core team demobilised with the environmental specialist and the social and poverty specialist remaining to inspect two additional outer island sites in order to complete their examinations and assessments.

12. The report consists of two volumes: the main report and the appendices.

Main Report comprises eight chapters that cover the eight of the nine tasks (the ninth being need for progress reports that were regularly provided to the MIPU, NZAID and ADB while the Project Team were resident in Vanuatu. Each chapter deals with a discrete part of the project, the idea being to facilitate implementation for the executing agency. At the beginning of each chapter there is a summary of the main issues and conclusions. The eight chapters cover:

Chapter 1 *Domestic Shipping Support Schemes*: describes two schemes that are complementary: a shipping services support scheme that is designed to have min impact on the private sector lead domestic shipping market; and, a shipping coordinator scheme designed to assist remote outer island communities with the coordination of their shipping requirements and promotion of local production.

Chapter 2: *Infrastructure Requirements*: identifies future berth requirements at Port Vila and Luganville, the condition of the present maritime infrastructure and the future requirements, including a concept berth, for wharves at Port Vila and also for outer island jetties.

Chapter 3: *Wharf and Jetty Design and Costs*: details preliminary design standards for a representative wharf for Port Vila with barge landings plus back up land, and similarly for the outer island representative site: both to accommodate trends in vessel sizes, cargo and passenger operations and environmental factors.

Chapter 4: *Social Impact*: assesses matters concerning rural life, health, education, poverty and family requirements in outer island communities as well as their urban connections in the context of improved inter-island shipping services.

Chapter 5: *Economic Assessment*: appraises the overall benefits, from the viewpoint of the people of Vanuatu, for the various subprojects: the wharf proposed for Port Vila, representative jetties for particular outer island locations ad the shipping support scheme.

Chapter 6: *Legal Requirements*: reviews Vanuatu's present maritime legal framework and considers what is needed to fulfil its obligations and responsibilities as a party to a number of international maritime law instruments to support its maritime industry interests, both international and domestic, with the emphasis on the economic (transport) requirements as well as the safety requirements.

Chapter 7: Institutional Arrangements: assess the effectiveness of present institutional arrangements within the Ministry of Infrastructure and Public Utilities to adequately carry out the role, functions and tasks allocated to the Ministry; and inturn, propose arrangements for improving its capability and capacity; in particular policy advice, economic requirements, safety requirements and the provision of marine services.

Chapter 8: Financial Management: assesses the Ministry of Infrastructure and Public Utilities' financial management systems, matters of governance, the adequacy of financial policies and procedures and risks; and, evaluates the financial performance of the infrastructure sub projects plus the shipping support scheme.

Appendices deal with matters of detail relating to particular assessments, examinations designs or else elaborate on discussions or viewpoints presented within a particular chapter. There are 26 appendices that are numbered in sequence within a chapter and prefixed by the chapter number.

13. A draft report was distributed in separate parcels electronically 11-13th November 2009. Comments were received from the ADB on 11th December, Ministry of Infrastructure and Public Utilities on 23rd December 2009 and NZAID on 14th January 2010. Most of these comments were incorporated into the draft final report or responded to separately. A provisional draft final report was prepared in anticipation of a briefing to some Ministers, Directors General, political advisers and senior officials by the team leader and deputy team leader in Port Vila on 15th February 2010. In the same week matters of detail and specific suggestions were discussed with the Director General Ministry of Infrastructure and Public Utilities and senior managers within the MIPU and Department of Ports and Harbours as well as the State Law Office. The draft final report was distributed late March 2010. Subsequent comments arising from the draft final report have been incorporated into the final report, as appropriate.

1. Domestic Shipping Support Schemes

In Phase 1 of this project a shipping services support scheme and a shipping coordinator scheme were recommended to improve shipping services to remote communities in the outer islands. This chapter details the operation and administration of such schemes.

The domestic shipping support scheme is designed to be flexible in order to cope with market fluctuations as well as provide support as and when needed. The main issues surrounding shipping services to some remote communities with small populations are that:

- **services to and from these locations earn too little revenue from cargo and passengers to make frequent services financially viable; consequently;**
- **shipping services to remote communities and other outer islands are unreliable, irregular and infrequent; and that**
- **while desiring improvements in ship calls these communities tend to produce only sufficient cash crops to meet their immediate needs.**

It is recommended a domestic shipping support scheme be established that:

1. **comprises a shipping services support scheme, administered by the Ministry of Infrastructure and Public Utilities (MIPU), to increase the number of ship calls to remote communities together with a shipping coordinator scheme to coordinate the aggregation of cargo and passengers and to disseminate shipping information to, in turn, promote market access for remote island communities; [refer section 1.1 7 section 1.2.]**
2. **integrates these two schemes so that shipping services are provided in response to a need established by the shipping coordinator; [s 1.2.2]**
3. **has minimum impact (market intervention) on the domestic shipping market, which is a private sector operation, and to this end ship calls be determined by the market; [s1.1.4]**
4. **provides support on a voyage-by-voyage basis until shipping services to these remote communities become commercially viable; [s 1.1.4]**
5. **provides at least four ship calls annually to each of:**
   - **(i) Aniwa, Aneityum and Futuna**
   - **(ii) West Santo, and**
   - **(iii) Big Bay (Santo); [s 1.1.2]**

6. consists of a coordinator based in Port Vila (to be appointed by the MIPU) and eight on-site local coordinators in remote communities (to be appointed by their local communities); [s1.2.4-6]

7. provides for a capacity building specialist (to be supported by a donor) at the start to assist in establishing the shipping awareness programme and communications network; [s 1.2.4, s1.2.7]

8. monitors (*ie* coordinator) shipping services, especially to outer island remote communities where services are inadequate or barely adequate; [s 1.2.5, s 1.2.6 and that

9. the shipping coordinator scheme be initially supported for two years by the Government of Vanuatu with donor assistance and then reviewed. [s 1.2.16]

The estimated annual cost of operating the shipping coordinator scheme is USD129,000 for the first year and USD73,000 in subsequent years [s 1.2.17] – the shipping services support scheme could cost up to USD88,800 over two years if local production does not increase and cargo volumes do not materialise [s 1.1.14]

1.1 Shipping Services Support Scheme

1. One of this project's requirements is to design a shipping services support scheme for isolated communities on routes deemed to be not commercially viable, and to prepare draft guidelines and procedures as well as a monitoring and evaluation framework.

2. The Shipping Services Support Scheme arises from the analysis and recommendations of the NZAID funded Vanuatu Inter-island Shipping Study Phase I in 2008 (VISSP1), which proposed the development and implementation of a scheme to assist private sector ship operators provide services to routes and locations not otherwise commercially viable.[1] The unprofitably of these routes is due to a mix of distance and insufficient volumes of cargo and number of passengers. In turn, the low level of shipping services does not promote increased production above subsistence requirements.

1.1.1 The Matter of Subsidies

3. Subsidies are vulnerable to abuse and produce externalities, and therefore must be carefully designed in order to achieve the desired result. A characteristic of subsidies is that they have unintended consequences and rarely provided the desired outcome. In order for subsidies to have any chance of success it is necessary to be absolutely clear at the outset what the subsidy is intended to achieve. Four key aspects in the design of subsidies need to be considered – and in order:

- Who are the *intended beneficiaries*?
- What *type* of benefit do they need, e.g. income enhancement, lower effective prices, increased consumption?
- *How much* benefit or subsidy is to be received by the beneficiaries?
- What is the best or most appropriate *delivery mechanism* to ensure that the intended benefits, in the intended amounts, are actually received by the targeted beneficiaries?

4. Unless these key aspects in the design of subsidies are considered and answered with precision and confidence, the process will be overtaken by arbitrary or reactionary decisions clouded by political or subjective interference and short run budgetary considerations.

[1] *Vanuatu Inter-island Shipping Study Phase I, Final Report, 27th June 2008: McGregor & Company.*

5. In the context of inter-island shipping the *intended beneficiaries* are the people living in remote communities on outer islands. The *type of benefit* required is one that leads to sustainable economic and social development. On the question of *how much* benefit is needed the answer simply is an amount that leads to sustainable economic and social development. The most appropriate *delivery mechanism* is a minimum number of ship calls to induce surplus production given natural, labour, and capital resources. The threshold level of shipping services is considered to be at least four ship calls per year, or equivalent to one ship call every three months.[2] The best method of delivery is the one that causes the least or minimal interference in the domestic shipping market, which is lead by the private sector.

6. A number of support measures were considered in VISSP1 analysis.[3] Regardless of whatever support measures are used, such as subsidies, any market intervention should be viewed as a "hand up" rather than a "hand out". Furthermore, any market intervention should have an exit strategy to be designed as a temporary measure of support allowing the intended beneficiary to adjust to or overcome the immediate hardship, rather than becoming an ongoing "hand out" payment requiring no effort by the beneficiary to improve the situation. In general, an observed trend has been that the longer a support measure exists, the greater the probability the benefit will be diverted or siphoned off to those others than the intended beneficiaries. So that over time its intended purpose becomes lost and the support measure or subsidy hijacked or misdirected.

7. In VISSP1 it was concluded that the most appropriate and by far the best method of delivering the subsidy is to support particular voyages on a voyage-by-voyage basis. Thus inviting bids from ship owners and operators to provide such voyages on a commercial basis would provide transparency and be indicative of the necessary incentive payment or "revenue top-up" needed for a willing shipping services operator or bidder to make the voyage.

1.1.2 Routes for Potential Support

8. During VISSP1 as a result of visits to remote locations, and extensive consultation and analysis of shipping services, several places and routes were identified as having inadequate or unsatisfactory shipping services as follows:

- Torres Islands,
- some islands in the Banks,
- communities in West Santo and Big Bay on Espiritu Santo,
- East Pentecost,
- East Maewo, and
- outer islands in Tafea Province.

9. The minimum frequency of a ship call was assessed to be once every three months.[2] Of the above places, the following did not receive a ship call every three months and thus were considered to need support:

- Torres Islands,
- some islands in the Banks, notably Ureparapara, but possibly also other smaller islands, and
- outer islands in Tafea Province, excluding Tanna.

[2] VISSP1 – see Section 2.1, page 19. This is primarily based on the maximum time copra can be stored before it deteriorates and has no commercial value. Any shorter period between ships would not enable sufficient cargo to be accumulated and the financial risk for the ship owner would be higher. To begin with a more frequent number of ship calls would not result in more produce for market, but rather would require a higher subsidy. As communities begin to have more confidence in the shipping services, then more produce is likely to be grown; and as both the volume of cargo and the freight revenue increases, whereby the necessary subsidy amount will become less or the level of service increases, or both.

[3] In VISSP1 several methods were considered for delivering subsidies. In particular a method used often in Pacific developing countries involving a long-term contract specifying a service standard and frequency was given close attention. This type of arrangement, sometimes called a "franchise scheme", may work well in places where there is a major degree of governmental involvement and few operators. It is, however, complicated for ship operators to understand and high on administrative, monitoring and evaluation costs. Such a scheme was judged inappropriate for Vanuatu, where there are a many private sector operators and effectively no governmental involvement. As such a simple scheme was assessed to best the best fit for the purpose.

No other specific support for other places were assessed as being needed, including East Pentecost, Easy Maewo and Tanna.

10. In addition there was a need for some type of shipping coordination support in isolated communities in West Santo and Big Bay on Espiritu Santo as well as locations and routes identified above as needing shipping services support scheme. A shipping coordinator scheme has the potential to be the link between users and providers of shipping services and to assist in matching the supply and demand for shipping throughout Vanuatu. It can also assist with improving the *quality* of shipping services, such as *regularity* and *reliability* of schedules, out-turn of cargo, passenger comfort, etc, rather than just the *quantity*. Thus there is a place for two schemes; a shipping services support scheme, which addresses *quantity*, and a shipping coordinator scheme that addresses the *level* of services.

11. In the intervening 14 months since the VISSP1 analysis and review, there have been changes in the provision of domestic shipping services within Vanuatu. The following islands are now reported to be receiving services to the level perceived as adequate:

- Torres Islands,
- islands in the Banks that were not previously receiving adequate service such as Ureparapara, and possibly the other smaller islands, and
- Erromango in the south.

12. However, communities in West Santo and Big Bay, on Espiritu Santo, where the service levels are now likely to be below the acceptable threshold of at least one ship call every three months need to be considered for shipping services support.

13. Thus, the list of islands now needing shipping services support scheme includes:

- outer islands in Tafea Province (Futuna, Aniwa, Aneityum), and
- communities in West Santo and Big Bay on Espiritu Santo.

14. As witnessed, the market is fluid and communities justifying support are likely to change over time. Any support scheme therefore needs to be flexible. For example, people who live on the eastern side of Tanna, at places such as Port Resolution and White Sands (Waisisi) ship their goods via Lenakel on Tanna's west coast. This costs up to Vt10,000 per tonne for inland transport, swamping the sea freight from Port Vila of only Vt7,000 per tonne. A voyage-based shipping support scheme could encourage ship operators to call at Port Resolution, in this example, yet retain the flexibility of being able to call off support, once or if the voyage becomes commercially viable.

1.1.3 The Basis of Shipping Services Support Scheme

15. The underlying assumption of domestic shipping in Vanuatu is that regular and reliable services will provide steady access to markets and thereby encourage increased production to generate surplus goods for sale in those markets rather than simply produce what is needed for local consumption. The existing shipping services accomplish this for an estimated 98% of the rural population. However, the remaining 2% of the rural population, in the places identified in paragraph 13 above, do not have enough cargo and passenger volumes for voyages to be financially attractive to ship owners and operators. These isolated communities all have unused productive capacity that could be tapped if adequate shipping services were available. The shipping support scheme is designed to bring them the regular and reliable services they need to promote economic development.

16. The view and expectation is that, because of such support, cargo volumes will grow during a period of supported voyages. In parallel, the financial support needed by ship operators will reduce commensurate with the increased cargo and passenger numbers to the stage where it is expected that ship operators will make voyages of their own accord, unsupported by a subsidy from the GoV. At this point, the shipping services support scheme will become dormant only to be resurrected in the event shipping services reduce to previous levels.

17. It is envisaged that at least six supported voyages to a community will be needed before services become commercially viable, which equates to 15-18 months elapsed time. However, the length of time and number of subsidized voyages before a service to a particular community becomes commercially viable is difficult to assess as it will depend on a number of factors. Prime amongst these will be the success of the shipping coordinator scheme to promote local production and in turn

the build up of cargo to entice a ship to make a call on its own account. From ship operators' points of view it is the overall voyage profitability that matters. So the decision to make a call at a particular location is likely to depend on the contribution to the voyage calls at other nearby locations the ship would otherwise make. The response of the community to the availability of regular and reliable shipping services on local production is also likely to vary from location to location. It could be up to three years or even more before shipping services to some locations become commercially viable. Alternatively some places may increase copra production straight away, resulting in no more than three or four supported voyages, over six to nine months. The financial analysis has assumed an 18 month period of support for each route.

1.1.4 Elements of the Scheme

18. The shipping services support scheme will take the form of a contract between the GoV and a ship operator whereby the ship owner or operator undertakes to visit particular places within a specified timeframe to deliver and uplift cargo and carry passengers. In consideration of the service provided, the ship operator receives a lump sum payment. Part of the payment is in advance with the remainder in arrears adjusted according to the conduct of voyage compared with the contractual obligations.

19. There are five elements to the scheme administration:

Element:	*Person Responsible:*
1. Pre-qualification of ship owners	Shipping Coordinator
2. Assessment of requirement for a voyage	Shipping Coordinator
3. Scheme approvals and payments	DG MIPU
4. Tender and contract process	Shipping Scheme Administrator
5. Monitoring and evaluation - feedback loop	Shipping Scheme Administrator, & Shipping Coordinator

20. The scheme is intended to make the process transparent, so that it can be perceived as being fair, and to minimize or avoid opportunities for malfeasance or corruption.

21. *Figure 1.1* is a flow diagram of the Shipping Services Support Scheme processes. Guidelines for the scheme are detailed in *Appendix 1.1*.

1.1.5 Pre-Qualification

22. Ship operators who may wish to participate in the shipping services support scheme shall apply to the Shipping Coordinator for pre-qualification for their ships. The Shipping Coordinator shall check the factual statements, and provided there are no errors or omissions, shall place the applicants on the pre-qualified list, and advise the operator.

1.1.6 Assessment of Requirement for a Voyage

23. Assessment for the need of subsidized voyages is one of the roles of the Shipping Coordinator, as described in Section 1.2.6. The Shipping Coordinator will monitor the levels of shipping services to the outer islands. Then, when a location appears to need scheme support the Shipping Coordinator shall advise the Director General (DG) of the Ministry of Infrastructure and Public Utilities (MIPU) of the requirement.

1.1.7 Approvals and Scheme Payments

24. The responsibility for deciding on voyage support shall reside with the DG MIPU. Upon receipt of advice from the Shipping Coordinator, or for any reason the DG considers that a voyage is

required, the DG shall authorize the voyage support and instruct the Shipping Scheme Administrator to call a tender.

25. Once a tender contract has been awarded, the DG shall authorize an initial payment to the ship operator according to the provisions of the contract. After the voyage has been completed and upon receipt of advice from the Shipping Scheme Administrator that the contract performance is in compliance with the contract, the DG shall authorize the balance of support payment. The MIPU will have the responsibility for making scheme payments and so will require appropriate accounting procedures to be established.

1.1.8 Tender and Contract Process

26. The GoV shall be represented by a Shipping Scheme Administrator, who should be an accounting firm selected and contracted to carry out this role. This is to avoid as best possible, any opportunity for corrupt practices when evaluating and awarding the contract, and to enable impartial administration and enforcement of contract provisions and payments.

27. The Shipping Scheme Administrator shall issue an invitation to tender to ship operators, who have registered in the scheme by pre-qualification, by advertising with direct email, in newspapers and other media. Upon receipt of tenders, the Shipping Scheme Administrator shall assess the tenders. The assessment shall include checking that the ship is suitable for the task by a comparison with the pre-qualification data. The successful bid shall be that whose bidder who has the lowest tender for a prequalified ship and whose pre-qualification data matches the call for tender requirements with respect to cargo and passenger capacity and survey status for the voyage specified in the call for tenders.

28. The Shipping Scheme Administrator shall advise the DG of the successful bid. The DG shall decide whether or not to proceed. If the decision is to proceed, the DG shall instruct the Shipping Administrator to proceed, and advise the Shipping Coordinator that a voyage is to be carried out. The DG does not need to give a reason for deciding not to proceed. The Shipping Scheme Administrator, representing the GoV, shall award the contract to the successful bidder.

29. The successful bidder will undertake the voyage. There is no further negotiation. The contract terms and conditions are stated in the invitation to tender. The successful bidder is obliged to accept the contract.

30. At the end of the voyage the successful bidder shall submit a voyage report to the Shipping Scheme Administrator in order for the Administrator to assess compliance with the contract and in turn advise the DG of the amount that is to be paid to the ship operator. A copy of the voyage report will also be furnished by the Shipping Scheme Administrator to the Shipping Coordinator for monitoring purposes.

1.1.9 Monitoring and Evaluation - Closing of Loop

31. There are three monitoring requirements to:

- ensure that the voyage is conducted according to requirements of the contract, which will be checked by the Shipping Scheme Administrator (see above);
- record voyage, cargo and passenger information on the MIPU's database for domestic inter-island shipping to assist in ascertaining or establishing the need for shipping services support, which will be facilitated by the Shipping Coordinator; and
- assess the effectiveness of scheme in fostering social and economic development and in terms of changes in quality of shipping services, which will monitored by the Shipping Coordinator.

32. The Shipping Coordinator will continue to evaluate the need for supported services under the parallel shipping coordinator scheme (refer to Section 1.2) and when one is required, the above process is repeated.

1.1.10 Conduct of Voyage

33. Invitation to bid and the voyage contract will specify:

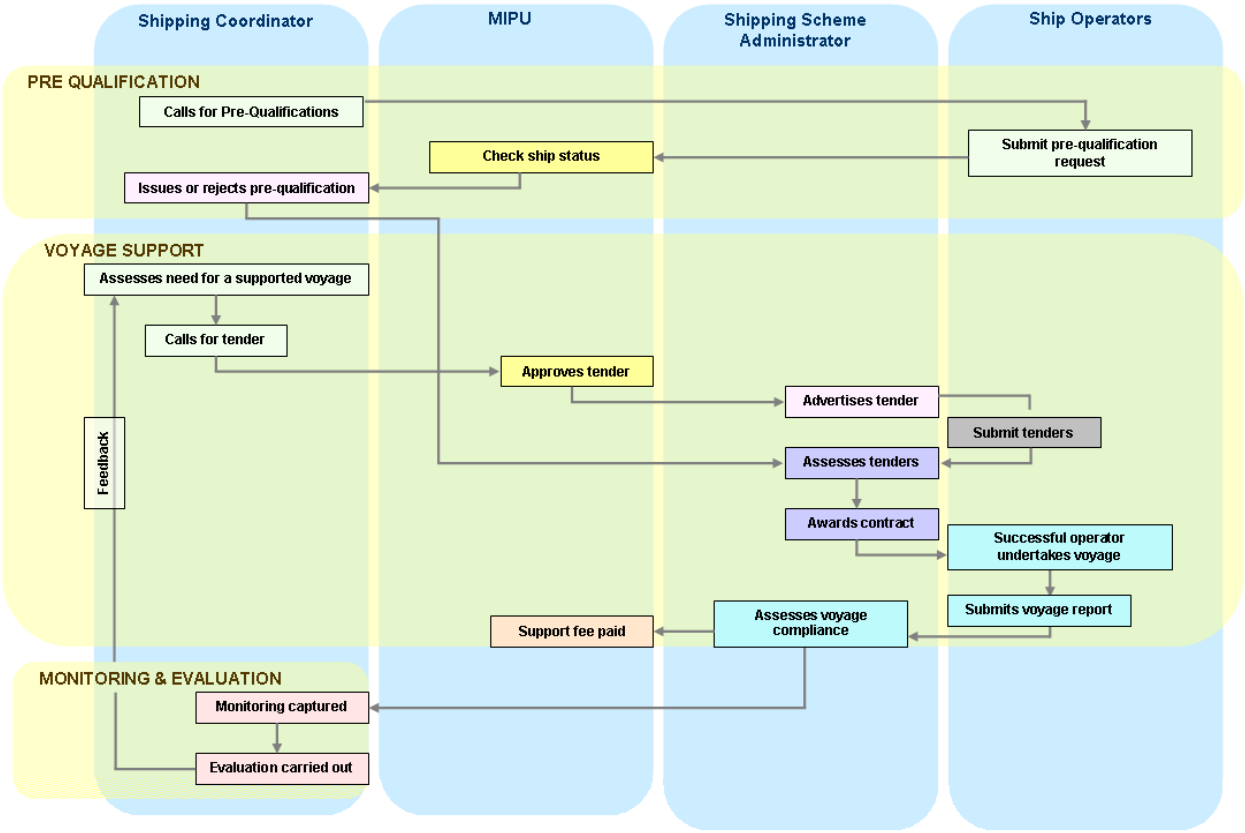
- Vessel;
- Location to make ship calls;
- Amount of cargo and passenger space to be available for cargo and passengers to and from the specified places;
- Order of calls;
- Voyage ready date range;
- ETD from origin port; and
- ETA for arrival back at return port.

34. The ship will undertake the voyage and will:

- Present load-ready at the start port;
- Load cargo and embark passengers;
- Depart on the voyage, and visit each named place, and, at the ship operator's option, potentially others;
- Discharge and load cargo, and disembark and embark passengers at each place; and
- Return to the return port.

35. All revenue shall remain with the ship operator. Deviations from obligations will result in payment reductions according to the contract's provisions.

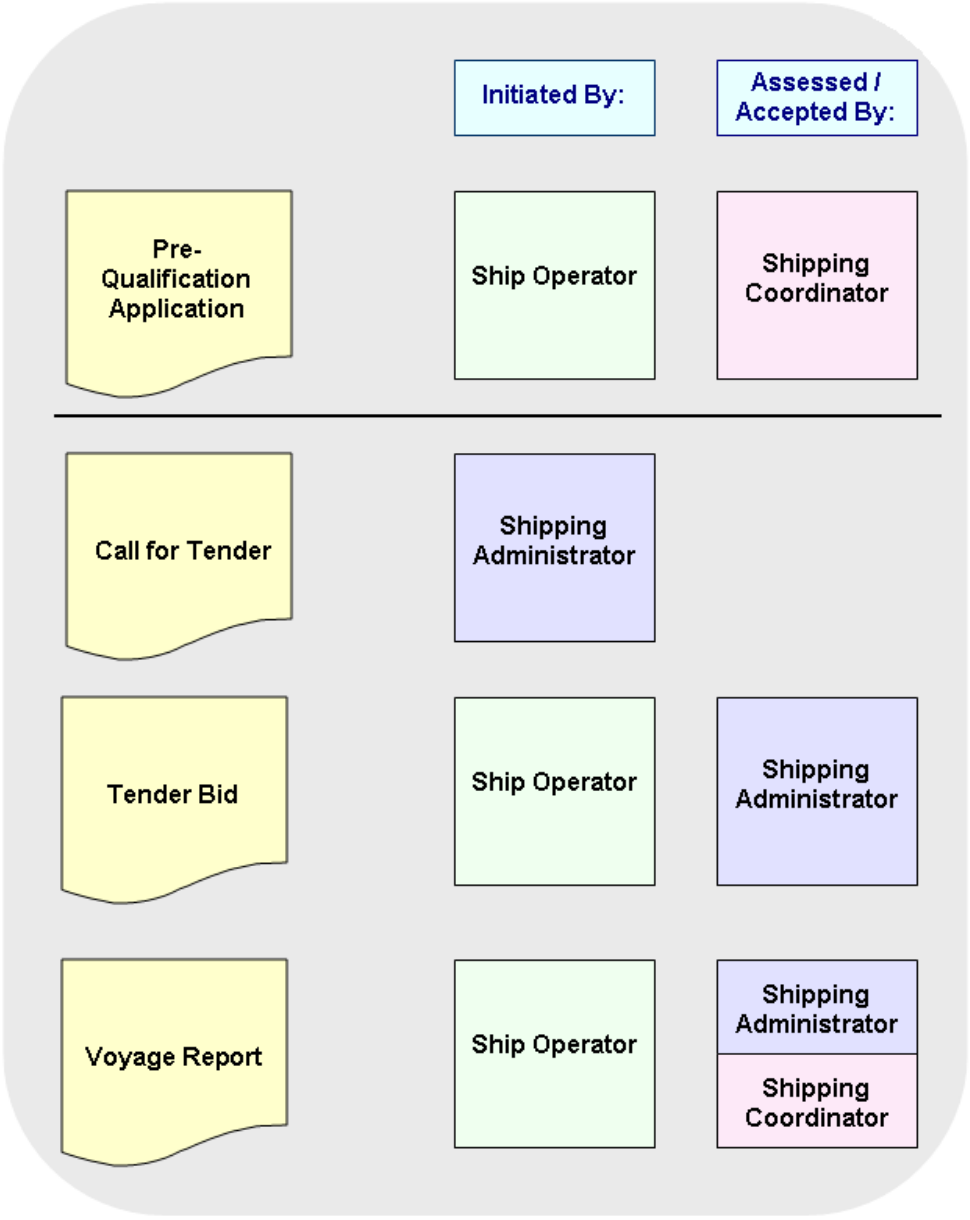
Figure 1.1: **Shipping Services Support Scheme – Process Diagram**



1.1.11 Documentation

36. The documentation needed for the shipping services support scheme consists of four documents or records, which are illustrated in *Figure 1.2*

Figure 1.2: **Shipping Services Support Scheme Documents**



37. In addition the Tender Guidelines in *Appendix 1.1* set out the purpose of the shipping services support scheme and describe the pre-qualification and tender process, the conduct of voyages, payments, general conditions of tender and the process for monitoring the conduct of voyages.

38. The four documents or records are:

- *Prequalification Record*: is an application form to enable ship operators to apply for pre-qualification for their ships. The pre-qualification requires only that a ship is registered and in survey. At the time of contracting, the ship will also be required to be manned, and otherwise operated in accordance with the requirements of the appropriate legislation and regulations.
- *Call for Tenders*: is a document inviting persons or entities to bid for a specified voyage. The document will contain details of the intended voyage, the bid procedure and format, the contract that will be awarded to the successful bidder, and other information necessary for an open and transparent bid process.
- *Tender Bid*: the document by which a bidder submits an offer.

- *Voyage Report Form*: is a record in a particular format to enable compliance with the contract that the ship has called at specified places, that cargo and passenger volume requirements have been met, and that the ship arrives at its return port within the time specified. Verification of the voyage performance will be by nominated persons or persons in a nominated position at specified places that the ship has called. The voyage report form is provided by the ship operator to the Shipping Scheme Administrator to enable evaluation of the level of compliance with the contract. In turn final voyage payment will be made by the MIPU, adjusted if necessary for any lack of performance. A copy of the voyage report form will be provided by the Shipping Administrator to the Shipping Coordinator as part of the latter's monitoring and evaluation data.

1.1.12 Regulatory Requirements

39. Chapter 245, Government Contracts and Tenders, of the Laws of the Republic of Vanuatu, and the Tenders Regulations, Order 40 of 1999 regulate government tenders. Any contract for supply of services to the GoV, which is paid for out of public funds comes under these rules. If the consideration for the services is less than Vt5 million the contract is, however, not a Government Contract that is required to come under the procedures of those rules.[4] As the amount of public funds for this shipping services support scheme is likely to be less than Vt5 million, the tender process may be undertaken outside of these regulations.

40. However, Chapter 245 has provision for regular suppliers.[5] If over the course of a year more than one contract is entered into in relation to substantially similar matters and the sum of the considerations exceeds Vt5 million then in a subsequent year, the provisions of these rules apply. The shipping services support scheme is not likely to amount to Vt5 million in one year, and even then, services to different places may well be sufficient for them to not be of "substantially similar matters". Regardless, the Shipping Administrator will need to bear this requirement in mind.

1.1.13 Transparency

41. The amount of the winning bid is made publically available by the Shipping Scheme Administrator, possibly with a notice in the newspaper. The pre-qualification data for all pre-qualified ships is also to be publically available by the Shipping Coordinator. In this manner, any person, whether or not a bidder, can see that the chosen ship has sufficient cargo and passenger capacity. All unsuccessful bidders will also be able to see that the successful bidder was lower than their price.

1.1.14 Financial Requirements

42. The following is a cost summary of the scheme, based on representative ships plying the identified routes, for an assumed number of shipping services support voyages in a year.

43. It is assumed that after five voyages that are three months apart (15-18 months), voyages would be commercially viable. So that the sixth voyage would not require support, *i.e.* a subsidy. This assumption may be overly optimistic or pessimistic but as noted at the outset, this will depend on the response by individual communities and the manner in which the shipping coordinator scheme is embraced by those communities. However, it can be argued that if the actual demand for regular and reliable shipping services corresponds with the reported requirements of these isolated communities, then this assumption may not be unrealistic. The locations requiring shipping services support and the type of shipping services support are detailed below:

Locations Requiring the Shipping Services Support	No. of supported voyages a year	Origin	Type of voyage
Aniwa	4	Port Vila	Deviation, via Lenakel
Aneityum	4	Port Vila	Deviation, via Lenakel
Futuna	4	Port Vila	Deviation, via Lenakel
North coast of West Santo	4	Luganville	Round Voyage
West coast of Big Bay, Santo	4	Luganville	Round Voyage

[4] See clause 2A of Chapter 245.
[5] See clause 13B of Chapter 245.

44. It is assumed that the ship's time for a supported voyage is 1.5 days for a deviation and 7 days for a round voyage.

45. The estimated required budget for supported voyages to all locations is summarized below.

	Total	Aniwa	Aneityum	Futuna	North Coast of West Santo	West Coast of Big Bay
Voyage type		Deviation	Deviation	Deviation	Voyage	Voyage
Days		1.5	1.5	1.5	7	7
Cost per day		Vt 120,000	Vt 120,000	Vt 120,000	Vt 120,000	Vt 120,000
Cost per voyage		Vt 180,000	Vt 180,000	Vt 180,000	Vt 840,000	Vt 840,000
Revenue shortfall						
1st voyage 50%		Vt 90,000	Vt 90,000	Vt 90,000	Vt 420,000	Vt 420,000
2nd voyage 40%		Vt 72,000	Vt 72,000	Vt 72,000	Vt 336,000	Vt 336,000
3rd voyage 30%		Vt 54,000	Vt 54,000	Vt 54,000	Vt 252,000	Vt 252,000
4th voyage 20%		Vt 36,000	Vt 36,000	Vt 36,000	Vt 168,000	Vt 168,000
5th voyage 10%		Vt 18,000	Vt 18,000	Vt 18,000	Vt 84,000	Vt 84,000
6th voyage 0%		0	0	0	0	0
Total support required	3,330,000Vt	Vt 270,000	Vt 270,000	Vt 270,000	Vt1,260,000	Vt1,260,000
2010	3,108,000Vt	Vt 252,000	Vt 252,000	Vt 252,000	Vt1,176,000	Vt1,176,000
2011	222,000Vt	Vt 18,000	Vt 18,000	Vt18,000	Vt 84,000	Vt 84,000
Total support required	USD 33,300					
2010	USD 31,080					
2011	USD 2,220					

46. The revenue shortfall is the financial support that is estimated to be required per voyage. This is based on the broad, potentially optimistic, assumption that for the first voyage, revenue collected from freight and passenger fares by the ship operator would cover only 50% of the total voyage costs. For the second voyage revenue collected is assumed to cover 60% of these costs leaving 40% of the voyage costs to be covered by a subsidy. For the third voyage the revenue collected is assumed to cover 70% of voyage costs leaving only 30% to be covered by a subsidy. If the amount of revenue collected on each subsequent voyage increases by about 10% of the voyage cost, then by the sixth voyage revenue would cover operating costs, including a profit element.

47. On this basis and corresponding set of assumptions, the total cost for the first year is Vt3,108,000, which is for four voyages to five geographic areas or locations. The total cost for the fifth voyage in the following year would be Vt222,000; the sixth voyages being commercially viable.

48. Thus, the overall cost of supporting shipping services to isolated communities could be at least Vt3.33 million or about USD33,300).

1.2 Shipping Coordinator Scheme

1.2.1 Phase I Findings

49. NZAID funded the Vanuatu Inter-island Shipping Study Phase I in 2008 (VISSP1). One of the primary project tasks was identification of the causes for the lack of sufficient shipping services to sustain economic and social development on remote or outer island communities. Key findings affecting domestic shipping were:

- the GoV had little involvement in the provision of inter-island shipping services;
- shipping services were generally available and required no government assistance;

- safety regulation and oversight of the maritime system was inadequate and the legal framework requires updating and streamlining;
- there is an adequate supply of shipping capacity to the domestic trade and effectively in balance with the demand for shipping services;
- approximately 10% of the population's economic and social development potential was hindered by inadequate shipping services due to insufficient cargo to attract shipping services to these points of call. Specifically:
  - 1.3% of Vanuatu's population living in remote island communities were the most adversely affected receiving less than four ship calls per year, which was deemed insufficient to sustain economic and social development; and
  - other remote island communities received at least four, but irregular ship calls with long interval periods, resulting in significant community stress and having to resort to subsistence living for basic needs until another call was made.
- four ship calls per year that were reliable and evenly spaced was considered to be the 'basic needs' threshold for isolated communities;
- there is a lack of knowledge about shipping and especially ship call times and dates within most isolated communities;
- not all remote island communities had been informed of what they needed to do to attract additional and more consistent ship calls;
- Radio Vanuatu had downgraded its broadcasting power and discontinued the service of providing information on shipping services that remote communities relied upon in previous decades; and
- telecommunication services to remote areas in Vanuatu were being implemented and could improve communication to approximately 75% of the country.

1.2.2 Complementary Roles of Shipping Services Support and Shipping Coordinator Schemes

50. There are two shipping supply and demand situations that could benefit from the complementary design and implementation of a Shipping Services Support (SSS) Scheme and a Shipping Coordinator Scheme. The first is where isolated island communities receive fewer than the "basic needs" threshold of four ship calls per annum. The second where those communities receive four or more ship calls per annum, but at irregular intervals.

51. The Shipping Services Support (SSS) Scheme is designed to resolve the first situation and provide support for a minimum of four evenly spaced ship calls per annum, weather permitting. The SSS Scheme allows for the payment of a subsidy to a ship owner, being the revenue difference between the owner's minimum cargo volume requirements for profitability and that actually carried. The SSS is a shipping supply side intervention and is a temporary arrangement until services to isolated communities are commercially viable, that is, they pay their own way.

52. As the title indicates, the Shipping Coordinator Scheme is primarily a shipping demand side program to assist in the coordination of shipping services to match the requirements of isolated communities. Specifically to:

- provide a transport and trading awareness program for isolated communities focused on what is required to attracts ship calls,
- promote local production, improved quality, and increase the availability of cargo to be shipped,
- promote aggregation of cargo,
- coordinate the timing of ship calls to improve reliability and ensure consistency of calls,
- ensure isolated communities have prior knowledge of ship calls and times,

- encourage prospective buyers of remote island produce to proceed with transactions, and to
- keep the prospective markets informed of forthcoming shipping service availability.

53. A Shipping Coordinator will undertake a lead role for both situations, ensuring the minimum number of calls for remote island communities and for communities with irregular services to ensure improved regularity. Thus, the SSS Scheme and the Shipping Coordinator Scheme complement each other; facilitating shipping supply and demand.

54. Initially, the SSS Scheme may commence operations prior to the Shipping Coordinator Scheme becoming operational. In such a case, the full benefits of both schemes will not be realized until they are operating side-by-side.

1.2.3 Overview of the Shipping Coordinator Scheme

55. Ships are attracted by cargo volumes that are sufficient to cover the costs of picking up or unloading cargo or both. Therefore remote location residents need to produce sufficient cargo volumes at regular intervals to attract ship owners into making consistently scheduled calls. The Shipping Coordinator through an awareness program targeted at specific remote island communities will inform them of the basic requirements to attract ship calls.

56. Having achieved this awareness in isolated communities and assessed the volume of products each community can produce, with assistance from communities themselves, the Shipping Coordinator will develop a network of suppliers, buyers of produce, and ship owners to complete each trade cycle.

57. At regular planned intervals, when isolated communities have aggregated their supply requirements and have produce ready for transport, the Shipping Coordinator will advise the MIPU of the need for the ship calls. In turn the Shipping Coordinator will advise remote island communities in advance of the impending ship call and the estimated time of arrival for those communities supported by the SSS Scheme.

58. The longer term objective in promoting increased production and the aggregation of cargo is to initially minimize the cost of the shipping subsidy but then to eventually phase out or eliminate the need for the SSS Scheme altogether through sustainable cargo volumes that attract commercially viable shipping services.

59. The Shipping Coordinator would establish a communication network through the Provincial Secretary's office in each province as the majority have direct radio telecommunications with each of their isolated communities. As telecommunications improve coordination via mobile phone communications can be made with each remote community and also the Provincial Secretary's office.

60. One of the major findings in VISSP1 was the lack of knowledge of ship arrival dates and times. With improved technology a voice message service could be established people can use mobile phones to find out the latest estimated time of arrival. The Shipping Coordinator will establish this system. Exactly how isolated communities will access and use the information will be determined as the Project proceeds, however, it is envisaged that mobile phone technology and a voice message system will be the main means of communication. The updating and improving the system will occur as experience is gained.

1.2.4 Identified and Target Communities

61. Three provinces qualify for the Shipping Coordinator Scheme. In these provinces there are either remote island communities receiving fewer than the "basic needs" threshold of four ship calls per annum or four or more ship calls per annum, but at irregular intervals. They are described below:

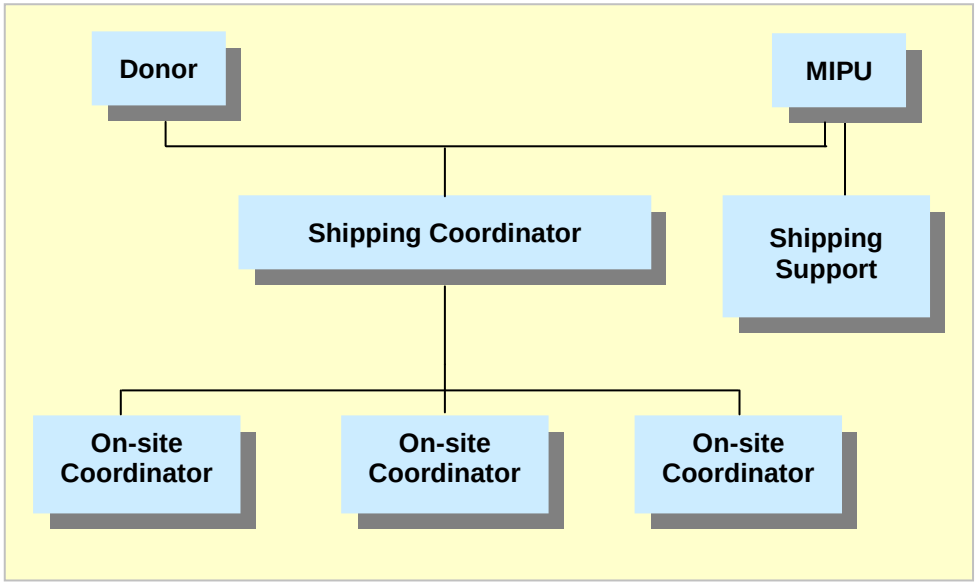
- *Tafea Province*: The islands of Aniwa, Futuna, Erromango and Aneityum qualify for the SSS Scheme. Possible support would be by diverting ships operating to and from Tanna. To these islands. The Shipping Coordinator will need to travel to these locations to establish communications, deliver awareness programs and build relationships with the communities on each of these islands.

- *Torba Province*: Some of the islands within the Torres group such as Hiu, Tagoa, Loh, Toga and Ureparapara may qualify for the SSS Scheme with round or dedicated voyages, contingent on recent developments by private sector shipping service providers who have begun regular services to some locations in Torba. Whether involved in the SSS Scheme or not, given their distance from Luganville and lack of regular shipping, the Shipping Coordinator needs to travel to these locations to establish communications, deliver awareness programs and build relationships with the communities on each of these islands.
- *Sanma Province*: The communities on the Upper West Coast and Big Bay will initially be involved in the SSS Scheme and require the Shipping Coordinator to promote regular shipping. Once again the Shipping Coordinator will need to travel to these remote locations to establish communications, deliver awareness programs and build relationships with the local communities.

1.2.5 Personnel and Communication Requirements

62. The proposed governance arrangement is illustrated in *Figure 1.3*. Nine people are required to operate the Shipping Coordinator Scheme comprising eight "On-site Coordinators" located at isolated communities and overseen by the Shipping Coordinator based in Port Vila. The Shipping Coordinator will liaise with MIPU, inter-island shipping companies, and others such as donor agencies as required.

Figure 1.3: **Organisation of the Shipping Coordinator Personnel**



63. On-site Coordinators will be selected by their local communities following the initial visit by the Shipping Coordinator who will advise the Area Councils of the procedure for selecting the On-site Coordinators in each of the identified communities. It is suggested that these persons be provided with some remuneration.

64. The On-site Coordinators will be initially stationed at the following locations: Aniwa, Futuna, Aneityum, Erromango, North West Santo, Big Bay, Ureparapara and one in Loh to cover all the communities in Torres. The Loh On-site Coordinator will travel by boat to communities in Torres to promote the objectives of the Shipping Coordinator Scheme. The Shipping Coordinator would visit each On-site Coordinator twice per annum.

65. To assist in the establishment of the Shipping Coordinator Scheme, it is proposed that short term capacity building assistance be provided to the Shipping Coordinator. This assistance would take the form of designing a sea transport and trade awareness program and helping the Shipping Coordinator establish the SSS Scheme in two or three selected isolated communities as pilot

programs. It is envisaged that these pilot programs would identify potential implementation problems and possibly improvements to the schemes.

66. With recent improvements in telecommunications over the last twelve months, only North West Santo is not within the mobile cellular network. To maintain communication with North West Santo the On-site Coordinator can use the Provincial Council's radio network for messaging and reporting. Provision has been made for a new two-way radio to replace the existing North West Santo set that was working only intermittently in 2008. However, in general, for reporting between the Shipping Coordinator and the On-site Coordinators, it is envisaged that short message service (SMS) or text messaging will be used to relay information.

67. To close the existing information gap identified in VISSP1, it is proposed to establish a message service to enable isolated communities to obtain more accurate and timely information on ship calls. The details of its costs and how the message service can be established is outlined in the cost section below. In Vanuatu telecommunications landlines are difficult to obtain and cost substantially more to operate than access to the mobile network. Therefore, mobile cellular phones have been proposed for the Coordinator, On-site Coordinators and the message service. One cell phone with a recorded message would form the basis of the message answering system. Communities interested in vessel arrivals with access to a mobile phone can call the message service to obtain the latest information on a vessel's estimated time of arrival.

1.2.6 Shipping Coordinator: Role and Tasks

68. The *purpose* of the Shipping Coordinator is, as the name suggests, to assist in the coordination of shipping requirements to isolated communities in the outer islands. In other words to facilitate both the supply of shipping services along with the demand for shipping services to foster economic and social development in isolated communities.

69. The Shipping Coordinator's *role* is to assist manage the demand side of shipping services to isolated communities, promote trade, and coordinate the provision of information and support between the isolated communities and the providers of shipping services. The Shipping Coordinator will also assist in the administration and management of the SSS Scheme.

70. The *tasks* of the Shipping Coordinator are to:

(a) establish a program of ship calls to isolated communities and to advise the DG-MIPU of the need for support under the SSS Scheme;

(b) assist the Shipping Scheme Administrator (selected accounting firm) initiate arrangements for shipping services to isolated communities;

(c) advise communities on the appointment of On-site Coordinators;

(d) visit isolated communities and with the On-site Coordinators to establish an education awareness program focused on promoting increased production of goods that can be traded with the objective of maintaining and improving the frequency of ship calls through the establishment of a minimum threshold volume of cargo that will attract ship calls;

(e) coordinate the timing of ship calls to optimize the harvest of marketable cash crops;

(f) ensure isolated communities are informed of shipping support measures including ship schedules, freight rates, etc.;

(g) build and maintain a network of purchasers of produce in urban markets and advising of the availability of crops for market;

(h) ensure isolated communities will have produce ready for loading and inwards goods (orders) arranged for shipping services provided under the SSS Scheme;

(i) advise ship owners of when cargoes will be ready for shipping and facilitate the ship calls to collect the cargo;

(j) maintain communications between the isolated communities receiving support and ship owners;

(k) keep Area Secretaries in isolated communities informed so they can coordinate their endeavors with the SSS Scheme and the Shipping Coordinator Scheme to ensure their communities obtain the maximum benefits from each;

(l) assist On-site Coordinators in educating isolated communities in ways to secure the maximum benefit from the SSS Scheme;

(m) advise the DG-MIPU, DG-Internal Affairs, and DG-Finance on general matters relating to shipping support measures for isolated communities;

(n) provide the DG-MIPU (and the DONOR AGENCY(S)) with regular reports against the agreed work plan and schedule;

(o) provide cash flow projections to the MIPU for the SSS Scheme for the forthcoming next two months, on a monthly basis to meet the MFEM reporting cycle;

(p) provide estimates for SSS Scheme costs for the forthcoming year to the MIPU;

(q) together with the donor determine funding requirements for the next year; and

(r) represent isolated communities on matters relating to shipping support measures.

1.2.7 On-site Coordinator: Role and Tasks

71. The *purpose* of the On-site Coordinator is to assist the Shipping Coordinator in the implementation and management of the SSS Scheme and the Shipping Coordinator Scheme to ensure their effective and efficient application for the benefit of individual isolated communities. In other words, to help secure the supply of shipping services to match the demand for shipping services and so foster economic and social development in isolated communities.

72. The On-site Coordinator's *role* is to promote and coordinate the efforts of an isolated community to attract shipping, to promote increases in the production of local produce for market and to maintain communications with the Shipping Coordinator.

73. The On-site Coordinator's *tasks* are to:

(a) ensure isolated communities are well informed about the SSS Scheme, particularly the obligations and responsibilities of individual communities and how best they can benefit from the Scheme;

(b) assist in educating isolated communities in ways to secure the maximum benefit from the SSS Scheme initially through a sea transport and trade awareness program, prices of cash crops in the urban markets, and potential buyers of their produce, which will enable communities to appropriately plan their activities;

(c) assist isolated communities in the selection of consolidation or focal points as the designated trading posts for shipping services;

(d) inform isolated communities of shipping support measures including ship schedules, freight rates, *etc*. and promote the use of these services;

(e) ensure isolated communities have produce ready and inwards cargo (orders) arranged for shipping services provided under the SSS Scheme;

(f) maintain communications between the isolated communities receiving support measures and the Shipping Coordinator;

(g) maintain and preserve records and documents relating to shipping operations, cargo volumes and passenger numbers using support measures to assist in determining the effectiveness of these measures at the selected focal points;

(h) advise the Shipping Coordinator on general matters relating to SSS Scheme and the Shipping Coordinator Scheme for their isolated community(s);

(i) represent their remote community(s) on matters relating to the administration, management, and operation of the SSS Scheme and the Shipping Coordinator Scheme; and

(j) share and exchange information with other On-site Coordinators.

74. The appointment of On-site Coordinators will be made by the respective communities for which the On-site Coordinator will be responsible. The person selected will need to have the support and confidence of the local community and a reasonable appreciation of community requirements and some understanding of domestic shipping requirements.

1.2.8 Capacity Building Specialist - Technical Assistance

75. The *purpose* of the Capacity Building Specialist is to provide specialist technical support during the initial phase of establishing the Shipping Coordinator Scheme.

76. The *role* of the Capacity Building Specialist is *to assist* the Shipping Coordinator in establishing transport and trading awareness programs, in developing a communication network to facilitate trade between remote communities and markets, and, in developing procedures and systems for recording transport and trade levels.

77. The *tasks* of the Capacity Building Specialist are *to assist* the Shipping Coordinator to:

- develop a work plan and schedule for the next twelve months against which the Shipping Coordinator will report to DG-MIPU and donor agencies as appropriate;
- design the transport and trading awareness program and assist in its delivery to selected remote communities that would in the first instance be used as a pilot program;
- develop communication networks and procedures between the Shipping Coordinator, On-site Coordinators, the MIPU, shipping companies, produce buyers, Provincial Secretaries and local area councils in order to keep all informed of transport and trading requirements;
- establish systems to record ship calls, cargo types and volumes, and passengers embarked and disembarked at remote communities that are fall under the Shipping SSS Scheme and the Shipping Coordinator Scheme;
- establish performance measurements to gauge the success and progress of the SSS Scheme and the Shipping Coordinator Scheme;
- establish simple accounting procedures and records for managing expenditure incurred during the discharge of the Shipping Coordinator's tasks;
- promote the SSS Scheme and the Shipping Coordinator Scheme to inter-island shipping companies; and
- promote the SSS Scheme and the Shipping Support Scheme to buyers of cash crops.

1.2.9 Shipping Coordinator Design Issues

78. There are a number of questions that arise in designing the Shipping Coordinator Scheme:

a) What time is involved and the cost of engaging a Capacity Building Specialist?

b) Where should the Shipping Coordinator be stationed?

c) How best can the audit and performance monitoring requirements be achieved?

d) What is the best means in filling the information gap on the estimated time of arrival of vessels for isolated communities?

e) How many On-site Coordinators are required to support the SSS Scheme?

79. Each of these questions are examined in the following sections in which the best or most appropriate answer is decided upon which in turn illustrates the process through which the proposed scheme has been designed.

1.2.10 Issue (a): What time is involved and the cost of engaging a Capacity Building Specialist?

80. Following the recommendations of the VISSP1 report, the GoV agreed to implement a SSS Scheme as a means to reducing community stress and promoting economic and social development.[6] Rationale for having the Shipping Coordinator Scheme commence with the Shipping Support Scheme is as follows:

- without the Shipping Coordinator Scheme to backstop the SSS Scheme, the GoV would not have an audit or performance monitoring measures in place;
- the underlying key issues of improving community awareness of why vessels call and the trade cycle remain unaddressed; and
- the SSS Scheme on its own would send the wrong message to isolated communities that it is a “hand out” rather than a “hand up”.

81. In order to increase the capability and confidence of people of Vanuatu to quickly implement and receive the benefits of both the SSS Scheme and the Shipping Coordinator Scheme technical assistance is needed at the outset to assist the Shipping Coordinator. Without this both schemes could flounder, community stress would remain or perhaps even increase, and economic and social development further hindered.

82. Capacity and confidence building assistance could be provided from two possible sources: a specialist under a short term contract or a person specially selected from the New Zealand Volunteer Services Abroad (VSA) scheme or similar.

83. The VSA Programme Officer in Vanuatu advised that it would take at least six months before they could field a person in such a technical assistance role as part of the Shipping Coordinator Scheme. However, to advertise or select an appropriately skilled person from registered persons with a donor agency, it is estimated that approximately three months would be needed if the process of engagement for both commenced from the same start date.

84. The cost differentials of providing such a skilled person are:

- An appropriately skilled VSA person is estimated to cost Vt201,000 for a 60 day support period. It has been assumed that accommodation costs would be similar to a consultant due to the short engagement term and so the main differential is the fee cost. The overall cost of accommodation including that for remote locations, amounts to Vt1.541 million. The overall cost of a VSA person is therefore Vt1.742 million.
- The equivalent cost for suitably skilled consultant is estimated to be Vt4.891 million for a 60 day support period.
- Other costs such as the travel are common to both.

85. Thus, the cost of providing a Capacity Building Specialist would be about Vt1.8 million to Vt 4.9 million excluding travel costs, which compares with Vt3.3 million for the SSS Scheme based on a 15-18 month support schedule. The cost of the Shipping Coordinator Scheme in the first year is about Vt12.9 million or Vt8 million excluding the Capacity Building Specialist and about Vt7.4 million in subsequent years. So, the argument is that for the cost of a Capacity Building Specialist, estimated at Vt4.9 million at the outset, then Vt7.4 million annual expenditure on support, would be well placed and yield economic and social development dividends in following years.

86. If the Shipping Coordinator Scheme commences considerably later that the SSS Scheme, the benefits of the latter to isolated communities is likely to be reduced or even nonexistent and little information will be available to evaluate if the SSS Scheme is actually achieving its objectives.

1.2.11 Issue (b): Where should the Shipping Coordinator be stationed?

87. There are a number of alternatives for the location of the Shipping Coordinator. Consideration was given to locating the Shipping Coordinator at either Luganville or Port Vila, or having one stationed at both places. With the later having one Shipping Coordinator focused on

[6] To this end, the GoV set has set aside Vt10 million for the 2009 budget year to enable the Shipping Services Support Scheme to be implemented as soon as possible.

communities serviced by shipping out of Luganville and the other at Port Vila focused on servicing communities in the Tafea. After reviewing the tasks for the Shipping Coordinator role and the liaison requirements with the MIPU, donors and the added costs of another person it was decided that one full time person could perform the task better than two part time persons. The earlier lack of telecommunications is not a large issue now that coverage of the mobile network extends to all but one of the selected isolated communities that fall within domains of the SSS Scheme or the Shipping Coordinator Scheme. This means the Shipping Coordinator can now maintain communications with all but one On-site Coordinator by using mobile phones.

88. As the tasks of liaison and reporting will take place in Port Vila, the most appropriate location for the Shipping Coordinator is Port Vila.

89. The next location issue is where to the Shipping Coordinator should maintain an office from which to work. There are three possible choices: within the donor offices, MIPU, or attached to the Shipping Scheme Administrator, such as a firm of accountants as suggested in VISSP1. In-country offices for donor agencies are typically well used and those attached to diplomatic missions tend to be focused on diplomatic relations at the highest level, thus in addition to project specific issues, such sensitivity and security issues rule donor agencies out.

90. The MIPU has insufficient space to house its current functions that are mainly focused on infrastructure policy and management. Any spare space is regularly occupied by donor teams assisting the GoV developing policy, improve or maintain existing infrastructure. Furthermore when its policy functions are all established, additional space will needed within the MIPU.

91. Attachment of the Shipping Coordinator to the Shipping Scheme Administrator, i.e. a firm of accountants, was recommended in VISSP1 and is reaffirmed.[7]

92. Cost estimates to provide an office within a chartered accountant's premises and ongoing support amounting to approximately ten hours per month totals Vt150,000 per month. Part of this cost is inclusive of overseeing the SSS Scheme functions and the endorsement of payment. The cost also includes the use of a desk, two chairs, toilet facilities, guidance support in monthly report production and review of reports before their distribution to intended recipients. The project would provide the Shipping Coordinator with an assistant, telephone, message answering equipment, printer, stationery, and travel costs. These costs are detailed in *Figures 1.4 and 1.5*.

1.2.12 Issue (c): How best to achieve audit and performance monitoring?

93. It is proposed to meet the audit and performance measurement requirements by implementing a basic and simple data collection system. As part of the SSS Scheme, ship captains need evidence of a ship call and need to complete a simple return of passengers and cargo carried to and from that community in order to get payment for the contracted service. Currently, larger ship owners advise that they do not maintain records of volumes carried on each voyage, while others are reluctant to divulge any information for competitive or other reasons. The introduction of a simple data collection system would generate baseline information where currently none exists and provide a measure to assess if SSS Scheme payments be decreasing or not depending on the amount of cargo and passengers being transported.

94. One of the On-site Coordinators' tasks is to maintain information on the number of passengers disembarked and boarding the ship for other destinations and for cargo discharged and loaded by each vessel calling at the isolated communities being supported by either scheme. This information will be SMS texted to the Shipping Coordinator in Port Vila on a monthly basis if not a shorter interval. *Figure 1.6* details the information to be texted. The information is all numeric and conforms to a summary that each will complete and maintain. When the Shipping Coordinator makes

[7] The reasons for having the SSS Scheme administered by a firm of international chartered accountants included the need for the Shipping Support Scheme payments to be overseen by an independent body to minimize possible collusion, ensure public and donor money is fully accounted for, and to meet audit and performance measures requirements. While this is unlikely to occur in the MIPU, it is recognised that the MIPU has the capability and systems to make payments it has not been audited nor has the MIPU been visited by the government audit for at least ten years. A review of the government financial systems shows that it focused towards control of government funds and has yet to develop skills focused on performance measurement of individual programs. Performance measurement is critical to the ongoing success of both the SSS Scheme and Shipping Coordinator Scheme, and an independent body is best to do this.

his bi-annual visit to each of the communities this cargo and passenger information can be collected in greater detail.

95. The Shipping Coordinator with some initial assistance from the Shipping Scheme Administrator will compile a month report to be delivered to MIPU and donor agency(s) as required. This report, detailed in *Figure 1.7*, would be compiled from the monthly On-site Coordinators' SMS texted reports. It will summarize the activities for each month, compare information provided by ships captains and On-site Coordinators, and show trends in passenger numbers and cargoes from each destination. From this, assessments can be made on the level economic activity, whether it is increasing or decreasing in each community, the impact and degree of success being achieved, the need for any refinements to either scheme, or whether either scheme has reached its maturity and support is no longer required.

96. Information generated by the Shipping Coordinator Scheme could be applied to providing basic information on domestic shipping and trade within Vanuatu. This would assist in providing information for MIPU policy development and strategic planning purposes on sea transport needs and for a review of future government support for these schemes.

1.2.13 Issue (d): What is the best means in filling the vessel arrival time information gap?

97. There are three possible solutions:

- resurrect the radio bulletins previously provided on Radio Vanuatu to the planned increased power that will enable it to reach all isolated communities in Vanuatu;
- for the Shipping Coordinator to advise each On-site Coordinator on a regular basis by text message of estimated times of arrival in isolated communities; or
- to provide a message answer service for anyone with a mobile phone to call and find out the latest estimated time of arrival for ships calling at all isolated communities.

98. Prior to the downgrade in range Radio Vanuatu was the preferred radio for almost all people in remote areas of Vanuatu. When making a choice on which media to advertise, most business persons usually choose the one with the largest audience. With increased power and range that is now being implemented through the assistance of the New Zealand Government, Radio Vanuatu could significantly increase the number of its listeners simply by again providing regular allocated time spots to broadcast information on ship schedules and their estimated times of arrival. However, in the past Radio Vanuatu has been inclined to charge retail advertising rates for these time spots, which has discouraged the broadcast of shipping information.

99. Advising shipping schedules and times by SMS text messages is a low cost option. However, it only reaches those persons with direct daily telecommunications contact with the On-site Coordinator; not many people in isolated communities have access to a mobile phone.

100. Provided information is forthcoming from ship owners a message answer service can operate to the advantage of both parties. Ship owners' office staff constantly field calls enquiring about ship arrival times. If all persons in Vanuatu where able to access a recorded message that proved to have a high degree of reliability, then all parties would benefit. Ship owners' would not have to devote so much time to the issue. People in outer island communities would be the main beneficiaries as waiting time, which translates into spoilt produce, would be reduced and so there would be more incentive to produce beyond that for a subsistence level.

101. Unless Radio Vanuatu has a change in attitude to providing a free service to the nation in return for achieving a greater listening audience, then the next best option is to set up a message answer service.

102. The Shipping Coordinator is in the best position to collate and disseminate information on ship schedules and timing and, indeed, this is one of the tasks concerning shipping services support to isolated communities. This task could be expanded to cover all shipping services to outer islands for dissemination by Radio Vanuatu or a message answering service. It is a simple step to maintain additional records of call patterns and destinations. For this reason, in addition to other support tasks, that a part time assistant to the Shipping Coordinator is suggested. This person would contact the shipping companies daily to update the estimated time of arrival information.

1.2.14 Issue (e): How many On-site Coordinators are required to undertake the Shipping Support Scheme?

103. The following communities quality for support from the Shipping Coordinator Scheme or SSS Scheme or both: Aniwa, Futuna, Erromango, Aneityum, Ureparapara, Torres Islands, some islands in the Banks Group, North West Santo and Big Bay. Section 1.1.2 details the locations qualifying for the SSS Scheme. Isolated communities in the Banks Group, North West Santo and Big Bay qualify for the Shipping Coordinator Scheme.

104. In total, it is assessed that eight On-site Coordinators will be required to support the Shipping Coordinator based in Port Vila.

105. Only the On-site Coordinator located in North West Santo will require a two way radio for communication purposes. All other locations are within the existing mobile telecommunications network. As the communities in the Torres Islands are relatively small, provision has been made for the respective On-site Coordinator to travel by boat to each of these communities to coordinate the shipping services support. Communities in North West Santo and Big Bay are spread out along the coast and the On-site Coordinator will be able to walk between them to coordinate the support effort.

106. All locations are accessible by air. Big Bay can be accessed by road from Luganville; Ureparapara from its nearest airfield and then by boat; likewise other islands in Torres by boat from the nearest airfield.

107. Provision has been made in the cost budget for visits by the Shipping Coordinator and the On-site Coordinators as per *Figure 1.5*.

1.2.15 Design Issue Conclusions

108. The following conclusions about the design requirements for the Shipping Coordinator Scheme have been arrived at and used for determining the cost of the scheme:

- a consultant should be engaged as early as possible so that the Shipping Coordinator Scheme can be implemented without delay;
- the Shipping Coordinator be located in Port Vila at the office of the Shipping Scheme Administrator;
- the SSS Scheme contract should require a return a report on the number of passengers carried and the volume of cargo loaded and discharged for each ship call to be part of the requirements for payment;
- information systems be established to provide ship schedule and timing details; and; unless Radio Vanuatu is prepared to broadcast shipping information as an essential community service the next best option is for the MIPU to set up a message answer service;
- shipping information collected by the Shipping Coordinator form the basis of domestic sea transport and trade information to facilitate government policy and planning; and
- a minimum of eight On-site Coordinators are required to operate the Shipping Coordinator Scheme.

1.2.16 Implementation

109. It would be ideal if the SSS Scheme and the Shipping Coordinator Scheme commenced at the same time. Delays in the SSS Scheme would mean that some remote island communities continue to suffer community stress and sustainable economic and social development would be hindered. For the implementation steps described below, it has been assumed that the SSS Scheme commences prior to the Shipping Coordinator Scheme.

110. The steps in approximate chronological order to implementing the Shipping Coordinator Scheme are to:

- finalize and agree refinements to the Shipping Support Scheme and Shipping Coordinator Scheme;

- finalize and agree funding for the Shipping Coordinator Scheme;
- MIPU establishers and agrees on a commencement date for the Shipping Coordinator Scheme;
- advertise the position of the Shipping Coordinator and the Capacity Building Specialist - select and make appointments for each position;
- enter into a contract with a firm of chartered accountants who provide high quality audit services and who are preferably affiliated to an international auditing firm;
- provide the Shipping Coordinator and the Capacity Building Specialist with documentation, procedures and reports for both schemes to study and become familiar with;

111. In turn the Shipping Coordinator and the Capacity Building Specialist will:

- in the first two weeks complete a work plan and schedule setting up the Shipping Coordinator Scheme in all target isolated communities and obtain the agreement and approval of the MIPU and donor agency(s) as appropriate;
- design and write the awareness program plus supporting information and print copies some for distribution to participants and interested parties;[8]
- establish performance and audit measures to gauge future changes in cargo volumes and the degree of success being achieved by the two schemes and their impact on each remote community;[9]
- design and agree on the formats of future reports to be delivered to the MIPU and donor agency(s) as appropriate;[10]
- confirm and update planned ship calls to the selected communities by discussion with the shipping companies;
- establish contact with prospective buyers of cash crops, create a database of names and contact details, and, determine existing urban market prices for produce and cash crops for distribution to isolated communities;[11]
- arrange visits to isolated communities in each province to conduct the awareness program, the tasks of the On-site Coordinators and their selection;[12]
- hold discussions with Radio Vanuatu on establishing a domestic shipping information service using information collated by the Shipping Coordinator's assistant;
- advise domestic shipping companies of the establishment a shipping information service using either Radio Vanuatu or an SMS answer phone service and seek their cooperation and direct input;

112. As time permits the Shipping Coordinator and the Capacity Building Specialist will both carry out the following tasks otherwise the Shipping Coordinator alone will:[13]

- travel to the selected communities and present the program;

[8] The awareness program should include; overview and concept of both schemes, attracting shipping, maintaining and increasing future services, selection of the on-site coordinator and tasks, discussion on available cash crops and achievable volumes, costs associated with sending goods to market, cash planning and future program steps.

[9] The On-site Coordinators will maintain the base records and forward them to the Shipping Coordinator. As communications may in some areas be difficult the reports should be simple and short.

[10] The reports include actual, forecast expenditure against budget for both schemes, dates of ship calls at remote communities, volume of cargo discharged and loaded, number of passengers, community satisfaction measure, brief comments on issues arising,

[11] Provision will have to be made for the cost of freight.

[12] It is suggested that the first part of the program be open to all interested community participants, the second part in discussions with the community council on issues arising, followed by the balance of the awareness program.

[13] The Capacity Building Specialist will depart after the completion of the initial two or three visits to isolated communities and the completion of a report on the implementation.

- advise the Area Council on the role and tasks of an On-site Coordinator, a suggested procedure for selecting or electing the On-site Coordinators, payment for performing the role and tasks, *etc*;
- provide the successful candidate with the tools of the trade, record book, documentation, *etc* and brief the On-site Coordinators on their tasks, performance measures, reports, means of communication, reporting dates and times;
- with the assistance of the Area Council and the newly appointed On-site Coordinators assess possible production levels and timeframes to grow and prepare produce for market throughout the course of a year; establish prices for cash crops sold by members of the community in the recent past, compare these with current prices in urban markets; and record the information in the Shipping Coordinator database;
- with each community discuss, agree and prepare an initial plan to increase the amount of produce to ship to market over the medium to long term;
- determine and agree upon the weight and size of bags for each community to ship produce to market, then apply these descriptions and weights in future reports;
- determine and agree common measures and weight for the types of cargo commonly landed at each of the communities, then apply these descriptions and weights in future reports
- advise the proposed date of the follow up visit;[14] and
- meet with the MIPU, donor agency(s) as appropriate and report on the visits, issues arising, lessons learned and any adjustments considered necessary to refine the Shipping Coordinator Scheme.

113. The Shipping Coordinator will:

- advise the DG-MIPU of the need for ship calls at specific isolated communities to initiate the SSS Scheme bidding and tender process;
- for outer island communities assist with the coordination of ship calls with community needs in order to facilitate the sale and purchase of produce and goods to and from urban markets;
- visit isolated communities at least once per year until the Shipping Coordinator Scheme becomes self-supporting;
- provide a monthly report to MIPU summarizing number of ship calls to each isolated community and volumes of cargo and passengers carried;
- provide a written six monthly report to MIPU and donor agency(s) as appropriate; and
- prepare an annual review against agreed performance measures, an operational and financial budget for the forthcoming year, report on the overall conduct and acceptance of the SSS Scheme from both the domestic shipping companies' and isolates communities' perspectives and make suggestions for the continuation or otherwise of the SSS Scheme and Shipping Coordinator Scheme.

1.2.17 Cost Estimates

114. The total cost of the Shipping Coordinator Scheme in the first and subsequent years is estimated at Vt12.85 million and Vt7.345 million respectively, the detailed costs are shown in *Figure 1.4*. In the first year, the main cost components of the Shipping Coordinator Scheme are salaries (65%), operating costs (16%) and travel and accommodation (8%). Communications costs are only 2% of estimated total costs. For the second year, total estimated costs are 57% of those of the first year. In the second year salaries comprise 47%, operating costs 27%, with travel and

[14] It is suggested that initially two visits be undertaken in the first year and thereafter once per annum until the schemes become self-generating without the need for continued support.

accommodation being the remaining 13%. Communications costs are still small at only 4% of estimated total costs.

Figure 1.4: **Estimated Shipping Coordinator Scheme Costs Year 1 and Subsequent Years**

Item	Capital	Recurrent	Quantity	Unit	Rate	Vt	NZ$	US$	Share Y1	Share Y2
Salaries										
Coordinator		×	1	Per Annum	1,900,000	1,900,000	28,358	19,000		
Onsite Coordinators		×	8	Per Annum	120,000	960,000	14,328	9,600		
"Coordinator" Part Time assistant		×	1	Per Annum	600,000	600,000	8,955	6,000		
Capacity Building Specialist		×	50	days	67,000	3,350,000	50,000	33,500		
- Per Diem										
- Vila		×	50	days	28,542	1,427,100	21,300	14,271		
- Other		×	10	days	9,179	91,790	1,370	918		
Total Salaries						8,328,890	124,312	83,289	65%	47%
Operating										
Cell phones	×		8	ea	2,000	16,000	239	160		
Radios	×		1	ea	33,500	33,500	500	335		
Message service	×		1	ea	40,000	40,000	597	400		
PC Computer	×		1	ea	80,000	80,000	1,194	800		
Printer	×		1	ea	30,000	30,000	448	300		
Office - at chartered accountants		x	12	month	150,000	1,800,000	26,866	18,000		
Stationery etc		×	var	est PC	100,000	100,000	1,493	1,000		
Total Operating Costs						2,099,500	31,336	20,995	16%	27%
Communitcation Costs										
Cell Phones "On-site"		×	84	month	2,000	168,000	2,507	1,680		
Cell Phone "Coordinator"		×	12	Month	4,000	48,000	716	480		
Radios		×	12	month	1,000	12,000	179	120		
Message Service		×	12	month	3,000	36,000	537	360		
Total Communications Costs						264,000	3,940	2,640	2%	4%
Travel										
Travel and Accomodation Coordinator		×	1	Annually		823,916	12,297	8,239		
Travel Capacity Building Specialist		×	1	contract		45,620	681	456		
Travel On-site Coordinator Torres		×	1	Annually		120,000	1,791	1,200		
Total travel costs						989,536	14,769	9,895	8%	13%
Estimates Year 1						11,681,926	174,357	116,819	91%	
Contingency 10%						1,168,193	17,436	11,682	9%	
Total Estimated Annual Costs Year 1						**12,850,119**	**191,793**	**128,501**	100%	
Estimates Year 2						6,677,916	99,670	66,779	52%	91%
Contingency 10%						667,792	9,967	6,678	5%	9%
Total Estimated Annual Costs Year 2						**7,345,708**	**109,637**	**73,457**	57%	100%
$NZ 1 = Vt 67 **$US 1 = VT 100**										

115. Air travel is the primary means of visiting isolated communities, but in two cases visits to Ureparapara and between communities in Torres Islands transport will be by boat. Communities located in North West Santo and Big Bay are scattered along the coast and so the On-site Coordinator has no option but to walk from his village to village for those encompassed by the Shipping Coordinator Scheme.

116. Air Travel costs have been taken from the Q3/09 Air Vanuatu Fare Schedule. Travel costs by boat have been estimated from 2008 quotes updated for increases in the cost of fuel and general operating costs. Estimates travel costs are shown *Figure 1.5*.

117. Both cellular service providers in Vanuatu measure usage by outgoing rather than incoming traffic. Furthermore, their policy is to cut services after four months if no outgoing calls have been made, regardless of the remaining credit. The only way to maintain a connection is to make a further payment before the four months term expires. The message answering system has no outgoing traffic and so a top up is required before the end of four months to keep the number and the message service operating.

118. The capital costs of the proposed message service and the two-way radio required at North West Santo are based on information provided by telecommunications companies in Port Vila.

119. The proposed message service system can be operated by:

- a land line and PABX, or
- land line connected to a computer with appropriate software, or
- cell phone connected to a computer with appropriate software.

The first option is the most expensive, while the third option is the least cost. The cost estimates provide are based on the first option and based upon the 2009 rates. If technology available in New Zealand is used the operating costs can be significantly decreased.

120. Salaries for the Shipping Coordinator and On-site Coordinators have been graded against the current public services rates for a senior manager and those reporting to such a person.

Figure 1.5: **Estimated Shipping Coordinator Scheme Costs of Travel**

Coordinator	Destination	Route		Quantity	Unit	Rate	Vt	NZ$	US$
		Air	Boat						
Airfares	Erromango	VLI-DYL-VLI		2	ea	16,340	32,680	488	317
	Aniwa	VLI-AWD-VLI		2	ea	23,080	46,160	689	448
	Futuna	VLI-FTA-VLI		2	ea	21,740	43,480	649	422
	Aneityum	VLI-AUY-VLI		2	ea	30,740	61,480	918	596
	Loh	VLI-TOH-VLI		2	ea	41,540	83,080	1,240	806
	Ureparapara	VLI-MTV-VLI		2	ea	38,840	77,680	1,159	754
			MTV- URE	2	ea	40,000	80,000	1,194	776
	N W Santo	VLI-SON-SWJ-VLI		2	ea	41,880	83,760	1,250	813
	Big Bay	VLI-SON-VLI		2	ea	27,800	55,600	830	539
		Road		2	ea	14,000	28,000	418	272
Airport Charges				18	ea	250	4,500	67	44
				18	ea	400	7,200	107	70
Accomodation		3 nights per destination		24	ea	9,179	220,296	3,288	2,137
OS Coordinator	Other Torres Islands		Others	8	ea	15,000	120,000	1,791	1,164
							943,916	**14,088**	**9,157**
Capacity Building Specialist									
Airfares	Aniwa	Vli-Awd-Vli		1	ea	23,080	23,080	344	224
	Futuna	Vli-Fta-Vli		1	ea	21,740	21,740	324	211
Airport Charges				2	ea	400	800	12	8
NOTE: BB = Big Bay							**45,620**	**681**	**443**

1.2.18 Reports

121. *Figure 1.6* is the report to be completed each month by the On-site Coordinators. Its purpose is to help assess the effectiveness of the schemes, to provide information on ship contract performance and to collect sea transport and trade information. The On-site Coordinators' monthly text report should be compared with the information provided by the ship's captains before final payment for contracted voyages or diversions. Any variations need to be noted and discussed with the shipping company concerned.

122. *Figures 1.7 and 1.8* are monthly reports compiled by the Shipping Coordinator. *Figure 1.7* is the monthly report for each community. *Figure 1.8* is the consolidated report for those isolated communities supported by the SSS Scheme and also for those communities supported by the Shipping Coordinator Scheme.

123. *Figure 1.9* illustrates the type of financial information and monthly report to be compiled from by the Shipping Coordinator, perhaps with the assistance of the Shipping Scheme Administrator, and provided to the MIPU.

124. All reports should also include provisions for a signature and date blocks.

Figure 1.6: **Monthly On-site Coordinator Text Reports**

			Data to be SMS
Coordinator Scheme Report	**Month**…… **Location**……		
Month; 1, 2, 3 etc			
1 Number of Ship Calls	**Number**		
2 Dates of Calls	**Day of Month**		
3 Ship	**Name**		
4 Adult passengers that arrived	**Number**		
5 Adult passengers that departed	**Number**		
6 Children passengers that arrived	**Number**		
7 Children passenger that departed	**Number**		
CARGO DISCHARGED			
8 Volume of foodstuffs discharged	**Estimate of Cubic M2**		
9 Building Materials	**Approx Kgs**		
10 Other	**Approx Kgs**		
CARGO LOADED			
11 Sacks of Corpra loaded	**Kilograms**		
12 Kava	**Kilograms**		
13 Other Crops	**Kilograms**		
14 Animals	**number**		

Notes

1. Report to be text to Coordinator 1st Working Day of each month

2. For items 7 to 12 On-site Coordinators will maintain a record in greater detail of the items imported and types of crops and their weight loaded. for when the Coordinator makes the six monthly visit and obtains such details.

Figure 1.7: **Shipping Coordinator's Monthly Report for Each Community**

Coordinator Scheme Report **Month**…… **EXAMPLE ONLY**
Location……..

Month	**Jan**	**Feb**	**Mar**	**April**	**May**	**June**	**July**	**Aug**	**Sept**	**Oct**	**Nov**	**Dec**	**Total Ytd**
Ship Calls	1			1		2				1			5
By SSS	1			1		1				1			4
Date of Calls	10~1			9~4		20~6 23~6				3~10			
Vessel Name	Brisk			Brisk		Brisk Yo Lung				Brisk			
Passengers	**No.**	**No.**	**No.**	**No.**	**No.**	**No.**	**No.**	**No.**	**No.**	**No.**	**No.**	**No.**	**No.**
Children													
Pax Landed	5			20		5				10			40
Pax Embarked	20			5		20				25			70
Adult													
Pax Landed	10			15		30				35			90
Pax Embarked	6			25		15				20			66
Sub Total Landed	**25**	**0**	**0**	**25**	**0**	**25**	**0**	**0**	**0**	**35**	**0**	**0**	**110**
Sub Total Embarked	**16**	**0**	**0**	**40**	**0**	**45**	**0**	**0**	**0**	**55**	**0**	**0**	**156**
Cargo													
	Kgs	**Kgs**	**Kgs**	**Kgs**	**Kgs**	**Kgs**	**Kgs**	**Kgs**	**Kgs**	**Kgs**	**Kgs**	**Kgs**	**Kgs**
Loaded													
Copra	200			500		-				2,000			2,700
Kava	300			800		150				3,000			4,250
Taro										500			500
Timber						3,000							
Other													-
Sub Total	**500**	**-**	**-**	**1,300**	**-**	**3,150**	**-**	**-**	**-**	**5,500**	**-**	**-**	**10,450**
Animals - landed	2			0		10				0			12
													-
Discharged													-
Foodstuffs	80			120		300				900			1,400
Building Material				500		700				0			1,200
Other	100			0		300				2000			2,400
Sub Total	**180**	**0**	**0**	**620**	**0**	**1300**	**0**	**0**	**0**	**2900**	**0**	**0**	**5,000**

Agreed Weights and Containers for Reporting (by Coordinator and OSC)

	KGs
Large Bag of Copra	
Small Bag of Copra	
Basket of Copra	
Large Bag Green Kava	
Small Bag Gree Kava	
Basket of Green Kava	

Figure 1.8: **Summary Shipping Coordinator's Month and Year to Date Report**

Coordinators Summary Report **EXAMPLE ONLY**
Passengers and Cargo
Month **June~2009**

	Shipping Support & Cordinator Schemes						Coordinator Only		Totals
Community	**Aniwa**	**Futuna**	**Aneityum**	**Erromango**	**Ureparapara**	**Torres**	**NW Santo**	**Big Bay**	
Population	800	750	1600	2600	700	900	3500	3200	**14,050**
Ship calls	**No.**	**No.**	**No.**	**No.**	**No.**	**No.**	**No.**	**No.**	**No.**
- This Month	1	0	1	1	0	0	0	2	**5**
- YTD	2	1	3	2	3	1	3	3	**18**
Frequency									
- YTD	2, 6.	3	1, 3, 6.	2, 6.	2(2), 5.	5	2(2), 3.	2, 6(2)	
Numbers	**No.**	**No.**	**No.**	**No.**	**No.**	**No.**	**No.**	**No.**	**No.**
Pax Month	3	10	2	12	0	0	0	18	**45**
Pax YTD	45	10	90	36	21	15	23	31	**271**
Cargo	**Kgs**	**Kgs**	**Kgs**	**Kgs**	**Kgs**	**Kgs**	**Kgs**	**Kgs**	**Kgs**
Month									
- Discharged	2,000	-	400	120	-	-	-	5,000	**7,520**
- Loaded	800		500	250				1,500	**3,050**
YTD									
- Discharged	1,600	1,200	1,500	700	1,100	2,100	2,300	1,800	**12,300**
- Loaded	900	600	3,400	450	700	800	850	1,100	**8,800**

Notes:
1. For frequency record the number of the month followed by a coma. If there are two ship calls show these in brackets after the month.

Figure 1.9: **Shipping Coordinator's Month and Year-to-Date Financial Report**

Financial Report for Month and YTD

EXAMPLE ONLY

Month of ……..

	Month			Year To Date (YTD)		
Expenditure	**Actual Vt**	**Budget Vt**	**Variance Vt**	**Actual Vt**	**Budget Vt**	**Variance Vt**
Salary Coordinator						
Salary Assistant						
Salary OSCs						
Travel						
Coordinator - Air						
Coordinator - Other						
Accomodation						
Communications						
Coordinator - cell						
OSCs -Cell/ Radio						
Message Service						
Telephone rental						
Office Rental						
Other						
Stationery (Paper)						
Printer Cartridges						
Equipment R&M						
Sundry expenses						
Total Expenditure						

2. Infrastructure Requirements

This chapter describes the condition of the present wharves in Port Vila, Luganville and the outer islands and estimates the future demand for wharf berths. The chapter also describes the wharf design requirements for a future wharf in Port Vila and outer island jetties. Chapter 2 and chapter 3 are related.

The key features and issues concerning maritime infrastructure for domestic shipping are that:

- **domestic wharves are predominantly privately owned, although the government does own some facilities;**
- **there is little maritime transport infrastructure in the outer islands – there being a wharf at Litz Litz, on Malakula, and at Lenakel on Tanna;**
- **domestic wharves in Port Vila are in poor repair - the Star Wharf is in extremely poor condition and dangerous;**
- **Dinh Wharf has been sold for uses other than shipping and is to cease operating at the end of 2010;**
- **Port Vila is in critical need of new and additional domestic shipping wharf infrastructure;**
- **the government-owned Simonsen Wharf at Luganville, is in need of rehabilitation, although this may be deferred by up to 5 years;**
- **other, privately-owned facilities at Luganville range from 'well maintained' to 'in need of major rehabilitation' and the slipway is in extremely poor condition;**
- **repairs are needed to the two outer island facilities at Litz Litz and Lenakel.; and**
- **the demand for berth space in Port Vila is very high; Luganville has adequate capacity for the foreseeable future; Litzlitz and Lenakel have adequate capacity for the low utilization they currently receive; the potential utilization of wharves or jetties at other places in the outer islands is very low.**

It is recommended that:

1. **immediate repairs be made to Simonsen Wharf at Luganville and that by 2014 rehabilitation of the wharf be commenced; [section 2.2.2]**
2. **repairs be carried out at Lenakel to improve the safety and serviceability of the wharf; [s2.2.3]**
3. **repairs also be carried out at Litz Litz to improve its serviceability and consideration be given to building a ramp for landing craft; [s2.2.4]**

4. **because Marine Quay has reached the end of its structural life it be demolished; [s2.2.1 and s2.3.1]**

5. **a new wharf facility be built in Port Vila as soon as possible – South Paray Bay was used in the design concept as a suitable representative site; [s2.5.1 & s2.6.1]**

6. **a new Port Vila facility provide for sufficient length and depth to berth the three largest domestic ships (108m berth length and 3.0m water depth below chart datum), two landing craft ramps, some 2,200m2 backup land and suitable road access; passenger shelter, a freight collection booth, water and electricity supplies for use of ships, and sufficient space for a cargo shed in the future should also be provided – referred to in chapter 3 as Stage 1; [s2.6.2]**

7. **a fourth berth and backup land is likely to be needed by 2030 – referred to in chapter 3 as Stage 2; [s2.5.1]**

8. **outer island jetties cater for both conventional ships and landing craft with a jetty head for conventional ships 10m to 15m in length and a landing craft ramp that ideally has longitudinal access from the shore. [s2.7.2] and that**

9. **cost estimates for a new 100 tonne capacity slipway is about Vt 150 million. [s 2.8.2]**

Infrastructure Repairs & Rehabilitation Costs	*Vt 000s*
Demolition Marine Quay	9,775
Repair & rehabilitation Simonsen Wharf	111,844
Refurbish Lenakel Wharf and rebuild Ramp	44,309
Refurbish Litz Litz Wharf and build Ramp	33,602
Total Cost Estimate	199,530

2.1 Maritime Transport System in Vanuatu

125. Domestic maritime transportation in Vanuatu is characterized by ships that are capable of delivering and picking up cargo and passengers from outer island places that do not have any wharf or jetty infrastructure. Importantly, Vanuatu's geography is different to many other Pacific Island countries in that the islands are not atolls, or islands with significant coral reefs around the coastline. Vanuatu is characterized by steep coastlines with steeply shelving coastal seaboards. As a result, the domestic shipping has developed differently from other countries. Most of Vanuatu's beaches are accessible at any state of the tide; in fact, accessible enough that landing craft type of ships can land directly onto the beaches. This is in sharp contrast to other countries such as the Marshall Islands, Tuvalu, Cook Islands, and parts of Fiji, where boats from ships can realistically only land cargo and passengers at the top half of the tide.

126. For some decades now, both landing craft type vessels and conventional ships have played a major part in Vanuatu's maritime transportation, whereby the latter use their smaller boats for the

transfers of cargo and passengers to and from shore.[15] It is therefore important that whatever facilities are provided, both types of ships are able to use them.

2.2 Existing Publicly Owned Infrastructure Repairs and Maintenance

127. Publicly owned wharves are situated at Marine Quay in Port Vila, Simonsen in Luganville, Lenakel on Tanna and Litz Litz on Malakula. The condition of these facilities was assessed and as a result particular recommendations made. The results of the Project Team's assessment are summarized below. Full engineering investigation reports (EIRs) are located in the appendices.

2.2.1 Marine Quay

128. The GoV owned facilities at Marine Quay in Port Vila consist of a jetty situated centrally from a wharf quay face and apron. The jetty structure consists of reinforced concrete piles, headstocks and girders and a timber deck. The wharf structure consists of a mass concrete wharf quay and apron. Visual inspections were performed on the wharf and jetty in June 2009. An inspection by vessel was also carried out at low water to maximize the visible length of the wharf piles and substructure. Most components were inspected and each component group given a general condition rating. The detail of these inspections, assessments and recommendations is outlined in *Appendix 2.1*, the *Marine Quay Wharf (Port Vila) Engineering Investigation Report*.

129. The condition assessment revealed the following items. Corrosion of reinforcement and spalling has reached greater than 50% of the visible surface area of most concrete piles and severe overstressing and gross loss of section is evident in both piles in the seaward bay of the jetty. The jetty piles are therefore considered unserviceable and should be replaced or reinstated with members of an equal if not greater load bearing capacity as a matter of urgency as there is a high risk that ongoing berthing and mooring forces from vessels based at the facility, such as the *Northern Star* and *Southern Star* will cause failure of the headstock pile connections. There was also evidence that jetty concrete beams and headstocks have reached an advanced stage of deterioration are unserviceable and therefore should be rebuilt along with the piles. Further damage to the existing jetty structure from vessel loadings and seismic activity is also expected given conditions and usage.

130. The conclusions of the engineering investigation are:

- The removal of vehicular loadings and the restriction of high berthing and mooring forces from large vessels greater than 25 dead weight tonnes (DWT) will greatly reduce the risk of pile failure in the near term.
- As new management arrangements for the facilities are under negotiation at the time of writing this report, the long term future and use of the jetty is not known with certainty.
- From a structural point of view, the jetty has reached the end of its serviceable life and pending the outcome of new ownership and management arrangements a decision should be made for the demolition of the structure.

131. The estimated cost of demolition is outlined in *Table 2.1* below:

[15] See VISSP1 for greater detail.

Table 2.1: **Demolition Cost Estimate Marine Quay**

2010: Demolish and remove all materials from site

Item	Description	Unit	Quantity	Rate Vatu	Amount Vatu	Foreign proportion	Foreign Vatu	Local Vatu
1	Mobilisation to site, preliminaries and provision of equipment items	Item	100%	2,500,000	2,500,000	0%	-	2,500,000
2	Removal of deck	Item	1	500,000	500,000	0%	-	500,000
3	Removal of headstocks and girders	Item	1	2,500,000	2,500,000	0%	-	2,500,000
4	Removal & disposal of concrete piles**	Item	1	3,000,000	3,000,000	0%	-	3,000,000
	Sub-total				8,500,000	0%	-	8,500,000
11	Estimated Tender Price				8,500,000	0%	-	8,500,000
12	Project Administration 15%			10%	850,000		-	850,000
14	Construction Contingencies 5%			5%	425,000		-	425,000
Estimated Construction Cost		Vatu			9,775,000	0%	-	9,775,000
		USD		100	97,750		-	97,750
Total Project Cost		Vatu			9,775,000	0%	-	9,775,000
		USD		100	97,750		-	97,750

* Concrete substructure (piles and beams) are considered to be unserviceable

** assumes piles will be extracted and removed from site

2.2.2 Simonson Wharf

132. The GoV owned facility at Simonsen Wharf in Luganville consists of a wharf quay face, a partially destroyed ramp for landing craft, wharf apron and yard, cargo shed, and approach road. The quay structure consists of a steel sheet piled wharf face, reinforced concrete edge beam and makeshift fenders. The destroyed adjacent ramp structure consists of a mass concrete slab. Visual inspections were performed on the wharf and ramp and yard in June 2009. An inspection by vessel was also carried out at low water to maximise the visible length of the sheet piling and edge beam. Most components were inspected and each component group given a general condition rating. The detail of these inspections, assessments and recommendations is outlined in the *Appendix 2.2*, *Simonson Wharf Engineering Investigation Report*.

133. The condition assessment revealed the following items. While corrosion of the steel sheet piled wall is well advanced and has accelerated the end of wharves serviceable life, the most critical issue is the wear holes from vessels and subsequent washouts of fill from the wharf apron. Approximately 20% of the wharf apron and concrete edge beam cannot be used and requires urgent repair for safety and serviceability reasons. Replacement of the sheet pile wall and reinstatement of the concrete edge beam will be required in the medium term regardless of any emergency repairs to the wall as the wall strength cannot be maintained due to the advanced corrosion. The landing craft ramp is presently unserviceable and requires rebuilding should usage be warranted. Further damage to the wharf structure from vessel loadings and seismic activity is expected.

134. To address safety and serviceability issues at the wharf the following works are recommended:

- Immediate repairs to the wharf face to prevent further washouts from the wharf apron through the wall;
- Immediate repairs to the wharf apron through the backfilling of holes and provision of filter material;
- Reinstatement of the sheet piled wall and concrete edge beam in 2014; and
- Reinstatement of lighting and upgrading of the access road intersection in 2014.

135. The estimated cost of demolition is rehabilitation are summarised in *Table 2.2* below:

Table 2.2: **Cost Estimate Simonson Wharf**

Stage 1 (2014): New sheet piled wall for all berths & rebuild landing craft ramp

Item	Description	Unit	Quantity	Rate Vatu	Amount Vatu	Foreign proportion	Foreign Vatu	Local Vatu
1	Mobilisation to site, preliminaries and provision of major equipment items	Item	100%	10,000,000	10,000,000	75%	7,500,000	2,500,000
2	Removal of damaged capping beam	Item	1	1,000,000	1,000,000	0%	-	1,000,000
3	Construction of new sheet piled seawall with capping beam	L m	178	1,237,500	220,275,000	75%	165,206,250	55,068,750
3A	Install "D" mould rubber fenders 1.0 m high to face of wall	No	33	150,000	4,890,000	75%	3,667,500	1,222,500
4	Install 5.0 tonne SWL cast iron bollards on wall capping beam	No	8	230,000	1,729,600	75%	1,298,704	430,896
5	Construction of barge landing ramp	Item	1	40,000,000	40,000,000	50%	20,000,000	20,000,000
6	Maintenance dredge No 1 berth	Item	1	600,000	600,000	0%	-	600,000
7	Paving to roads, hardstand (300 mm coral) with 50 mm asphaltic concrete seal	Sq m	100	2,875	287,500	50%	143,750	143,750
8	Building PC Items:							
	(a) Passenger waiting and amenities building		-	10,000,000	-	50%	-	-
	(b) Gatekeepers building	Item	-	2,000,000	-	50%	-	-
9	Services- repair water supply, electricity, lighting	Item	1	500,000	500,000	25%	125,000	375,000
	Sub-total				279,282,100	71%	197,941,204	81,340,896
10	Engineering Design Fees 10%			10%	27,928,210		19,794,120	8,134,090
11	Estimated Tender Price				307,210,310	71%	217,735,324	89,474,986
12	Project Administration 15%			15%	46,081,547		32,660,299	13,421,248
14	Construction Contingencies 10%			10%	30,721,031		21,773,532	8,947,499
Estimated Construction Cost		Vatu			384,012,888	71%	272,169,156	111,843,732
		USD		100	3,840,129		2,721,692	1,118,437
Total Project Cost		Vatu			384,012,888	71%	272,169,156	111,843,732
		USD		100	3,840,129		2,721,692	1,118,437

Notes: The budget assumes the following :

1/ Steel prices include delivery ex Simonsen Wharf
2/ No allowance for removal of any pile toe beam

2.2.3 Lenakel Wharf

136. The facility at Lenakel, Tanna consists of a wharf quay face, wharf apron and yard, cargo shed and approach road.[16] The quay structure consists of a steel sheet piled and mass concrete wharf face, reinforced concrete edge beam and deck slab and concrete access roads. Visual inspections were performed on the wharf and ramp and yard in June 2009. Most components were inspected and each component group given a general condition rating. The detail of these inspections, assessments and recommendations is outlined in *Appendix 2.3*, *Lenekal Wharf Engineering Investigation Report*.

137. The condition assessment revealed the following items. Originally constructed in 1988-89, the wharf was rehabilitated in 1998 after suffering major damage from a cyclone in 1994 and remains today in generally sound condition. Some fenders are badly damaged and others are missing. Approximately 5-10% of the wharf kerbs have been damaged by shipping, and spalling of concrete and corrosion of exposed reinforcement is evident.

138. To address safety and serviceability issues at the wharf, the following works are recommended:

- Immediate repairs to the wharf fenders to prevent further damage to the remaining fenders and to reduce damage to ships;
- Reinstatement of missing fenders;
- Minor damage to the wharf kerbs requires attention to minimise further spalling of concrete and corrosion of exposed reinforcement; and

[16] There is some question as to whether there was ever previously an intentionally constructed landing craft ramp in the facility or location. There was not a landing craft ramp in the original JICA design, nor was a ramp rehabilitated in the late 1990s with the rest of the originally designed JICA works. However, there may have been a ramp previously, such as during 1940s, or the resemblance may simply be evidence of impact on the exposed coral reef of where landing craft have previously been using the site.

- Should it be deemed appropriate in order to cater to landing craft, the construction of a design amendment of a landing craft ramp and approach road at the possible previous site used by landing craft.

139. The estimated cost of the repairs and rehabilitation are summarised in *Table 2.3* below:

Table 2.3: **Cost Estimate Lenekal Wharf**

2010: Refurbish fenders and deck and & rebuild landing craft ramp

Item	Description	Unit	Quantity	Rate Vatu	Amount Vatu	Foreign proportion	Foreign Vatu	Local Vatu
1	Mobilisation to site, preliminaries and provision of major equipment items	Item	100%	10,000,000	10,000,000	75%	7,500,000	2,500,000
2	Removal of damaged concrete on deck	Item	1	1,000,000	1,000,000	0%	-	1,000,000
3	Reinstate concrete kerbs & decks	L m	30	25,000	750,000	50%	375,000	375,000
3A	Supply and fix new 300 deep arch fenders 2.0 m high inc removal of damaged units	No	10	300,000	3,000,000	75%	2,250,000	750,000
5	Construction of barge landing ramp	Item	1	50,000,000	50,000,000	50%	25,000,000	25,000,000
6	Construction of on shore mooring bollards	No	2	500,000	1,000,000	50%	500,000	500,000
7	Construction of approach roads (300mm Grade 25) to landing ramp	Sq m	280	15,000	4,200,000	50%	2,100,000	2,100,000
	Sub-total				69,950,000	54%	37,725,000	32,225,000
10	Engineering Design Fees 10%			10%	6,995,000		3,772,500	3,222,500
11	Estimated Tender Price				76,945,000	54%	41,497,500	35,447,500
12	Project Administration 15%			15%	11,541,750		6,224,625	5,317,125
14	Construction Contingencies 10%			10%	7,694,500		4,149,750	3,544,750
Estimated Construction Cost		Vatu			96,181,250	54%	51,871,875	44,309,375
		USD		100	961,813		518,719	443,094
Total Project Cost		Vatu			96,181,250	54%	51,871,875	44,309,375
		USD		100	961,813		518,719	443,094

2.2.4 Litz Litz

140. The facility at Litz Litz, Malakula consists of a conventional piled and concrete deck wharf with an approach causeway for access. Landing craft have been making use of the causeway approach road to berth, in addition to evidence that the structure itself has been previously damaged by the ramp of such craft when they have used it. Visual inspections were performed on the wharf and ramp and yard in June 2009. Most components were inspected and each component group given a general condition rating. The detail of these inspections, assessments and recommendations is outlined in *Appendix 2.4*, *Litz Litz Wharf Engineering Investigation Report*. A cargo shed was noted on the shore approach road, approximately 200 metres from the wharf.

Table 2.4: **Cost Estimate Litz Litz Wharf**

2010: Refurbish fenders and deck and & build landing craft ramp

Item	Description	Unit	Quantity	Rate Vatu	Amount Vatu	Foreign proportion	Foreign Vatu	Local Vatu
1	Mobilisation to site, preliminaries and provision of major equipment items	Item	100%	10,000,000	10,000,000	75%	7,500,000	2,500,000
2	Remove damaged concrete on deck,stairs	Item	1	1,000,000	1,000,000	0%	-	1,000,000
3	Reinstate concrete kerbs & stairs	L m	5	25,000	125,000	50%	62,500	62,500
3A	Supply and fix new 300 deep arch fenders 2.0 m high inc removal of damaged units	No	3	300,000	900,000	75%	675,000	225,000
5	Construction of barge landing ramp	Item	1	40,000,000	40,000,000	50%	20,000,000	20,000,000
6	Construction of on shore mooring bollards	No	2	500,000	1,000,000	50%	500,000	500,000
7	Construction of 10 m by 5 m abutment area for landing ramp	Item	1	150,000	150,000	0%	-	150,000
	Sub-total				53,175,000	54%	28,737,500	24,437,500
10	Engineering Design Fees 10%			10%	5,317,500		2,873,750	2,443,750
11	Estimated Tender Price				58,492,500	54%	31,611,250	26,881,250
12	Project Administration 15%			15%	8,773,875		4,741,688	4,032,188
14	Construction Contingencies 10%			10%	5,849,250		3,161,125	2,688,125
Estimated Construction Cost		Vatu			73,115,625	54%	39,514,063	33,601,563
		USD		100	731,156		395,141	336,016
Total Project Cost		Vatu			73,115,625	54%	39,514,063	33,601,563
		USD		100	731,156		395,141	336,016

141. The condition assessment revealed the following items. The wharf is in good condition apart from minor damage to the concrete deck from the action of vessels and wear and tear to several fenders. However, the actions of landing craft are causing damage to the approach causeway and road and preventative action is required to address further damage.

142. To address serviceability issues, repairs to the concrete deck and fenders is recommended in the short term.

143. To prevent further damage to the causeway, it is recommended that a design amendment in the form of construction of a concrete ramp and turning area be provided for landing craft.

144. The estimated cost of the repairs and rehabilitation are summarised in *Table 2.4* above:

2.3 Existing Domestic Maritime Infrastructure

2.3.1 Port Vila

145. *Table 2.5* details the utilisation of the existing Port Vila wharves in 2007. This has been calculated from data collected during VISSP1. Note that the analysis assumes that ships need no more than 30 hours alongside, and the berth-days required has been adjusted accordingly.

Table 2.5: **Berth Utilization: Port Vila**

Port	Wharf type	Wharf	Berth-days rqd pa	total berth-days available	Berth occupancy	No of ship calls	Avg days per call
Vila			**715**	**3,190**	**22%**	**623**	**1.15**
	General berths		**529**	**2,095**	**25%**	**461**	**1.15**
		Dinh xBP	344	1,022	34%	294	1.17
		Star	152	708	21%	140	1.08
		Marine Quay	34	365	9%	27	1.25
	Bowramp only berths		**186**	**1,095**	**17%**	**162**	**1.15**
		Dinh xBP ramp	99	730	14%	80	1.24
		Star ramp	87	365	24%	82	1.06

146. During the course of the Project in August 2009, the Project Team was advised that Dinh Wharf has been sold for land development use in a form other than as a domestic wharf. The tenants at the site have been given notice to vacate by 31 December 2010. In terms of its present use, the Dinh Wharf is well located in the centre of the town, although this contributes to the increasing congestion on the main road. The site is poorly configured given the amount of facility utilization.

147. The Star Wharf is well located and its configuration is good. A redevelopment plan for the site has been prepared by its present operator, the Ifira Group, in which the facility's proposed use will be transformed into an international wharf with a focus on containerized ship operations. The existing facility is in extremely poor condition. The quay itself is beyond repair, and is dangerous for users in current operations. The Consultant has concluded that it should be replaced by a new facility, wherein the existing structure should be demolished.

148. The Marine Quay is also well located. However, its structure and configuration are not suitable for ships as large as the domestic ships that regularly use it. The wharf's present condition is poor and it should not continue to be used by ships of the size that are currently using it, unless supplementary berthing and mooring facilities are provided, load restrictions put in place, or it is demolished and rebuilt to a higher capability for larger domestic ships. In August 2009, the Project Team was advised that Marine Quay has been leased out, possibly for use in an activity other than as a domestic wharf. Therefore, it is assumed that it is not available for domestic shipping.

149. The competitive situation in Port Vila was examined in VISSP1. Prices charged for wharf use in Port Vila are 76% higher than the charges for the same ship in Luganville. This appears to be the result of two factors:

- Wharf space is at a premium in Port Vila and facility owners are thus able to charge a higher price.
- Effectively, there are only two wharf operators, since Marine Quay is not really suitable for large vessels or normal cargo throughputs. More than two competitors

would fundamentally result in more competitiveness in an unregulated market such as the provision of wharves in Vanuatu.

150. To summarize, the present maritime infrastructure situation Port Vila is reaching a domestic shipping wharf crisis:

- Dinh Wharf, which has about 60% of the berth use for the whole of Port Vila domestic shipping, has been sold and the future land use will be for purposes other than domestic shipping.
- Star Wharf has about 35% of berth use. The wharf is in an extremely poor and unsafe condition and should be demolished and replaced. As stated above, the site is also subject to a redevelopment plan with a primary future facility purpose focused on international wharf operations.
- Marine Quay has the remaining 5% berth use in Port Vila, but has been reportedly leased out for use other than as a domestic wharf.

151. Therefore, all three domestic shipping wharf sites in Port Vila are likely to be unavailable in the near future.

2.3.2 Luganville

152. *Table 2.6* details the utilisation of the existing Port Vila wharves in 2007. This has been calculated from data collected during VISSP1. In general, Luganville has adequate capacity for the foreseeable future.

Table 2.6: **Berth Utilization: Luganville**

Port	Wharf type	Wharf	Berth-days rqd pa	total berth-days available	Berth occupancy	No of ship calls	Avg days per call
Luganville			**858**	**4,745**	**18%**	**902**	**0.95**
	General berths		**821**	**4,380**	**19%**	**861**	**0.95**
		Melcoffee	474	1,825	26%	549	0.86
		Melcoffee 2	68	365	19%	54	1.25
		Simonsen	204	1,825	11%	198	1.03
		Dinh	74	365	20%	60	
	Bowramp only berths		**38**	**365**	**10%**	**41**	**41.06**
		Green's Landing	38	365	10%	41	0.92

153. The Melcoffee Wharf is located to the west of the town. The location is a centre of domestic shipping, being near other wharves, the slipway, and the Maritime School. The site is well configured with large areas of backup land. The wharf deck height is, however, too low. At high water, ships can ride up over the wharf apron's top beam, which has been causing damage to both the wharf and ships. The wharf deck is estimated to be 0.4m too low. The facility's condition is reasonable, although some remedial work on local damage should be undertaken. Functionality is an issue with the height of the deck being well below current design standards. This may be most effectively remedied by installing a fendering system that rises higher than the wharf deck.

154. The Simonsen Wharf is located to the east of the town. The site is in a good location and well configured with large areas of backup land. While its structural condition is reasonable, functionality of the facility has been impacted upon due to damage from ships and seismic activity. Some immediate remedial work should be undertaken on some of this local damage to the wharf apron and berthing face to preserve its serviceable life. The adjacent ramp for landing craft is totally unserviceable and should be considered for replacement.

155. The Dinh Wharf is located to the west of the town. Similar to the Melcoffee Wharf, the location is a centre of domestic shipping, being near other wharves, the slipway, and the Maritime School. The site is well configured with large areas of backup land. However, it is in extremely poor condition.

The site has been damaged severely by an earthquake and the retaining wall structures have failed for most of the site.

156. Green's Landing is also located to the west of the town, near other wharves, the slipway, and the Maritime School. The site is very new and is well configured for landing craft operations. A new, secure warehouse has also been built on the site, and is used to receive and deliver cargo. Overall condition of the facility is excellent.

2.3.3 Malakula and Tanna

157. The wharves at Litz Litz, Malakula and Lenakel, Tanna are adequate for conventional ships and have adequate capacity for the low utilization they currently receive. Both, however, have not been designed for landing craft operations and are thus unsuitable for this purpose.

158. The Litz Litz Wharf on Malakula is a short distance south of the town of Lakatoro, Malakula's largest town. Its location is good being almost halfway down the east sheltered coast of Malekula and close to the east-west road bisecting the northern part of the island at its narrowest point. Generally, it has good road connections to the north as far as the small islands off the northeast coast (33 km to Vao), to the south with cargo coming from as far as Sarmette (20 km), and to the west coast to Lambumbu Bay (20 km). The connecting road to the west coast is, however, not in good condition, but will be rehabilitated in the near future as will the other connecting main roads under the AusAID funded VTSSP.

159. The Litz Litz wharf site is reasonably well configured. It is good for conventional vessels lying alongside, although its access for vehicles is constrained. Additionally, its design does not cater to landing craft for lowering their bow door. The facility is in reasonable structural condition; although some deferred maintenance needs to be done. The approach causeway's road could be widened to enable better access for vehicles. A landing craft ramp could be constructed on the southern side of the causeway, to replace the temporary makeshift one which is causing damage to the causeway.

160. The Lenakel Wharf is situated right in the middle of the town of Lenakel. It is a good location for persons within walking distance, or reasonably short driving distance. However, it has become the only place that ships regularly call at on island of Tanna. As a result, the considerable population at places such as Whitesand or Port Resolution have the added cost of road transport for 20 km to 35 km, which costs them between Vt5000 and Vt10,000 per tonne in addition to the sea freight.

161. The Lenakel Wharf is reasonably well configured for what is an exposed site. The cargo shed is some distance from the quay, unavoidably so as it needs to be away from wave action. The wharf has large fender structures that are higher than the wharf deck, whose purpose is not understood by the Consultant given the vessels using the facility. Furthermore, the fenders are an impediment to easy cargo handling, although it would seem not to such an extent that the wharf doesn't get used. The wharf itself does not have a landing craft access point although there is an old, unusable landing craft ramp site adjacent to the wharf. It could be reconstructed and put back into service. The wharf was rehabilitated in 1998 after suffering cyclone damage in 1994. Currently, it is in reasonable structural condition, and although most of the fenders remain functional, they need to be removed and replaced.

2.3.4 Outer Islands

162. Most outer island ship calls are made directly to a beach or via lightering nearby the origin or destination of the cargo or passengers without the use of any maritime infrastructure, the Litz Litz and Lenakel facilities being the two exceptions. In the outer islands conventional ships use their small boats to lighter cargo and passengers between ship and shore. Landing craft place their bow ramp directly onto the beach where possible. The capacity of beaches is constrained only by the quantity that can be carried in a ship's boat or landed across a bow ramp and the characteristics of the beach and its conditions at a particular time such as tides, weather, etc.

2.4 Competitiveness

2.4.1 Port Vila and Luganville

163. The domestic wharves in both Luganville and Port Vila are operated in accordance with a free market model, each competing for business openly with the others. In the majority of cases, the wharves are owned by private sector interests, except in the case of Simonsen Wharf which is publically owned, although the operator, NISCOL, behaves as one would expect of a private sector owner. As mentioned in Section 2.3.1 above, Port Vila domestic wharf charges are about 76% higher than the charges for the same ship in Luganville.

164. This situation creates some implications for Port Vila. Firstly, Port Vila needs a replacement of the existing berths. Secondly, it needs an increase in supply of berths. Then, if handled right, this will result in a supply and demand balance that will allow the market forces to reduce the prices charged to ship operator users.

165. It was a recommendation of the VISSP1 study that in addressing both these issues, a new wharf facility should be built in Port Vila, wherein it is extremely desirable for competitive market reasons that it be commercially independent of the owners of the existing domestic wharves in Port Vila.[17] The present situation has changed somewhat, however, given that two of the existing wharf sites in Port Vila are to be closed in the near future. A new facility is now urgently needed, and as soon as possible. To meet the demand, and given study timing and expected resource constraints, the recommendations of this report have proposed a one site solution. Given the desire for increased competitiveness and recognising ownership and operational issues, more than one site would be advantageous; although the study also suggests that preferred site locations within Port Vila harbour proper are limited.

2.5 Future Demand

166. The estimated berth-days requirement for 2007 was obtained by inspection of the wharf owners' data. Some ships did lay-up or lay-over during that period, therefore the data was adjusted by imposing an upper limit of 30 hours per ship visit.[18]

167. Growth in demand has been assumed at a 2.5% linear growth rate over the 30 years forecasted. This growth rate has been arrived at by analysing historic data, the VISSP1 analysis, and forecasting the import cargo growth for all of Vanuatu in concert with a simple model of the transhipping involved in the Vanuatu economy.[19]

168. The resulting berth-day requirements have been analysed for the resulting berth occupancy and wait times. The wait time has been estimated using queuing theory, and assuming a random arrival pattern and a cargo handling service time that is described by a 2nd order Erlang distribution. A maximum desirable average wait time has been calculated, based on the relative cost of delaying a domestic ship compared with the cost of constructing an additional berth.[20]

2.5.1 Port Vila

169. The impending closure of all three wharves at Port Vila means the situation has reached critical levels. New capacity is urgently required at Port Vila. The number of general berths that will be required at Port Vila has been calculated at five yearly intervals for a range of ship turnround productivities and is detailed in *Table 2.7*.

[17] Appendix 3, para. 25, *Vanuatu Inter-Island Shipping Study,* McGregor & Company for NZAID, June 2008.
[18] The time that is possible for a ship turnround is likely 24 hours or less. The landing craft *Brisk*, likely a better operated service than most, takes approximately eight hours when conditions are right. Tuvalu's Nivaga II, which is three times larger than the largest vessel in Vanuatu, completes a full turnround in 24 hours. To be conservative, 30 hours has been assumed in the analysis.
[19] The forecast is based on a regression analysis of historic data, taking account of imports, population growth, and exchange rates.
[20] A typical daily cost of delaying a ship has been estimated at Vt43,000 per day. A new berth has been estimated for the purposes of this calculation at Vt200,000,000.

170. A similar analysis of berth-day requirements indicates that two landing craft ramps are need now to cope with the present demand, and that these should be sufficient for at least the next 30 years.

Table 2.7: **General Berth Requirements: Port Vila**

Year	2010	2015	2020	2025	2030	2035	2040
Max no of hours to turn round at Vila	No of General berths required						
12	1	1	1	1	1	2	2
18	1	2	2	2	3	3	3
24	2	3	3	3	3	3	4
30	3	3	3	3	4	4	4
36	3	3	4	4	4	5	5
42	3	4	4	4	5	5	5
48	4	4	5	5	5	5	6

171. In summary, assuming a turnaround time of less than 30 hours:

- A new facility is needed now with a total of three general conventional ship berths. Another general conventional ship berth is required about 20 years from now, making four berths in total. In total, this number of berths should be sufficient for the next 30 years to 2040. Two landing craft ramps are needed now, and these should then be sufficient for at least the next 30 years to 2040.

2.5.2 Luganville

172. At present, Luganville's domestic wharves have sufficient capacity to meet expected demand. In fact, given forecasts, there are at least two berths more than are necessary to meet current operational demands. However, an additional landing craft ramp will be needed in about 20 years, which should then be sufficient until 2040.

2.5.3 Outer Islands

173. The existing transportation method employed by both conventional ships and landing craft is capable of facilitating inter-island shipping and the transfer of cargo and passengers from ship to shore in the future. It is probable that the future composition of the Vanuatu domestic shipping fleet will be very similar to what it is today and has been for the past 20 years or so.

174. An economic based discussion considering Vanutau's economic development issues, previous outer island infrastructure experiences, and potential sea transport infrastructure at outer island sites is presented in Chapter 5.

2.6 Port Vila Concept Wharf

2.6.1 Site Selection

175. Based on the analysis of VISSP1 and current conditions, the TOR for the Project calls for the identification of a representative site in Port Vila for a new wharf facility to be chosen for conceptual engineering design, cost estimating, and consideration from the point of view of the environment and social issues.

176. After conducting an initial review of possible locations within the Port Vila vicinity, five such representative sites were considered and placed through a Strengths-Weaknesses-Opportunities-Threats (SWOT) analysis, and a subjective scoring process. The five sites analysed were:

- An extension to Dinh Wharf;
- A greenfield site either to the east or west of the Main Wharf;

- A reconstruction, of a new facility at the Marine Quay site;
- A site at Malapoa Point at the entrance to Port Vila Bay; and
- A site near the Ifira Star complex, but with ship access from southern Paray Bay rather than Pontoon Bay, the latter of which serves as the access to the existing Star Wharf.

Figure 2.8: **Port Vila Domestic Wharf Site Selection Results of Analysis**

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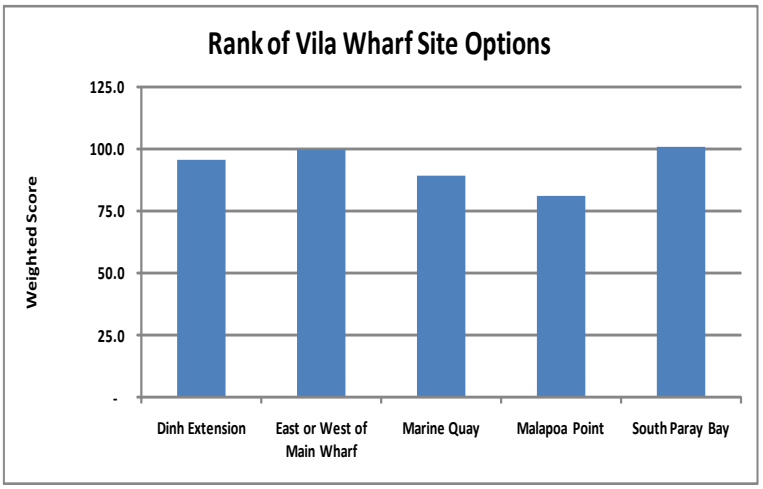
Vanuatu Inter-Island Shipping Support Programme

Port Vila Domestic Wharf Site Selection
SWOT Analysis

			Site 1 **Dinh Extension**		Site 2 **East or West of Main**		Site 3 **Marine Quay**		Site 4 **Malapoa Point**		Site 5 **South Paray Bay**	
Strengths & Weaknesses to consider	*Weighting rank*	*Relative weighting*	*Score*	***Weighted score***	*Score*	***Weighted score***	*Score*	***Weighted score***	*Score*	***Weighted score***	*Score*	***Weighted score***
Demand - Location vis a vis proximity to users' origins and destinations	2	3.5	8.8	9.0	5.1	5.2	6.8	7.0	5.6	5.8	6.0	6.1
Demand - Access to road network	2	3.5	7	7.2	7	7.2	5	5.1	3	3.1	7	7.2
Economic efficiency - Independence from existing wharf owners	8	2.0	1	0.6	10	5.9	10	5.9	10	5.9	1	0.6
Environmental issues	6	4.0	5	5.9	4	4.7	7	8.2	7	8.2	5	5.9
Cultural & social issues	6	4.0	7	8.2	5	5.9	4	4.7	5	5.9	5	5.9
Ship ops - Suitability for ship manoeuvring	2	3.5	7	7.2	10	10.3	4	4.1	4	4.1	10	10.3
Ship ops - Suitability for berthed ships (exposure to wind and wave)	2	3.5	6	6.2	6	6.2	5	5.1	2	2.1	6	6.2
Cargo & pax ops - Suitability for cargo handling	2	3.5	8	8.2	8	8.2	8	8.2	8	8.2	8	8.2
Cargo & pax ops - Suitability for pax embarkation/ disembarkation	2	3.5	8	8.2	8	8.2	5	5.1	8	8.2	8	8.2
Constructability - Existing structure	1	7.5	6	13.2	8	17.6	6	13.2	8	17.6	7	15.4
Constructability - ease of construction	1	7.5	8	17.6	5	11.0	5	11.0	2	4.4	7	15.4
Land use - Existing or new wharf site	5	1.3	7	2.6	6	2.2	6	2.2	6	2.2	6	2.2
Land use - Land value	5	1.3	2	0.7	5	1.8	10	3.7	5	1.8	5	1.8
Land use - Land availability	5	1.3	0	-	5	1.8	10	3.7	5	1.8	10	3.7
Land use - Proximity to other activities (conflicts and complimentarity)	5	1.3	2	0.7	8	2.9	4	1.5	4	1.5	9	3.3
		3.4	82.8	**95.7**	100.1	**99.3**	95.8	**88.9**	82.6	**81.0**	100.0	**100.5**
Ranking				3		2		4		5		1
Ranking as Percentage of Highest Ranked				95%		99%		88%		81%		100%

Relative weighting: Score between 1 & 10, that identifies what weight the item has, relative to the other items
Note, the design and environmental attributes score low, as the design will cover these items, with an appropriate highe
The important items are the external issues.
Score: Score out of 10. 5 is neutral; 1 is poor; 10 is excellent



177. A summary of the results is presented in *Figure 2.8*. The three highest scoring sites are:

- South Paray Bay;

- East or west of Main Wharf; and
- Marine Quay.

178. In thinking about the broader picture of master planning for Port Vila harbour, all three of these sites are compatible with other ongoing or foreseeable port activities. In particular, South Paray Bay and the east or west of Main Wharf options complement other maritime activities such as transhipping and are able to be located such that they do not interfere with overseas shipping including any proposed future development plans.

179. The top scoring option is South Paray Bay, being marginally better than the east or west of the Main Wharf option. Although Marine Quay placed third, it should be reiterated that based on reported information gained during the course of the Project, the Marine Quay site is now not available.

2.6.2 Concept Berth

180. Berth and backup land dimensions for a domestic wharf concept for Port Vila is shown at *Figure 2.9*.

Figure 2.9: **Dimensions: Concept Berths for Port Vila Domestic Wharf**

Port Vila Domestic Wharf

Concept Berth

Requirement	*2010 to 2020*	*2020 to 2030*	*2030 to 2040*
General berths	3	3	4
Landingcraft ramps	2	2	2

Berths				**Sources and assumptions**		
General berths						
Apron width		16	m	Based on Dinh & Star wharves		
Berth Length	Berth #			Loa of 3 largest vessels:	104	m
	1	36	m	Allow 2m between ships	4	
	2	72	m	Berth length for 3 ships	108	
	3	108	m	Berth length per ship	36	
	4	144	m			
Berth pocket depth, min		3.00	m	Max draft of largest vessels is 2.15m. Allowing 15% for UKC, min depth is 2.47m, say 2.5m Siltation allowance of 0.5m		
Landingcraft ramps						
Width		12	m			
Length of slope		10	m			
Apron behind slope		6	m			
Slope		1:8 or steeper				
Max height of edge above LW		1	m	to be lower than the ramp hinge height		
Berth pocket depth, min		2.00	m	Ideally, but can be just the slope of the seabed.		

Back-up land								
Allowance per berth		440	m2	Based on Dinh Wharf	1364	m2 for	3 berths (incl ramp)	455 m2/berth
	Berth # (Incl LC ramp)			Star Wharf	1250	m2 for	3 berths (incl ramp)	417 m2/berth
	2	880	m2				Average	436 m2/berth
	3	1,320	m2				say	440 m2/berth
	4	1,760	m2					
	5	2,200	m2					
Depth of back-up, based on berth length				Facilities			Booth for freight collection	
	Berth # (Incl LC ramp)						Water	
	2	18	m				Electricty	
	3	16	m				Covered store	300m2 (Optional)
	4	15	m					
	5	14	m					
Allowance for access								
Each berth to have road vehicle access that does not cross across the handling area of other berths								
(for example, road to be behind back-up land)								

181. In summary, for Port Vila:

- A new facility should be built incorporating general berths and landing craft ramps.
- Initially the site should have general berths of sufficient total length for three of the larger sized domestic ships and two landing craft ramps constructed.
- When required, in an estimated 20 years time, consideration can be given to the construction of another general berth contingent upon then realized demand.

182. The initial facility should have:

- General berths with a total length of 108 metres, and an apron width of 16 metres;
- Two landing craft ramps, one at each end, that are 12 metres wide and a sloped length of at least 10 metres;
- Water depth at LAT of at least 3.0 metres at the general berths and 2.0 metres at the landing craft ramps;
- Backup land with a total area of 2,200m^2 in addition to the 16m wide apron;
- Suitable road access;
- A passenger shelter with public toilets;
- A freight collection booth; and
- Water and electricity supplies for the use of ships.

183. The site and the design of the facility should allow for an additional one general berth and backup land. The berth extension will be at least 36 metres, giving a total berth length of 168 metres with an apron of 16 metres. The additional backup land will be 440m^2, giving a total backup area of 2,640m^2.

2.7 Outer Island Concept Jetty

2.7.1 Representative Location and Site

184. For the outer islands, it was initially decided to seek a representative location to validate the maritime infrastructure intervention concept. From information collected, the Project Team learned that there was a planning document for the development of Loltong, inclusive of land use zoning, interior road connections, plans for a jetty, ongoing land acquisition, and the formation of a forward looking community association to assist residents in commercial or livelihood enhancement activities and overall guiding the strategic direction of the communities. Hence, Loltong appeared to be a good candidate as a representative location.

185. The bay where the town of Loltong is located is on northwest Pentecost, on the interior coast of the archipelago. In the VISSP1 analysis, the west coast of Pentecost was assessed to have some of the largest cargo volumes transported to and from Port Vila or Luganville, being approximately 7,500 tonnes per annum, thus if jetties in the outer islands are feasible, on this basis, somewhere in west Pentecost is a likely candidate for a jetty, all else equal.

186. Once in Loltong, the Project Team learned that location actually comprised two possible sites. The site, which had been chosen by the local association, was a former jetty located at the Catholic Mission at a place that is more properly called Latano. Upon inspection, this site at Latano may not be ideal since to reach sufficient water depth it would require an approach jetty of some 80 to 90 metres, an expensive proposition. Nevertheless, a full environmental, social, and economic assessment, engineering concept design, and cost estimate has been carried out.

187. In close proximity to Latano, is the village of Loltong proper, which is where the Project Team embarked and disembarked from the boat that had been used to travel down the coast from the airport. The site at Loltong proper is more sheltered than the site at Latano, it is also a recognized place for the anchorage of yachts, and where landing craft currently make ship calls, although the latter cannot always make it completely to the shore. The existence of an earthen causeway at Loltong proper was also evident during the site visit.

188. There are other suitable sites on the west Pentecost coast. For example, the team visited Paangi on the southern end of the coast during VISSP1. Paangi, which is another population centre on Pentecost and has tourism activities associated with land diving, is in a wide bay, and has steeply shelving beaches. A jetty close to the shoreline could be constructed there. Nevertheless, the site visit to Loltong proved useful, but could have also raised the expectations of the local community as to the likelihood of a jetty being constructed for 'their village'.

2.7.2 Concept Facility

189. Given the composition of the Vanuatu domestic inter-island shipping fleet, the maritime infrastructure should cater to cargo and passenger transfer for both landing craft and conventional hulled ships. In general, the concept is to keep capital expenditure to a minimum, consistent with not increasing the overall cost to the users.

190. Consideration in the design of infrastructure to suit landing craft include:

- Possibly independent of jetty head;
- Sufficient depth for ship to access the ramp at both low and high water;
- Mooring points set into bank;
- Needs to be a longitudinal access from the shore;
- Possibly direct onto shore;
- Possibly just use existing beach; and
- Needs to be close by any shore infrastructure for cargo transfer such as storage sheds.

191. Consideration in the design of infrastructure to suit conventional ships include:

- A jetty head with sufficient length for a ship to lie alongside and work one derrick, i.e. about 10 to 15m;
- Sufficient jetty head width for a small vehicle to drive on, but not necessarily for it to turn; and
- Mooring points set into bank, if close enough, otherwise, head and stern mooring points.
- Access jetty needs be only wide enough for one-way traffic.

192. Additionally, consideration in the design of infrastructure common to both should be as follows:

- No need for any water or electrical services since vessels are en route and can obtain water at terminal ports, and night activities can be lit by shipboard lights;
- Shore infrastructure as required by community, for example a storage shed;
- As both a ramp and a jetty are needed, they should be adjacent to each other.

193. Note that cargo volumes per ship visit are typically of the order or three to four tonnes discharged and two to three tonnes loaded. This represents perhaps up to five vehicles that will need to access the jetty head or ramp way.

2.8 Slipway

2.8.1 Capacity & Suitability

194. A slipway or careening grid is necessary in Vanuatu. Many smaller craft that need slipping or careening are too small to cross the open ocean to either of the two closest slipways: Honiara (590 nm from Luganville) or Suva (590 nm from Port Vila).

195. At the Dinh Wharf complex, west of the town of Luganville, there is an existing slipway. It is in poor repair, having been damaged during an earthquake. Its mechanical equipment, the slipway

cradle, its blocks and tackle and the winch do not appear to be in good condition. The foundations of the slip's rails look to have failed. It may need to be reconstructed if it is to be brought back into a suitable condition for ongoing work.

196. A former slipway is located at Pailful, approximately 12 km from the town of Luganville. The site has two former slips, one for vessels up to about 60 tonnes, the other for vessels up to about 400 tonnes. Both appear to be structurally in sound condition. The site could be reinstated. However, it has been anecdotally reported that the site is subject to a major land dispute.

197. Informal careening grids are now in use, and will probably continue to be so.

198. Port Vila is a better location than Luganville for a slipway due to:

- greater selection of engineering facilities;
- more likelihood of obtaining urgent parts, supplies, and materials from local merchants; and
- better international air connections for supplies and parts that need to be air freighted.

2.8.2 Concept Slipway

199. A slipway needs sufficient weight-bearing capability for ships in a light or almost light condition. The larger ships in Vanuatu have a light weight of greater than 100 tonnes, but not greater than about 400 tonnes. The medium to small ships have a light-weight of less than 100 tonnes, some much less.

200. The capital cost of a slipway consists of two main components: the rails plus their foundations, and the cradle plus winch mechanical equipment. Both components can be very expensive, increasing as the size of the ships to be slipped increases. In addition, a pile driving barge is required. This would most probably be mobilised from Australia.

201. A cost estimate for these two sizes of slipway has been obtained, on the basis of the site being ideal for a slipway, i.e. good access from the sea, sheltered from waves, small tidal range, and suitable ground conditions for the foundations.[21] The range of capital expenditure is shown in *Figure 2.10.*

Table 2.10: **Indicative Slipway Capital Costs: Vanuatu**

Slipway Capex	*100 tonne*		*400 tonne*	
USD '000	*Lowest estimate*	*Highest estimate*	*Lowest estimate*	*Highest estimate*
Design / Project Management	60	150	80	240
Plant Mobilisation	525	525	525	525
Piles / Rails	150	600	300	1500
Cradle / Winch / Wires	180	240	400	750
Total	**915**	**1,515**	**1,305**	**3,015**

202. Based on selecting a smaller 100 tonne slipway, but assuming the high cost estimate, the capital expenditure for a slipway suitable for Vanuatu is on the order of US$1.5 million (Vatu 150 million). Vessels of greater weight requiring slipping will still need to sail to either Fiji or the Solomon Islands.

[21] Pers comm.: Harry Stronach, Naval Architect, New Zealand, 31 August 2009

3. Wharf and Jetty Design and Costs

Chapter 3 presents proposed wharf and jetty design specifications bearing in mind previous experience, frequency of use, risk to cyclones and wave action, and, maintenance resources.

The issues and considerations important for wharf and jetty design specifications are:

- **previous wharf designs in Vanuatu have been structures made of coral rock fill and topped with a concrete deck slab made from coral aggregate, which does not meet current international standards;**
- **there has been (and is) a noted lack of maintenance in any form;**
- **given Vanuatu's geographic location, any maritime structure is at risk from severe cyclones and associated wave action;**
- **as a result of the poor design, shoddy construction quality, lack of maintenance and typical environmental conditions, many structures have not survived the duration of their design life;**
- **based on previous experience, the preferred approach to developing design specifications is one of high capital investment cost with a consequential reduction in the need for annual maintenance;**
- **in order to minimise costs, designs do not include the construction of breakwaters or significant dredging;**
- **in order to achieve a 50 year design life, foreign procured labour, equipment, and material need to be used for the majority of the works; and**
- **constructing the proposed domestic wharf at South Paray Bay and the outer island jetties will have few adverse environmental impacts, all of which are either of little consequence or can be safely mitigated.**

It is recommended that:

1. **the wharf and jetty designs accommodate the expected sizes and types of vessels in the Vanuatu domestic fleet; [section 3.1.2]**
2. **wharves and jetties be designed for a 50 year engineering design life; [s3.1.2]**
3. **new wharf facilities in Port Vila be designed and built in accordance with the principles described in the preliminary design and specifications; [s3.2]**
4. **new outer island jetty facilities be designed and built in accordance with the principles described in the representative jetty design and specification; [s3.5 & s3.6]**
5. **the preliminary standard wharf structure for Port Vila and the outer island representative jetty be further studied and designed in detail in accordance with Australian and New Zealand Standards and those of all relevant stakeholders;**

6. **repairs be undertaken to government-owned facilities in the outer islands in accordance with the priority schedules recommended in this report. [s3.8 and see also chapter 2]; and**

7. **the MIPU formalise the establishment of an Environmental and Social Unit and that an international environmental specialist be provided to initially assist with monitoring, auditing and training.**

The estimated costs for a representative wharf in Port Vila and four outer island jetties are:

Representative Wharf and Jetty Costs Costs	*Vt 000s*
Port Vila stage 1: 3 berths + 2 landing ramps (2010)	812,405
Port Vila stage 2: additional general berth (2030)	128,405
Total cost Loltong jetty + 3 other OI Jetties	865,184

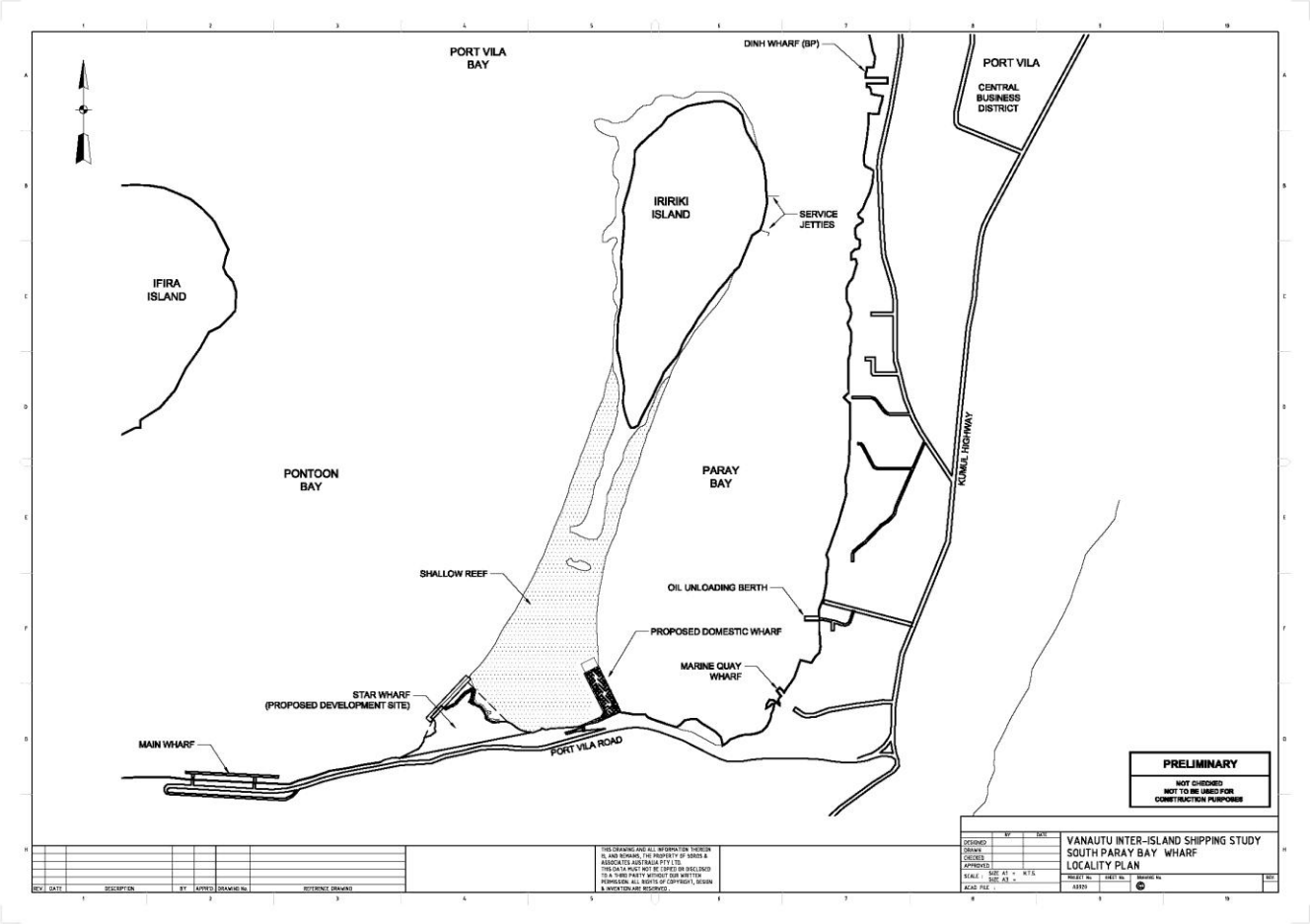
3.1 Port Vila Wharf Design Configuration

203. A key objective of the Project is to provide a conceptual design for a new domestic wharf at Port Vila to improve the ability for inter-island vessels to move cargo and passengers to and from the outer islands. After extensive consultation with stakeholders, the site at the southern end of Paray Bay was selected by using a multi-criteria analysis to rank a list of potential locations in and around Port Vila. It is expected that the conceptual design will progress to a final design stage; and then be implemented using internationally accepted engineering standards plus skilled and adequately resourced construction contractors.

204. Provision for loading and unloading of containers from conventional hulled vessels is beyond the scope of this report. However, limited container transfer is possible by trucks on landing barges on either of the two proposed ramps.

205. A full design report, which provides engineering details, is attached as *Appendix 3.1 - South Paray Wharf Engineering Design Report*.

Figure 3.1: **South Paray Bay Wharf Location Plan**



3.1.1 Engineering Design Criteria

206. AS 4997, *Guidelines for the Design of Maritime Structures* and BS 6349 *Maritime Structures* both **recommend that the design life of a permanent commercial wharf structure of this type should be 50 years**. The aims and assumptions are as follows:

- adoption of a long design life in order to minimize maintenance;
- normal maintenance is undertaken on a regular basis;
- a 50 year design life should be the objective, when designing most elements of the wharf and landing craft structures; and
- design vessels.

207. One conventional hull design vessel (Sarafenua) and one landing craft (Dinh 1) have been adopted for the Project as representative vessels and details of these extracted from the shipping register given in *Table 3.2*.

Table 3.2: **Design Vessels**

Vessel		LOA (m)	Beam (m)	Draft (m)	Deadweight (t)	Passenger Capacity
Sarafenua		40	~6	2.1	120	12
Dinh 1		43	~8	1.8	400	60

208. It may also be necessary to consider other individual vessels operating at particular ports of call for design purposes during the detailed design phase, where a particular vessel is known to operate and which may have specific design requirements, such as a potential cattle barging vessel.

3.1.2 Tides and Setting Out

209. Normal practice for maritime infrastructure design is to use the level of Lowest Astronomical Tide (LAT) as zero Chart Datum. However, with no information available on where LAT occurs at the site, this approach is not recommended for the Project. Since Mean Higher High Water (MHHW) can be readily determined by simple observation during periods of spring tides, **it is recommended that all levels for vertical setting out be measured based on an agreed level of MHHW**.

210. In accordance with AS 4997, *Guidelines for the Design of Maritime Structures*, allowance should be made when considering levels for predicted sea level rise. For a design life of 50 years, this standard recommends an allowance of 0.2m to be considered along with the other determinants such as vessel freeboard, ease of cargo handling, and passenger access.

3.1.3 Channel and Berth Depth, Width and Turning Space

211. Minimum design berth depth at low tide should ideally be selected to include:

- the laden draft of the design vessel at 2.1m;
- an allowance for vessel vertical movement from wave action at 0.3m;
- a further allowance of 15% of the loaded draft, for under-keel clearance (UKC) at 0.3m; and
- a further allowance of 15% of the loaded draft, for berth siltation at 0.3m.

212. Berth depth at low tide should therefore ideally be at least 3.0m.

213. The safe navigable width of all approach channels should be at least three times the vessel beam, or 24m based on PIANC guidelines for navigation channel design. This will need to be increased to four times the standard vessel beam (32m), if significant currents run in the channel. As small tanker vessels and most of the inter-island ships already use the approach channel into South Paray Bay and the Admiralty Chart indicates that the controlling depth is 2.6m at the bar, the site and approach channels are considered to be adequate for all tide use.

214. In circumstances where the vessel needs to turn at or near the berth, a turning space should be available, with adequate depth to operate, as noted above. A turning circle is preferred for safe operation, and **a circle of diameter at least twice the vessel length is recommended**. For the design vessel, this will be 80m, and 86m for the design landing craft vessel. If space for turning is restricted, then a smaller circle, of 1.5 times the vessel length would be an absolute minimum requirement.

3.1.4 Wind and Wave Conditions

215. Wind and wave conditions are characterized by two distinct seasons in Vanuatu. The prevailing winds are east to southeast trade winds. They are most common between May and October when they blow from these directions with a high degree of constancy. The maximum wind speed is 30–40 kph. From November to April there are west to northwest winds; these are usually lighter than the trade winds and less persistent, however, cyclonic disturbances also occur during this period.

216. As the site is almost completely protected from waves from the east and southeast trades, cyclone generated swell and wind waves and waves from westerlies will have the most important effect on the wharf structures. The site is more protected than the adjacent Star Wharf and equally as protected as the Dinh Wharf and both these wharves are satisfactory for small ships in all, but cyclonic conditions.

3.1.5 Berthing and Mooring

217. The design vessel is assumed to be able to berth alongside the wharf structure in a normal controlled fashion, under its own power and with little or no assistance from mooring lines to arrest its approach.

218. Based on AS 4997, *Guidelines for the Design of Maritime Structures*, a commercial vessel of 120 tonnes is expected to have a typical berth approach velocity of 0.20m/sec in a mild exposure situation, or 0.25m/sec in a moderately exposed situation. For fender design, using the PIANC Guidelines (2002), **it is therefore recommended that an approach velocity of the design vessel of 0.25m/sec will be adopted** for design of wharf fenders as a conservative approach.

219. BS 6349 Maritime Structures – *Part 4: Design of Fendering and Mooring Systems*, **recommends that bollards with 100 kN capacity will be adequate** for mooring a vessel of up to 500 displacement tonnes under sheltered conditions. This includes provision of bow and stern line bollards located on the wharf for conventional hull vessels and at the ramps for landing craft.

3.1.6 Design Loads

220. Design loads and loading combinations for structural design of the wharf and approach structures shall be determined in accordance with the appropriate international standards, including:

AS 4997	Guidelines for the design of maritime structures
AS/NZS 1170	Structural design actions
BS 6349	Maritime structures
AS1170.4-1193	Minimum Design Loads on Structures Part 4 – Earthquake Loads

3.1.7 Assumptions

221. The conceptual engineering design for the wharf design has been developed by making a number of assumptions:

- in order to ensure that the design life criteria of 50 years is met, local labour and locally-sourced structural materials, except where specifically appropriate, will not be used for construction of the works;
- protection from excessive sea state by providing a breakwater or other protective structure at the site are not be considered or included in the works, because of the high additional cost;
- dredging of approach channels and for navigable depth at berths are not included except for minor localized areas which can be excavated by land-based plant;
- adequate depth, channel width and turning space is considered to be available for navigation, berthing and manoeuvring within the natural channels and seabed profile in the vicinity of the site;
- internationally accepted engineering standards of design and construction will be used for all infrastructure; and
- steel sheet piling is the preferred option for a substructure for the wharf face and for the sides and toe of the landing ramps.

3.1.8 Investigations for Design

222. Before detailed design can commence, the following detailed investigations are normally undertaken during the detailed design and feasibility study phase.

- hydrographic survey to confirm that adequate water depths and channel access and navigability are available and assist in confirming the optimal location and alignment for the wharf;

- landside feature and engineering survey of the area where the wharf complex proposal joins the foreshore, to obtain level information for the design of the reclamation and the road access; and
- geotechnical investigation of the wharf site is necessary to provide subsoil information for the design of the sheet piling, the optimal location and the alignment for the wharf and for the design of the reclamation and protecting revetment walls.

3.1.9 Wharf and Reclamation Layout

223. The proposed general layout of the wharf complex design has been adapted from the 2003 ADB funded *Master Plan for Port Vila Inter-Island Shipping Wharf*. Within an economical structural form, this layout provides for:

- adequate wharf face and deck area for three berths for conventional hull vessels, both for cargo handling and passenger embarkation and disembarkation;
- adequate backup land for cargo handling;
- a passenger shelter with amenities, roads, parking and other services;
- two ramps for landing craft and backup land for cargo handling; and
- sufficient land for an additional building which could be used as a cargo shed.

224. Facilities such as office buildings, a commercial slipway, a quarantine station, a container yard with provision for refrigerated containers have not been included in the design. Only very limited land is available within the reclamation for any future development of these facilities. However, there is scope for a second development stage of one additional berth and back up land for cargo handling and storage.

225. The general form of the wharf design will be a steel sheet piled wall with a concrete edge beam for the berthing face and working apron, a reclamation protected by a precast concrete slab revetment to provide back-up land for a wharf apron, and a hardstand for cargo handling and passenger access. Two ramps for landing craft will provide improved levels of service that presently exist at the Star Wharf complex and the Dinh / BP Wharf. Preliminary design drawings with layout, site and cross section information are attached to *Appendix 3.1, South Paray Wharf Engineering Design Report.*

226. The height of the deck for the wharf needs to be set in accordance with the recommendations in AS 4997 – 2005 – Guidelines for the Design of Maritime Structures. Factors to be taken into account include:

- the freeboard, or the height of the main deck above the waterline, of all vessels operating at the wharf in the laden and unladen states;
- cargo handling requirements;
- passenger access requirements; and
- environmental factors such as the tidal range at the site, the wave climate, storm surge and sea level rises.

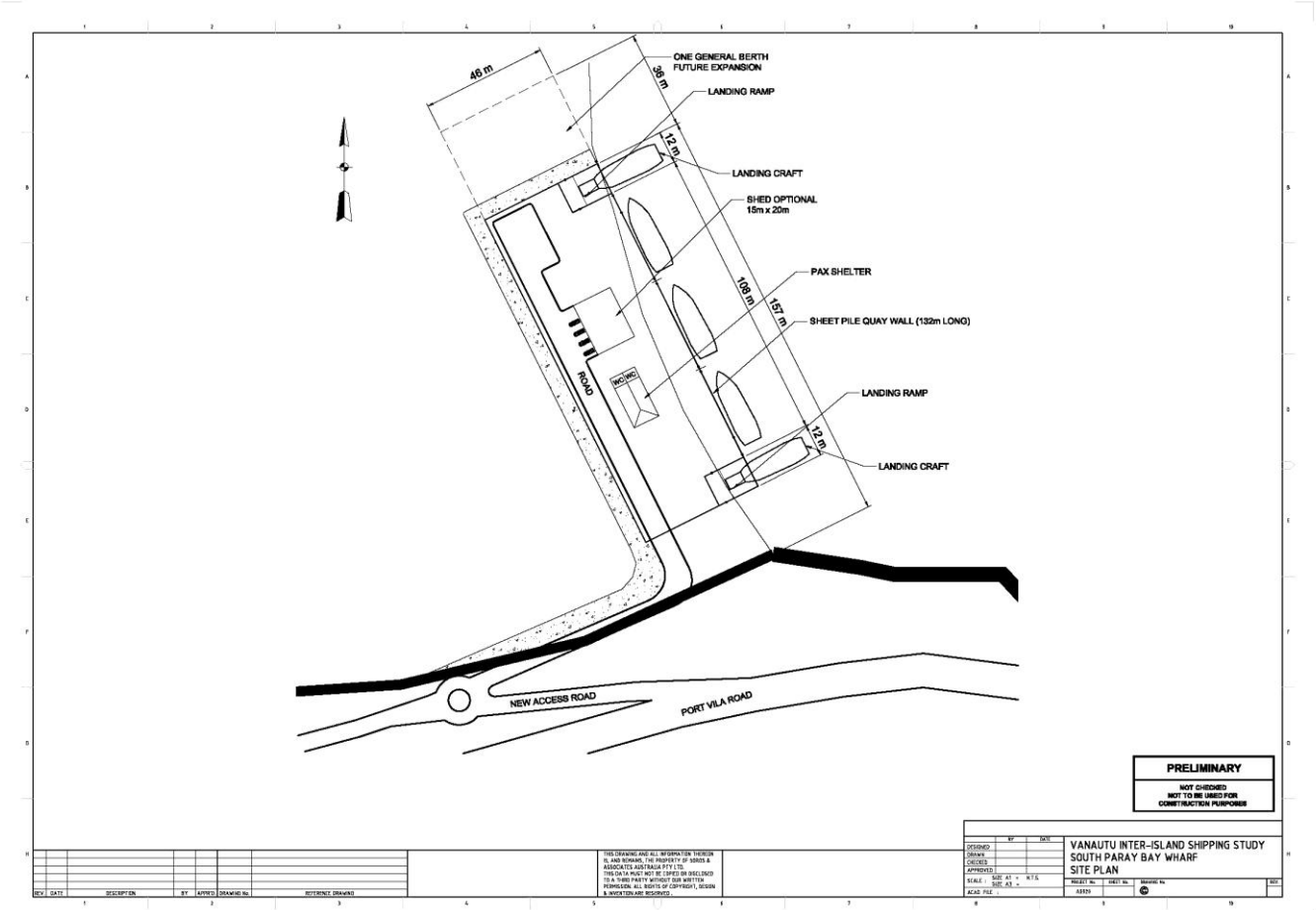
227. For the site and design vessel, a good compromise is for the deck height to be set at 1.5m above Mean Sea Level (MSL), which is approximately 0.8m above the latest chart datum. This would provide a minimum wharf deck height of 0.7m above the Highest Astronomical Tide (HAT) and 2.3m above the Lowest Astronomical Tide (LAT) or chart datum.

228. A further factor to be considered when setting the height of the deck is the prediction of sea level rise. Based on advice from the Intergovernmental Panel on Climate Change (IPCC), AS 4997 recommends considering an allowance of 0.2m for structures with a design life of 50 years. However, with the vessel freeboard criteria setting the wharf height of 2.3m in this case, it would therefore not be prudent to increase the final agreed height of the deck by a further 0.2 metre and have vessels sitting too low against the berth in the early years of operation.

229. Port Vila Mean Sea Level changes and any IPCC recommendations on allowance for sea level rise should be reviewed at the time of final detailed design.

230. The main area of the wharf should be a straight wharf face 108m in length with an apron 16m wide to provide three berths, each being 36m in length. A ramp at either end of the berth face should be provided to maintain the two berth capacity presently at Star Wharf. This layout provides flexibility for more than three ships to use the main berth face should the ramps for landing craft be unoccupied. The general plan layout of the wharf design and associated land facilities is illustrated below.

Figure 3.3: **South Paray Bay Wharf Site Plan**



3.1.10 Pile Layout and Capacity

231. Final alignment of the sheet piled wall should be confirmed during detailed design taking into consideration geotechnical conditions, berth face depths, wharf apron loadings and seismic survey data.

232. To obtain sufficient pile load capacity to carry the vertical and horizontal design loads, it is expected that all piles will be driven into the seabed for a minimum penetration of 6m in soft driving conditions. Detailed design will ascertain the driving capacity needed to satisfy the structural requirements for the wharf design and the anchor system necessary to withstand horizontal loads.

3.1.11 Reclamation

233. Based on the proposed wharf complex, the existing reclamation and foreshore, a reclamation needs to be provided over the shallow reef. In a typical design, the perimeter of the reclamation can be protected by using a steel sheet pile vertical wall, backfilled to create the reclamation. This arrangement is not considered to be ideal at Port Vila because shallow water exists on one side of the site and berthing capacity on all sides will not be possible unless expensive dredging is carried out on one side. While vertical sheet pile wall would be effective in providing protection to the reclamation from erosion due to wave action, a different arrangement is proposed for this wharf design.

234. Erosion of the foreshore through wave action from cyclones has been an ongoing problem in parts of Paray Bay in the past. Soundly engineered measures are therefore needed to ensure the long-term stability and resistance to erosion of the reclamation. This can be achieved by providing a concrete armoured slope, which has its front edge at a relatively high level on the reclamation and the toe on the seabed. This will then avoid most of the erosion forces from wave action causing damage to the reclamation although overtopping could be possible in storm surge conditions.

235. The general arrangement of the reclamation is shown in the drawings in *Appendix 3.1*, *South Paray Wharf Engineering Design Report.*

3.1.12 Concrete Structural Components

236. The top working face of the wharf comprises a concrete edge beam fixed to the sheet piled wharf face. This continuous beam provides rigidity to the wall and a working surface for cargo handling and for the attachment of bollards. Apart from anchor blocks for the sheet piling no other in-situ cast concrete work requiring expensive formwork over or in water is planned.

237. The revetment slab lengths will be determined during the detailed design stage to allow for the varying depths across the reclamation. However, to achieve cost efficiencies it would be envisaged that:

- base dimensions would be 1200mm in width and 170mm thick;
- slabs would be reinforced concrete;
- they should not contain any prestressing, as this would compromise the durability of the units;
- slabs would need to be designed to carry the temporary construction loads in a simply-supported mode; and
- slabs should have fittings provided to facilitate lifting them into position, to avoid damaging them from lifting chains, hooks or slings.

3.1.13 Construction

238. Pile material is expected to be procured from Australia, and is normally supplied in 12m lengths. When they are driven into the seabed there should be sufficient length to reach the soffit of the wharf face edge beam in the expected water depth needed for the design vessel.

239. Pending geotechnical investigation of the site, it will be prudent to start construction by driving a test pile. This test pile can be located in a permanent pile location, and needs to be driven to the specified penetration and pile ultimate driving capacity as determined by detailed design. It may be necessary to test this pile using a static load bearing test to confirm the capacity of the pile.

240. The driving of this test pile will provide the necessary driving information needed to ascertain the driving requirements for the remaining piles for the structure. In the event that the test pile cannot be driven to the design penetration or capacity, action can be taken to re-evaluate measures to achieve capacity.

3.1.14 Concrete Edge Beams and Revetment Slabs

241. All concrete revetment slabs will be precast reinforced concrete. A central precast yard will need to be set up, with facilities for storing concrete materials in accordance with the appropriate standards, facilities for manufacturing concrete and for curing and storing all concrete components ready for shipment to each construction site. Facilities for making test samples are also needed.

242. It is not expected that edge beams will be precast as maximum bonding with the sheet pile wall will be required and this will be best achieved by cast in-situ work.

243. Some emphasis needs to be placed on establishing a conforming concrete mix design in accordance with the requirements of the specification and international standards, and subsequently on the proper curing of all completed concrete components, to ensure that adequate concrete strength and density is achieved.

244. A regular testing program for all materials and concrete test samples must be established and the requirements of the relevant standards adhered to during construction. Conformance with all testing and quality control requirements will be a major contributor to ensuring that the best possible durable concrete is delivered to the project.

3.1.15 Other Concrete

245. Concrete is needed in-situ for the landing ramp, concrete anchors for the sheet piled wall, for bollard foundation blocks and for building slabs. Most of this in-situ concrete is structural in nature, and therefore must be mixed and placed to the highest quality and standards achievable.

246. It is recommended that materials needed for in-situ concrete such as cement, aggregates and admixtures should be sourced in Port Vila, or another central location, to enable quality control to be maintained for these materials, which can then be packaged and dispatched to each construction site for mixing. Controlled batching of this concrete, to an approved mix design demonstrating conforming strength properties, will need to be implemented at each site and adequate test sampling conducted to ensure satisfactory concrete quality. Proper curing of in-situ concrete once placed is essential to achieve adequate concrete quality.

3.1.16 Wharf Furniture

247. It is recommended that the wharf design incorporates properly designed proprietary marine elastomeric fenders fitted to the front face of the wharf structure, so that vessels are well protected during berthing for all states of the tides and the sheet pile wall and protective coating system are protected from wear by vessels.

248. An appropriate fender would be an arch fender such as those manufactured by Trelleborg, Bridgestone, Marubeni or similar supplier, fitted vertically to the front face. This will require the edge beam to be configured to include a suitable fender mounting panel. Each arch fender would be about 2m in length, and mounted at 5m centres on the sheet piled wall. Fenders would also be required on the landing craft barge ramp wall returns. These fenders should be designed in accordance with the PIANC Guidelines, using the expected vessel berth velocities. All fenders should be fixed to the wharf with stainless steel fixing bolts for maximum durability.

249. Mooring bollards of 100 kN capacity are needed for securing vessels at the wharf. Bollards will be mounted on the concrete edge beam as indicated on the conceptual drawings presented in *Appendix 3.1, South Paray Wharf Engineering Design Report*. These shore bollards will secure the main bow and stern lines, while the bollards on the ramps will be used for bow lines. For durability and strength, the bollards should be proprietary items and manufactured from ductile cast iron. Holding down bolts should be galvanised and set through the deck for easy replacement in the event of bolt failure.

3.1.17 Revetment and Temporary Causeway

250. It is expected that a temporary causeway could be constructed to allow an early commencement of pile driving by conventional land based rigs. However, a contractor may choose to drive the sheet piling wall from floating plant should it be available locally.

251. If floating plant is used, construction of the reclamation and revetments can occur concurrently. This will allow ready access to the front sloping face of the reclamation, which needs to be protected using the necessary erosion prevention measures specified.

252. Geotextile material is recommended to be used beneath the revetment to prevent suction of fine material out of the fill, which would otherwise result in collapse of the revetment. For the main body of fill for the revetment, coral rubble is a suitable material, although considerable effort will be required to be given to compacting the material to minimise settlement and deformation of the pavement material.

3.1.18 Pavement and Seal Material

253. Because of the high cost of importing road pavement material, it is envisaged that locally supplied coral pavement material will be used together with 50mm of asphaltic concrete seal.

254. However, geotechnical testing at the detailed design stage will be necessary to determine the required thickness of pavement material. A pavement design of 300m has been used in the estimates.

3.2 Port Vila Material Specifications & Costs

255. All construction materials must be selected with the primary aim of providing long-term durability of the completed wharf structure, which as a consequence should require minimal or no maintenance over the life of the structure. The selection of materials is also highly dependent on availability and lead times for delivery, particularly of imported materials.

3.2.1 Concrete

256. Most international standards, including AS 4997 and BS 6349, recommend concrete with a characteristic compressive strength of at least 40 MPa, and preferably 50 MPa, for marine structure concrete. In addition, minimum cementitious materials such as cement, fly ash, etc. should be 400 kg/m^3 of concrete for adequate concrete durability and as follows:.

- aggregate size will normally be 20mm, although for confined spaces, 10mm aggregate may be preferred;
- sand must be clean, and in particular must be washed to remove any traces of salt, if the sand is sourced from close to the coast; and
- coral is not suitable for concrete aggregates in structural concrete.

257. In order to achieve the best possible quality in concrete structural components, advantage should be taken of precast concrete as much as possible. Precast concrete components can be manufactured to much higher standards and to more rigid quality controls than in-situ cast concrete, this will enhance the overall durability of the completed wharf structure. All precast concrete components should be manufactured in a dedicated precasting yard at a central location, to take advantage of consistent reinforcement and formwork assembly, and strict quality control of concrete mixing, placing and curing.

258. Even if all opportunities are taken to utilize precasting for much of the wharf structure, some in-situ cast concrete will still be needed in the construction of each wharf structure. **It is recommended that all materials needed for the mixing of in-situ cast concrete, including cement, coarse and fine aggregates, be sourced from a central location, e.g. Port Vila, to ensure consistent materials and concrete quality**.

3.2.2 Reinforcement

259. The primary mechanism for deterioration of concrete maritime structures is corrosion of the reinforcement, leading to premature spalling (breaking up) of the concrete and hence loss of structural integrity.

260. It is therefore recommended that all carbon steel reinforcement comply with AS/NZS 4671 (or similar standards) and be used and fabricated in accordance with AS 3600 and the relevant provisions of AS 4997-2005.

3.2.3 Piles (Sheet Piling)

261. The geotechnical conditions at the site are expected to be coralline, with the possibility of some reasonably hard material within the depth needed to drive piles. Moreover, seismic conditions also exist and sheet piling type construction has withstood these conditions reasonably well in Vanuatu. From a structural perspective the most efficient steel pile section for carrying both axial compression and bending loads is the circular tube section. However, in recognition of the conditions it is recommended that sheet piling with anchors be used to provide the wharf face.

262. It is recommended that corrosion protection measures be used for sheet piles. Protective coatings should be applied to the steelwork exposed to the tidal range and splash zone before pile driving and any damaged coating patch painted after driving.

263. While the best coating systems usually have only a design life of 20 years, the loss of steel section due to corrosion after that period should be calculated during detailed design to determine if additional protective systems are required after the 20 year period.

3.2.4 Cost Estimates

264. A detailed cost estimate has been prepared for the wharf design. This estimate is in three main parts. The first part covers contract preliminaries and mobilisation and is based on using land based piling driving equipment. Preliminaries include costs of:

- insurances;
- performance bank guarantee;
- advance payment bank guarantee;
- site office and services for the engineer;
- contractor's site facilities and maintenance thereof;
- mobilization;
- final demobilization;
- site supervision and associated management costs;
- provision of clearance/debris surveys for the site (3m x 3m grid); and
- other fixed charges items required by tenders not included above.

265. The second part of the cost estimate covers the capital works for the wharf, wharf furniture, barge ramps, reclamation, roadwork, passenger building and services.

266. Typical rates (costs per unit) for both the first and second parts of the estimate have been obtained primarily from the Master Plan and have been updated for inflation and checked against industry common rates for similar work in the South Western Pacific Islands.

267. Details of the preparation of the cost estimate are contained in *Appendix 3.2 - South Paray Wharf Capital Cost Estimate Commentary*. The total estimated capital cost for the project therefore comprises the estimate for the preliminaries, plus the estimate for the proposed wharf and reclamation. Allowances for design, project management including contract administration and price contingencies have been included in this cost estimate.

268. *Table 3.4* provides detailed bill of quantities prepared for the facilities and applicable rates to arrive at an estimate for the initial Port Vila wharf design (three berths and two landing craft ramps) – stage 1. *Table 3.5* details these costs for extending the wharf to accommodate an extra berth (envisaged in 2020) – stage 2. The estimated cost of Stage 1 (2010) and Stage 2 (2020) are:

Stage 1 (2010)	Vt812,404,750	USD8,124,048
Stage 2 (2020)	Vt128,405,050	USD1,284,050

Table 3.4: **South Paray Wharf Cost Estimate**

Stage 1 (2010): 3 Berths & 2 Landing Craft Ramps

Item	Description	Unit	Quantity	Rate Vatu	Amount Vatu	Foreign proportion	Foreign Vatu	Local Vatu
1	Mobilisation to site, preliminaries and provision of major equipment items	Item	100%	10,000,000	10,000,000	75%	7,500,000	2,500,000
2	Place and compact imported fill to reclamation area and roadway	Cu m	33,754	2,000	67,507,000	0%	-	67,507,000
3	Construction of sheet piled seawall with capping beam	L m	200	1,125,000	225,000,000	75%	168,750,000	56,250,000
3A	Install "D" mould rubber fenders 1.0 m high to face of wall	No	39	150,000	5,850,000	75%	4,387,500	1,462,500
4	Install 5.0 tonne SWL cast iron bollards on wall capping beam	No	14	230,000	3,220,000	75%	2,417,800	802,200
5	Construction of barge landing ramp	Item	2	40,000,000	80,000,000	50%	40,000,000	40,000,000
6	Precast concrete armoured slope to temporary revetments inc road approaches	L m	247	575,000	142,025,000	50%	71,012,500	71,012,500
7	Paving to roads, hardstand (300 mm coral) with 50 mm asphaltic concrete seal	Sq m	6,976	2,875	20,056,000	10%	2,005,600	18,050,400
8	Dry cargo storage building (400 tonne capacity	Item		17,500,000	-	50%	-	-
9	Other buildings:	Item						
	(a) Passenger waiting and amenities building		1	10,000,000	10,000,000	50%	5,000,000	5,000,000
	(b) Gatekeepers building	Item	1	2,000,000	2,000,000	50%	1,000,000	1,000,000
10	Services- water supply, ,electricity, lighting, sewage, garbage disposal	Item	1	23,000,000	23,000,000	0%	-	23,000,000
	Sub-total				588,658,000	51%	302,073,400	286,584,600
11	Engineering Design Fees 10%			10%	58,865,800		30,207,340	28,658,460
12	Estimated Tender Price				647,523,800	51%	332,280,740	315,243,060
13	Project Administration 15%			15%	97,128,570		49,842,111	47,286,459
14	Construction Contingencies 10%			10%	64,752,380		33,228,074	31,524,306
Estimated Construction Cost		Vatu			809,404,750	51%	415,350,925	394,053,825
		USD		100	8,094,048		4,153,509	3,940,538
Land acquisition cost		Ha	0.10	30,000,000	3,000,000	0%	-	3,000,000
Total Project Cost		Vatu			812,404,750	51%	415,350,925	397,053,825
		USD		100	8,124,048		4,153,509	3,970,538

Notes: The budget does not include the following costs:

1 Royalties on fill material

2 Service costs do not include headworks charges or off site costs

Table 3.5 – **South Paray Wharf Cost Estimates**

Stage 2 (2020): 1 Extra Berth

Item	Description	Unit	Quantity	Rate Vatu	Amount Vatu	Foreign proportion	Foreign Vatu	Local Vatu
1	Mobilisation to site, preliminaries and provision of major equipment items	Item	100%	10,000,000	10,000,000	75%	7,500,000	2,500,000
2	Place and compact imported fill to reclamation area and roadway	Cu m	6,217	2,000	12,434,991	0%	-	12,434,991
3	Construction of sheet piled seawall with capping beam and fenders	L m	21	1,125,000	23,625,000	75%	17,718,750	5,906,250
3A	Install "D" mould rubber fenders 1.0 m high to face of wall	No	6	150,000	900,000	75%	675,000	225,000
4	Install 5.0 tonne SWL cast iron bollards on wall capping beam	No	4	230,000	920,000	75%	690,800	229,200
5	Construction of barge landing ramp	Item	-	40,000,000	-	50%	-	-
6	Precast concrete armoured slope to temporary revetments inc road approaches	L m	70	575,000	40,250,000	50%	20,125,000	20,125,000
7	Paving to roads, hardstand (300 mm coral) with 50 mm asphaltic concrete seal	Sq m	1,028	2,875	2,955,500	10%	295,550	2,659,950
8	Dry cargo storage building (400 tonne capacity	Item	-	17,500,000	-	50%	-	-
9	Other buildings:	Item						
	(a) Passenger waiting and amenities building			10,000,000	-	50%	-	-
	(b) Gatekeepers building	Item		2,000,000	-	50%	-	-
10	Services- water supply, ,electricity, lighting, sewage, garbage disposal	Item	0.10	23,000,000	2,300,000	0%	-	2,300,000
	Sub-total				93,385,491	50%	47,005,100	46,380,391
11	Engineering Design Fees 10%			10%	9,338,549		4,700,510	4,638,039
12	Estimated Tender Price				102,724,040	50%	51,705,610	51,018,430
13	Project Administration 15%			15%	15,408,606		7,755,842	7,652,764
14	Construction Contingencies 10%			10%	10,272,404		5,170,561	5,101,843
Estimated Construction Cost		Vatu			128,405,050	50%	64,632,013	63,773,037
		USD		100	1,284,050		646,320	637,730
Land acquisition cost		Ha		30,000,000	-	0%	-	-
Total Project Cost		Vatu			128,405,050	50%	64,632,013	63,773,037
		USD		100	1,284,050		646,320	637,730

3.3 Port Vila Wharf Maintenance and Repairs

269. As described above, the design life selected for this wharf project is 50 years. There is a clear expectation that maritime structures of this nature cannot remain serviceable for such a period of time without receiving some attention to maintenance. While every effort should be made at the design phase to achieve a highly durable structure, it is inevitable that some maintenance will be needed over the life of the facility.

270. It is highly unlikely that hardware such as fenders and bollards can survive for such a long period of time without being damaged. It is probable that fenders will be damaged due to abnormal berthing events, and a life of ten years for proprietary elastomeric fenders is a reasonable expectation. Allowance should therefore be made for complete replacement of all elastomeric fenders on the wharf every ten years. It is also expected that mooring bollards may be damaged through misuse or overloading. Accordingly, an allowance to replace one bollard per site every ten years is a reasonable safeguard.

271. Some mechanical damage to the wharf edge beam concrete and the ramp is expected over the life of each wharf structure. The calculation of maintenance costs includes an allowance for expending 5% of the initial concrete cost, and 10% of the initial pile concrete sleeve cost, every ten years on repairs to these areas of each wharf.

272. To ensure that any other damage sustained to a wharf is identified and measures taken to repair the damage, a program of regular condition surveys and assessments of all wharf sites should be undertaken every five years. These condition assessments should include a detailed inspection of the entire structure, including the piling down to seabed level. This will require the services of a diver with the necessary skills to identify any damage to the structure. Action should then be taken

immediately to effect repairs of any damage identified in these surveys. In addition to these five year surveys, ad hoc reports of damage to any of the structures should trigger an immediate response for repairs, to prevent the acceleration of deterioration through neglect of the damage.

273. Overall, these items amount to an average annual expenditure of Vt962,000 or 0.98% of the estimated capital expenditure. This has been rounded to 1% for the economic analysis. Estimated costs for maintenance are included as a separate item in the cost estimate in *Appendix 3.2 - South Paray Wharf Capital Cost Commentary*.

274. These observations and safeguards or provisions, in their entirety, also directly apply to outer island jetties.

3.4 Port Vila Wharf Environmental Assessment

275. An environmental assessment of the South Paray wharf site in Port Vila was undertaken to meet potential donor funding requirements. This section is a shortened version of the environmental assessment. A summary of the initial environmental examination (SIEE) for South Paray Bay is contained in *Appendix 3.5, Marine Quay Wharf (Port Vila) Engineering Investigation Report*. The full Initial Environmental Examination (IEE) is attached to the report as *Appendix 3.11 – Initial Environmental Examination (IEE): Construction of the Inter-Island Wharf at Port Vila, Vanuatu*.

276. The marine ecosystem at the wharf site is located on a shoal that is about 770m long and separates Pontoon Bay and Paray Bay. The shoal is submerged at all times with the top of the shoal varying in depth from 0.3m–2.0m. At the edges of the shoal it falls away quickly to 30m-40m depth. Extensive coral deposits have formed on the northern end of the shoal, which is shallowest while the southern end has built up from sediments on which some scattered coral heads have established. The wharf will extend out 157m on to the southern part of the shoal. As the site has developed on sediments, the marine ecosystem is not particularly diverse and mainly consists of sand, dead coral and discarded rubbish. The Black Sea Urchin occurs on the shoal and is in an indicator of poor water quality and impaired marine health. There are a few insignificant reef fish. There are no sea grass beds or mangroves within the proximity of the site. There are no marine conservation areas in the harbour. Fishing is not carried out in the vicinity of the shoal.

277. Five possible wharf sites were considered within Port Vila harbour. Of these, three existing wharf sites were unable to be selected because of changes in their status and a fourth, Malapoa Point, unsuitable from both an engineering and ship operations perspectives. Consequently, the site at the head of Paray Bay was chosen for evaluation.

278. The siting of the wharf will reclaim about 4% of the area of the shoal at its deeper end, occupy 17% of the length of the shoal and about 53% of the vertical water volume above the shoal. Due to the sheltered location of the site, longshore currents are not evident and no sedimentation build up on the wharf is expected. Furthermore as no dredging of the shoal is required no new channels will be provided and the shoal will continue to separate the water bodies of Pontoon and South Paray bays. While the reclamation will occupy 0.7 ha of the shoal and will cause the total loss of sessile benthic communities it will not be possible to mitigate this loss. The benthic communities are not significant. Mobile marine life will be able to move away from the reclamation area. The location of the reclamation will not affect small boat operators in terms of reduced water depth and small boat operators will be able to continue to pass the wharf as before without any restriction.

279. During the design and pre-construction phase, attention will need to be given to mitigating concerns related to: (i) considering climate change in the design; (ii) the need to establish passenger numbers so as to adequately design the passenger terminal and its services; (iii) provision of a small quarantine area to inspect cargoes arriving from high risk areas; (iv) the need to include footpaths along the access road to facilitate the safe movement of passengers between the road and the wharf; (v) payment for the acquisition of about 0.2 ha of land; (vi) the inclusion of the Environmental Monitoring and Mitigation Plan (EMMP) conditions in the bid and contract documents to ensure that the EMMP is addressed; and (vii) the provision of environmental criteria to select the contractor. [22]

280. Construction is estimated to take 12 months of which the main impact will be noise and vibration resulting from driving the sheet steel piles and compacting about 42,500m^3 of fill. Activities that are required to be addressed during construction include the following: (i) the preparation of a

[22] Fire ants are a case in point. These have established in the northern islands and their spread to other islands should be contained.

SEMP which will outline how the contractor will address the requirements of the EMMP, (ii) the induction of the contractor to the site and the verification of the SEMP terms will be a pre-requisite before the contractor can commence work; (iii) the extraction of a large amount (42,500m^3) of fill material which will need to comply with GoV quarry practices; (iv) the storage and handling of materials fuel and lubricants - no refuelling is to be done within 10m of the marine environment and a fuel spill contingency plan is to be developed by the contractor; (v) noise from pile driving will be a major concern and could last for 3-4 months - the closest habitation to the site is 70m distant and is unlikely to be severely affected.; (vi) turbidity will increase around the source of the pile driving and from placement of fill, this will be contained by a floating silt screen while a geotextile membrane will be positioned between the sheet pile and the fill to prevent fill moving into the marine environment; (vii) increased road traffic will result from an additional 7,000 truck loads of fill being hauled along Port Vila roads and will be addressed by a traffic management plan; (viii) the contractor will be required to implement a workplace health and safety program; and (ix) at the completion of construction the contractor is to dispose of all waste to an approved landfill, remove all equipment and arrange the rehabilitation of the site.

281. When required, the wharf will operate 24 hours a day. Operational impacts that were considered showed that there would be a slight but insignificant increase in shipping traffic within the Paray channel leading to the wharf and a similar effect on road traffic. A wharf maintenance program is needed to protect the investment in the wharf. Arrangements need to be made to collect and dispose of waste from the ships and a quarantine inspection service needs to be be instituted at the wharf to verify high risk cargoes. Details of expected impacts, mitigating measures and monitoring programs are provided in *Appendix 3.6 - Environmental Management and Monitoring Plan for South Paray Wharf*.

282. A major public consultation meeting was arranged to which government officials, ship owners, NGOs and the broader community were invited. The consultation showed that there is good public support and agreement for the project which is strongly supported by the stakeholders who confirm the importance of the wharf with regard to the critical situation that is unfolding in Port Vila for inter-island shipping.

283. Based on a review of documents, discussions and field assessment, it is concluded that the project will have few environmental impacts, all of which can be mitigated. The project has strong stakeholder support in both Port Vila and the outer islands. The construction of the wharf will require the reclamation of 0.7 ha of a shallow submerged shoal, which will cause the irreversible loss of non-significant benthic communities in this area. The loss is acceptable with regard to the size of the communities. The wharf will not exacerbate sedimentation either within the bay or alongside the structure. All other impacts have been identified and analyzed and the remaining impacts have been assessed as being inconsequential or can be mitigated. The direct costs of the EMMP are US$64,330, which includes costs of monitoring and provision of consulting services.

284. The IEE concludes that that all of the environmental impacts that have been identified are either of little consequence or can be safely mitigated. The project will not result in any direct significant adverse environmental impact. As shown in the *Appendix 3.6 - Environmental Management and Monitoring Plan: South Paray Wharf*, all potential environmental concerns can be adequately mitigated and monitored. The IEE will be the final environmental assessment for the project.

3.5 Outer Islands Jetties Design Considerations

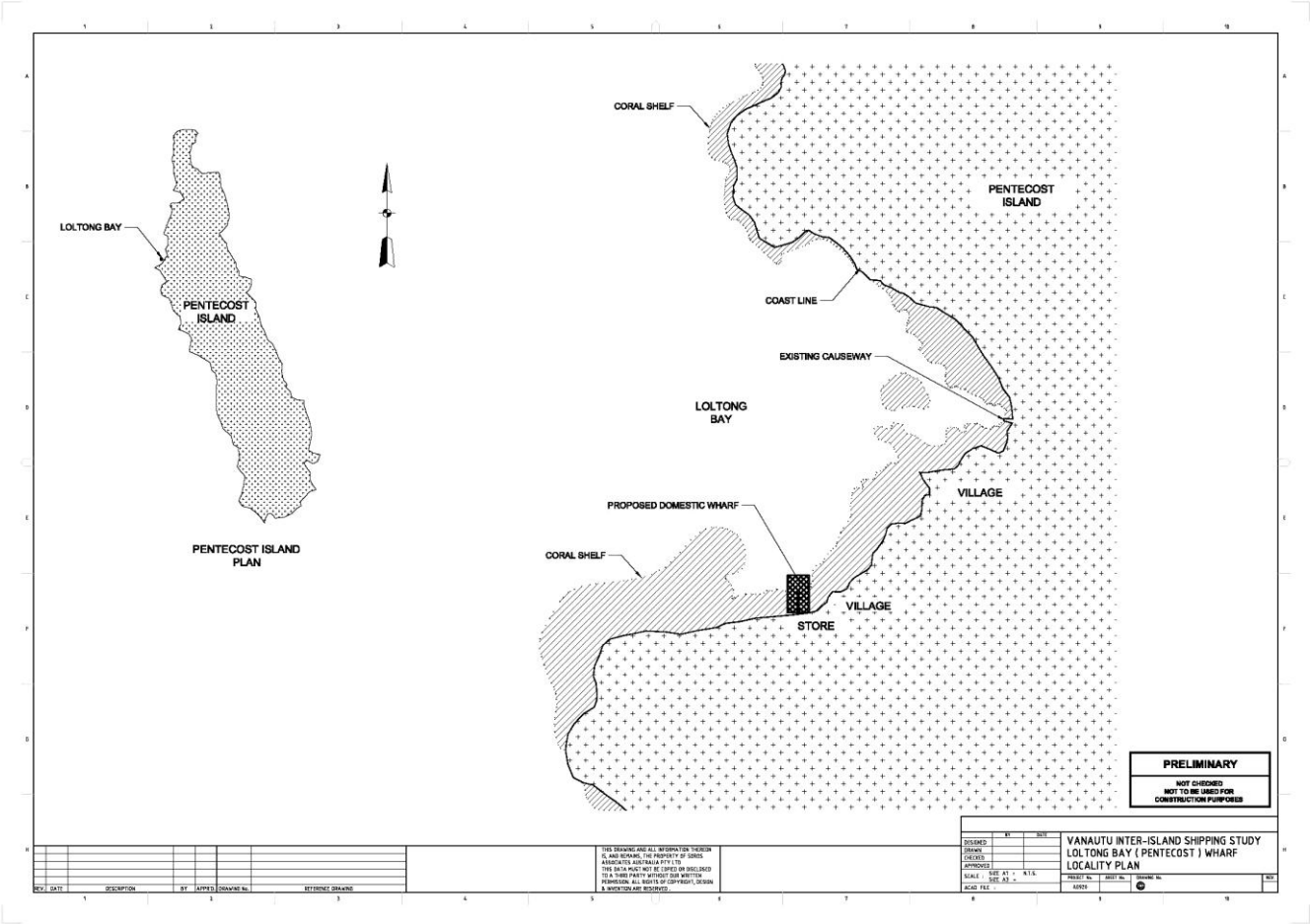
285. This section of the Project aims to provide a preliminary design for a representative structure in the outer islands in Vanuatu to improve the ability for inter-island vessels to call at remote destinations, thereby improving the movement of cargo and passengers to and from their villages. The number of facilities will be selected based on estimated costs and priorities set by an economic analysis of a list of potential locations.

286. The selected projects will upgrade, rehabilitate, or provide new facilities in the outer islands assessed to have high development potential. This process is discussed in Chapter 5, Economic Assessment.

287. It is expected that the short-listed projects will be designed and then implemented using internationally accepted engineering standards, by construction contractors skilled and adequately resourced to construct the infrastructure in compliance with these standards

288. It is recommended that the potential outer island subprojects, typically referred to as jetties, be constructed in general accordance with the standard design as proposed and described below. If possible, adoption of a standard design for all jetties in the outer islands will assist in minimizing the cost of and time needed for construction. This report provides basic engineering details of the development of the Loltong and the Outer Island jetty design. A full engineering report is attached at *Appendix 3.3 - Loltong Bay Engineering Design Report*.

Figure 3.6: **Loltong Bay (Pentecost) Wharf Location Plan**



3.5.1 Engineering Design Criteria

289. AS 4997, *Guidelines for the Design of Maritime Structures* and BS 6349 *Maritime Structures* both **recommend that the Design Life of permanent commercial structures of this type should be 50 years**, on the assumption that normal maintenance is undertaken on a regular basis.

290. One aim of adopting a long design life is to minimize the maintenance needed. While the objective is to deliver zero-maintenance projects, this may not be fully achievable.

291. As for Port Vila wharf the *Sarafenua* (conventional hulled vessel) and the *Dinh 1* (landing craft) have been adopted as the design vessels., with details shown in *Table 3.7* (a repeat of *Table 3.2*):

Table 3.7: **Design Vessels**

Vessel	LOA (m)	Beam (m)	Draft (m)	Deadweight (t)	Passenger Capacity
Sarafenua	40	~6	2.1	120	12
Dinh 1	43	~8	1.8	400	60

292. It may also be necessary to consider other individual vessels operating for design purposes during the detailed design phase, where a particular vessel is known to operate and which may have specific design requirements, or there are plans for the employment of particular types of vessels in the future.

3.5.2 Tides and Setting Out

293. Predicted tides at Loltong and each outer island site are difficult to determine from available information. While the marine charts provide estimates of the high and low tides at selected locations, these estimates are not necessarily accurate. For example, tide tables prepared by the Australian Government Bureau of Meteorology for Vanuatu for 2009 show differences of up to 0.3m compared to the tide range shown on the Port Vila marine chart.

294. Vertical setting out of jetty structures for construction is difficult, since accurate level datum definition, through the availability of benchmarks, is not be available. As noted for Port Vila, normal practice for maritime infrastructure design is to use the level of Lowest Astronomical Tide (LAT) as zero Chart Datum. However, with no information available on where LAT occurs at each site, this approach is impractical. Since Mean Higher High Water (MHHW) can be readily determined by simple observation, **it is recommended that all levels for vertical setting out be based on an agreed level of MHHW**.

295. In accordance with AS 4997, *Guidelines for the Design of Maritime Structures*, allowance should be made when considering levels for predicted sea level rise. For a design life of 50 years, this standard recommends an allowance of 0.2m.

3.5.3 Channel Depth, Width and Turning Space

296. These criteria are as for the Port Vila wharf and repeated here for the sake of good order. Minimum design channel depth at low tide should ideally be selected to include:

- the laden draft of the Design Vessel of 2.1 m;
- an allowance for vessel vertical movement from wave action of 0.4m; and
- a further allowance of 0.5 m for under-keel clearance (UKC) of 0.5m.

297. Channel depth at low tide should therefore ideally be at least 3.0m below Chart Datum.

298. Depth alongside the berth needs to make allowance for waves since each berth is not protected or sheltered from wave action. Hence, **depth at the berth should ideally be at least 3.0 m at low tide.**

299. The safe navigable width of all approach channels should be at least three times the vessel beam, or 24m, based on PIANC guidelines for navigation channel design. This will need to be increased to four times the vessel beam (32m) if significant currents run in the channel.

300. In circumstances where the vessel needs to turn at or near the berth, a turning space should be available, with adequate depth to operate, as noted above. A turning circle is preferred for safe operation, and **a circle of diameter at least twice the vessel length is recommended**. For the Design Vessel, this will be 86 m. If space for turning is restricted, then a smaller circle, of 1.5 times the vessel length would be an absolute minimum requirement.

3.5.4 Wind and Wave Conditions

301. As noted for Port Vila wind and wave conditions are characterized by two distinct seasons in Vanuatu. The prevailing winds are east to southeast trade winds. They are most common between May and October when they blow from these directions with a high degree of constancy. The typical wind speed is 30–40 kph. From November to April there are west to northwest winds. These are usually lighter than the trade winds and less persistent. Occasional cyclonic disturbances, particularly in the southern parts of the islands, also occur during this period.

302. The wave action created by the east and southeast trades will have the most important effect on jetty structures, particularly in ports with little natural protection.

303. For safe and comfortable mooring for vessels at a berth and stable conditions for loading and unloading passengers and cargo, the extreme wave conditions at the berth should desirably be no higher than 0.3m wave height, and must be no more than 0.5m. While the design vessel will find these wave conditions acceptable, smaller vessels may need calmer conditions. These smaller vessels would probably be able to remain safely berthed at the jetty in these wave conditions, but they may not be sufficiently stable to load/unload passengers and cargo safely.

304. Assessment of incident wave conditions and sea state is subjective and reliant on observation during extreme weather conditions. Both the north-westerly and the south-easterly weather patterns need to be taken into consideration when assessing whether a subproject site is adequately sheltered from larger waves.

305. Although protection from incident waves can be provided by constructing a breakwater or similar protective structure, this is not viable for the subprojects because of the substantial additional expense such a structure would cost.

3.5.5 Berthing and Mooring

306. Design standards for berthing and mooring at outer islands jetties are based on similar requirements for Port Vila and repeated here for good order. The design vessel is assumed to be able to berth alongside the standard jetty structure in a normal controlled fashion, under its own power and with little or no assistance from mooring lines to arrest its approach.

307. Based on AS 4997, *Guidelines for the Design of Maritime Structures*, a commercial vessel of 500 tonnes is expected to have a typical berth approach velocity of 0.20m/sec in a mildly exposed situation, or 0.25m/sec in a moderately exposed situation. For fender design, using the PIANC Guidelines (2002), **it is therefore recommended that an approach velocity of the design cargo vessel of 0.25m/sec will be adopted** for design of jetty fenders.

308. BS 6349 *Maritime Structures – Part 4: Design of Fendering and Mooring Systems*, **recommends that bollards with 100 kN capacity will be adequate** for mooring a vessel of 500 displacement tonnes under sheltered conditions. This includes provision of bow and stern line bollards located on the shore some distance from the jetty.

3.5.6 Design Loads

309. Design standards for loads and loading combinations for structural design of the wharf and approach structures use the same appropriate international standards noted for the Port Vila wharf – see Section 3.1.6

3.5.7 Assumptions

310. Engineering design for the Loltong jetty design and the standard jetty design has been developed by making a number of assumptions:

- in order to ensure that the design life criteria of 50 years is met, local labour and locally-sourced structural materials, except where specifically appropriate, will not be used for construction of these subprojects;
- protection from excessive sea state by providing a breakwater or other protective structure at an exposed location are not considered or included in any subproject, because of the high additional cost;
- dredging of channels and for navigable depth at berths are not included for these subprojects. Adequate depth, channel width and turning space must be available for navigation, berthing and manoeuvring within the natural channels and seabed profile in the vicinity of the site;
- the existing wharf infrastructure at Loltong or other potential subproject sites are all in very poor disrepair and no part of the existing structure(s) can be salvaged for inclusion in the new structure(s). The remains of the existing structure will have to be demolished to clear the site for new construction if in exactly the same place;

- new jetty infrastructure will be constructed at or directly adjacent to the existing wharf infrastructure;
- internationally accepted engineering standards of design and construction will be used for all infrastructure; and
- steel sheet piling will not be used to construct any part of the jetty design.

3.5.8 Standard Jetty Materials, Reinforcement, and Piles

311. All construction materials must be selected with the primary aim of providing long-term durability of the completed jetty structure, which as a consequence should require minimal or no maintenance over the life of the structure. The selection of materials is also highly dependent on availability and lead times for delivery, particularly of imported materials.

312. Most international standards, including AS 4997 and BS 6349, recommend concrete with a characteristic compressive strength of at least 40 MPa, and preferably 50 MPa, for marine structure concrete. In addition,

- minimum cementitious materials such as cement, fly ash, etc. should be 400 kg/m3 of concrete, for adequate concrete durability;
- aggregate size will normally be 20mm, although for confined spaces, 10mm aggregate may be preferred;
- sand must be clean, and in particular must be washed to remove any traces of salt, if the sand is sourced from close to the coast; and
- coral is not suitable for concrete aggregates in structural concrete.

313. In order to achieve the best possible quality in concrete structural components, advantage should be taken of precast concrete as much as possible. Precast concrete components can be manufactured to much higher standards and to more rigid quality controls than in-situ cast concrete. This will enhance the overall durability of the completed jetty structure. All precast concrete components should be manufactured in a dedicated precasting yard at a central location, to take advantage of consistent reinforcement and formwork assembly, and strict quality control of concrete mixing, placing and curing.

314. Even if all opportunities are taken to utilize precasting for much of the jetty structure, some in-situ cast concrete will still be needed in the construction of each jetty structure. **It is recommended that all materials needed for the mixing of in-situ cast concrete, including cement, coarse and fine aggregates, be sourced from a central location, e.g. Efate, to ensure consistent materials and concrete quality**.

315. The primary mechanism for deterioration of concrete maritime structures is corrosion of the reinforcement, leading to premature spalling of the concrete and hence loss of structural capacity. The widespread use of stainless steel reinforcement in maritime structures removes this corrosion mechanism of structural failure, and therefore **it is recommended that all reinforcement be stainless steel**. A further benefit of using stainless steel reinforcement is the permissibility of reducing the concrete cover to the reinforcement by at least 25mm.

316. While this incurs a significant cost penalty in comparison to carbon steel reinforcement, this is considered to be justified as it substantially extends the life of the structure without high demands for ongoing maintenance. Stainless steel reinforcement is available from Australia and New Zealand, with a cost premium above carbon steel reinforcement in the order of Vt$180 per kg. This equates to a total additional cost for stainless steel reinforcement of about Vt1,900,000 per jetty.

317. From a structural perspective the most efficient steel pile section for carrying both axial compression and bending loads is the circular tube section. As for Port Vila, the geotechnical conditions at each subproject site are expected to be coralline, with the possibility of some reasonably hard material to be encountered within the depth needed to drive piles. It is therefore recommended that preference be given to using Universal Bearing (H) piles in lieu of circular tubes, as H piles are more rigid and therefore better suited to hard driving through hard foundation materials.

318. OneSteel produces Universal Bearing Piles (UBP) in grade 300PLUS steel, which has a yield strength of at least 280 MPa and a tensile strength of at least 440 MPa. One disadvantage with UBPs

is that they are generally not held in stock and need to be ordered for the subprojects. The main benefit of UBP sections, other than their strength for driving through hard material, is their robust section. Unlike Universal Column (UC) sections also produced by OneSteel, the UBP sections have a web thickness which is the same as the thickness of the flanges. This provides superior durability against corrosion of the section since the rate of corrosion is evenly distributed across the entire section of the pile.

319. For the determination of losses due to corrosion of steel UBP piles, it is recommended that an annual corrosion rate of 0.15mm/year on each exposed face be adopted. If additional corrosion protection measures are used for these piles, then losses due to corrosion can be calculated either by using a lesser corrosion rate from the start date, or the nominated rate commencing from a delayed point in time after construction.

3.5.9 Investigations for Design

320. Before detailed design can commence, detailed information about the site is normally collected during a site investigation phase.

321. In order to confirm that adequate water depths and channel access and navigability are available, **a detailed hydrographic survey of the site and approach channels should be completed.** This survey will assist in:

- confirming the optimal location and alignment for the jetty;
- confirming the availability of adequate approach channels;
- providing useful detailed information on the tide range, where the investigation should be undertaken during a period of spring tides, if possible; and
- obtaining level information for the design of the approach causeway abutment.

322. **A detailed geotechnical investigation of Loltong and each outer island site is not recommended at this stage**. Instead, it would be prudent to build into the construction contract a requirement to drive one test pile at each site to establish the pile driving conditions to be encountered, thereby providing an opportunity to abort a site if unforeseen and adverse geotechnical conditions are discovered.

3.5.10 Site Preparation Demolition and Disposal Assumptions

323. As noted in the assumptions, the pre-existing wharf or jetty structure at Loltong or other subproject location should be demolished and disposed, if required for placement of the new facility. **Investigation of the site should include identification of a suitable offshore site for disposal of demolition debris.** The preferred method of debris disposal is considered to be to a designated and clearly defined offshore disposal site, which is characterised as:

- in at least 6m depth of water, at low tide;
- clear of main navigation channels, so no hazard to navigation is created;
- having a plain sandy seabed, with no reef structures in the immediate vicinity which could be damaged; and
- within reasonable distance of the subproject site.

324. Disposal of piles into a disposal site of this nature will create a suitable new habitat for benthic development, thereby enhancing, rather than degrading, the local environment. Disposal offshore is also expected to be less costly and cause less environmental impact than disposal to a land-based location.

3.5.11 Standard Jetty Layout

325. The proposed general layout of the Loltong Jetty design and the standard jetty design has been adapted from the layout used for other wharf/jetty structures planned recently for other South Western Pacific nations. This layout has been shown to provide adequate wharf jetty area for single vessel operations, both for cargo handling and passenger embarkation, within an economical

structural form. The general form of the jetty design will be a concrete deck and approach jetty supported on a grid of structural steel piles.

326. The height of the deck for the jetty design needs to be set to suit both the freeboard of all vessels operating at the jetty, cargo and passenger loading and unloading requirements and to take into account the tidal range at the sites, including considerations for sea level rise from global warming.

327. Vessel freeboard, or the height of the main deck above the waterline, varies both from vessel to vessel, and for each vessel, depending on its laden state. Typically, vessels in Vanuatu carry both cargo and passengers but smaller passenger ferries such as *Fresh Cargo* operate also. Vessels such as the *Sarafenua* have a higher freeboard than passenger ferries. In normal trim, the *Sarafenua* has a freeboard of about 1.2m, while the *Fresh Cargo* has a freeboard of about 0.8m. Since a cargo vessel can be worked loading and unloading cargo more readily regardless of the height of the wharf relative to the working deck level, wharf height should be designed to more precisely suit the deck level of passenger vessels.

328. Tidal range at the Loltong sites and other outer Island sites varies from location to location. This range, between MLLW and MHHW, can be as little as 0.7m to as much as 1.0m, according to information provided by the marine literature. Where the tidal range is low, wharf deck level should be set so that the level of the vessel's main deck coincides with the wharf deck at high tide. This sets the wharf deck level at about 1.2m above Mean Sea Level.

329. At locations where the tidal range is large, the wharf deck level should be set somewhat higher, so that, at high tide, the vessel does not sit too high against the berth. For a tidal range of 1.0m, a good compromise is for the deck height to be set at 1.3m above Mean Sea Level, which would provide a minimum wharf deck height of 0.8m at high tide and 1.8m above low tide. Once a clear understanding of the tidal ranges measured at each site have been obtained, more certainty about wharf deck height can be gained.

330. If the Loltong Jetty design is to be adopted for other outer island sites, the deck level must be set depending on the tide situation at each individual project site.

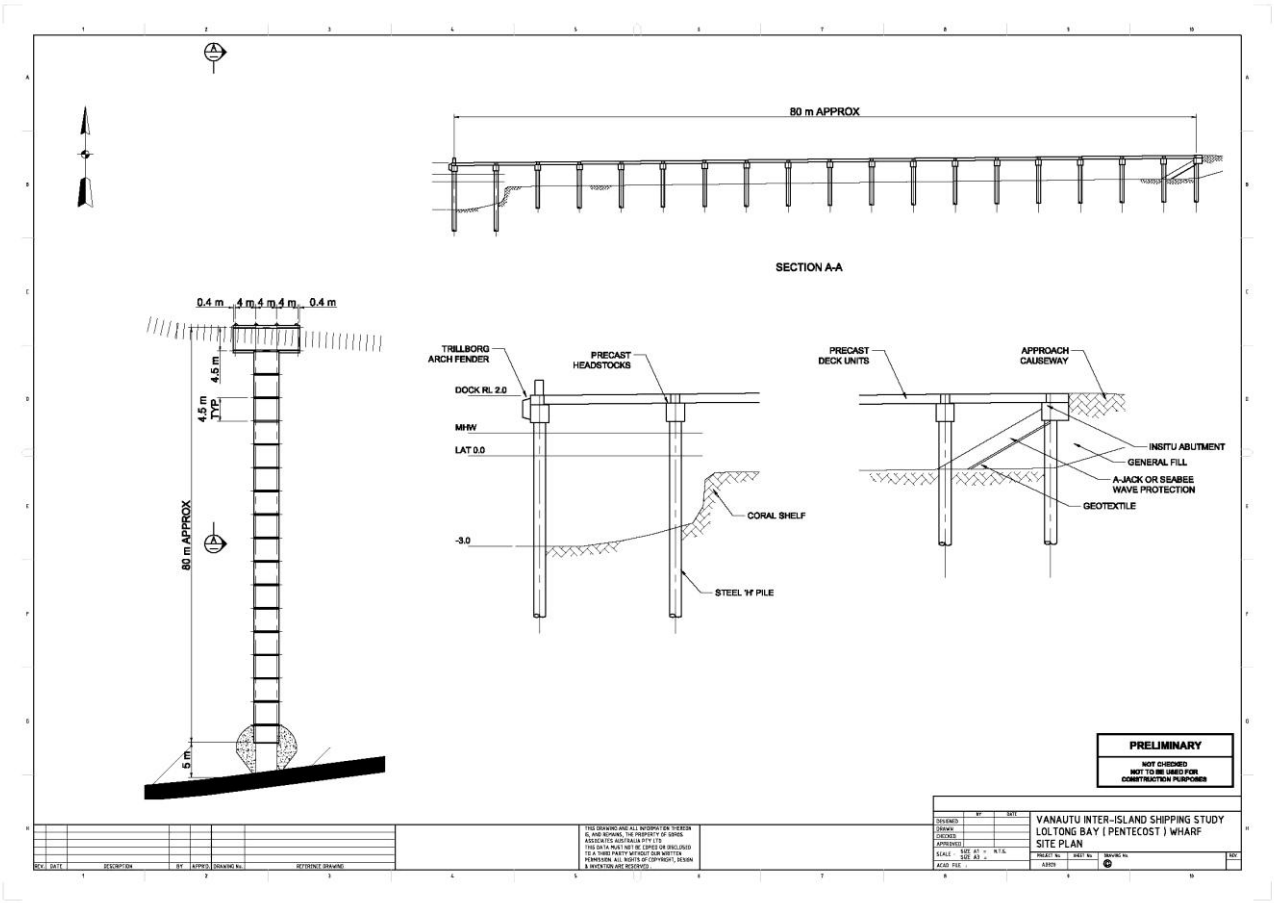
331. A further factor to be considered when setting the height of the deck is prediction of sea level rise. Based on advice from the Intergovernmental Panel on Climate Change, AS 4997 recommends making an allowance of 0.2m for structures with a design life of 50 years. **It would therefore be prudent to increase the final agreed height of the deck at Loltong by this amount to 2.0m above low tide.**

3.5.12 Standard Jetty Dimensions

332. The main area of the jetty should be a T-head at the outer end of the approach jetty. The T-head should be 12m in length and 5m wide. This suits a pile grid spacing of 4m by 4.5m. The approach jetty should be 4m wide and comprise one or more 4.5m length modules. The number of modules will need to be selected on the basis of the distance needed to locate the front face of the T-head in adequate water depth. For the purpose of determining the estimated cost of the Standard Jetty Design, four modules of 4.5m length have been assumed, which places the front face of the wharf about 23m out from the causeway abutment.

333. A plan layout of the 80m Loltong Jetty design, at Latano, is shown in below.

Figure 3.8: **Loltong Bay (Pentecost) Wharf Site Plan**



3.5.13 Pile Spacing and Capacity

334. A pile grid spacing of 4m by 4.5m should allow the proposed 310UBP sections to provide sufficient capacity to carry the design loads, although a detailed structural analysis has not been undertaken for this structural arrangement to confirm this. This pile grid spacing is also workable for permitting access of a typical floating pile-driving barge and plant, taking into account the necessity for some of the piles to be driven at a rake to carry horizontal loads imposed on the structure. Raking piles have notionally been set at a rake of one horizontal to six vertical. This should be confirmed by structural analysis during detailed design.

335. To obtain sufficient pile load capacity to carry the vertical and horizontal design loads, it is expected that all piles will be driven into the seabed for a minimum penetration of 6m. Detailed design will ascertain the driving capacity needed to satisfy the structural requirements for the jetty design, based on assumed geotechnical conditions.

3.5.14 Causeway Abutment

336. Where the approach jetty structure joins the foreshore, a causeway abutment needs to be provided. In typical designs, this is constructed using a steel sheet pile vertical wall, backfilled to create the start of the causeway. This arrangement is not considered to be ideal, since a small quantity of sheet piling material needs to be procured, which creates cost inefficiencies. While this vertical sheet pile wall would be effective in providing protection to the causeway from erosion due to wave action, a different arrangement is proposed for this standard jetty design.

337. Erosion of causeways through constant wave action has been an ongoing problem with wharf and jetty structures in the past, and soundly engineered measures are needed to ensure the long-term stability and resistance to erosion of these causeways. This can be achieved by providing a small causeway, which has its front edge at a relatively high level on the foreshore. This will then

avoid most of the erosion forces from wave action causing damage to the causeway fill. By extending the approach jetty further onto the foreshore, the whole arrangement provides a stable combination which should not deteriorate over time. Erosion of the front face of the causeway abutment should be suitably protected in any case, using A-Jacks or Seabee coastal protection devices, to absorb any remnant wave energy. Flat slopes will also assist in absorbing the wave energy and hence reducing the onset of erosion of the fill.

338. The general arrangement of the causeway abutment is shown on the drawings in *Appendix 3.3, Loltong Bay Engineering Design Report*.

3.5.15 Protection of Steel Piles

339. As noted above, a corrosion allowance should be applied to determine the reduced pile section dimensions at the end of the design life.

340. To delay the onset of corrosion of these piles, other measures can be used. Common corrosion protective measures include:

- coating piles with a protective coating;
- wrapping piles in a protective wrapping system;
- enclosing the piles with a concrete sleeve; and
- cathodic protection.

341. Of these options, enclosing the pile with a concrete sleeve is considered to be the most suitable in delaying the onset of corrosion in a cost-effective way. Concrete sleeves are applied to piles after they have been driven, and the sleeve should extend from the soffit of the deck beams to the seabed. Permanent formwork for these sleeves, using UPVC pipe, is a preferred method, since the UPVC acts as an additional barrier to the ingress of oxygen to the steel pile. For a 310UBP section, a sleeve at least 500 mm in diameter will be adequate for protecting the piles. The concrete sleeve can be cast either by placing concrete through a tremie tube or by using a grouted aggregate technique.

342. Concrete should have a characteristic compressive strength of at least 40 MPa, and light mesh reinforcement should be used in the sleeves to strengthen the concrete, which will be subjected to some bending forces and shrinkage during the life of the structure. References include

AS 4997	Guidelines for the design of maritime structures
BS 6349	Maritime structures
PIANC	Design of fender systems, 2002
AS1170.4-1193	Minimum Design Loads on Structures Part 4 – Earthquake Loads

3.6 Outer Island Jetty Design Specifications

343. The superstructure for the Loltong Jetty design comprises a set of beams fixed to the steel piles. These beams then support a set of concrete deck planks to form the finished wharf deck. An in-situ cast concrete topping to these deck slabs is not considered necessary.

3.6.1 Precast Deck Beams and Slabs

344. The beams will all be precast reinforced concrete, with the top of the beam finished at deck slab soffit level. Exposed reinforcement in the top face of the beam is interlaced with the deck slab reinforcement, so that when additional concrete is cast in-situ to the top of the beam, the whole structure becomes fully composite and rigid.

345. All beams, including the abutment beam, have a rectangular cross-section, and are sized to carry both the temporary load of the simply supported deck slabs during construction and the service loads once the superstructure is complete. The precast beams are provided with holes at each pile location so that a rigid connection between beam and pile can be made using a small quantity of in-

situ cast concrete infill. The holes in the beams will need to be large enough to accommodate pile driving tolerances.

346. Once the beams have all been placed on the piles and fixed, the precast concrete deck slabs are placed and fixed to the beams with further in-situ cast concrete. The deck slabs have been sized at 240mm thick and 1200mm in width. These deck slabs are of reinforced concrete. They should not contain any prestressing, as this would compromise the durability of the deck slabs.

347. These deck slabs need to be designed to carry the temporary construction loads in a simply-supported mode, as well as the service loads in their fixed mode in the completed composite structure. The top face of these deck slabs should have a broomed finish. Slabs should have fittings provided to facilitate lifting them into position, to avoid damaging them from lifting chains, hooks or slings.

3.6.2 Pile Material

348. Pile material is expected to be procured from Australia, and will be supplied in 12m lengths. When they are driven into the seabed with a penetration of 6m, this will leave sufficient length to reach the soffit of the front deck beam in the expected water depth needed for the design vessels. For piles supporting the abutment beam, two or three shorter piles can be obtained from one 12m length. To facilitate accurate driving, it would be advisable to cut a point onto the driving end of each pile.

3.6.3 Jetty Furniture: Fenders and Bollards

349. In past projects, fenders have been discarded truck tyres suspended by chains along the front face of the structure. These tyres have been combined with horizontal timber support beams fixed to the piles below the level of the deck. Tyres used as fenders for vessels of the type used for inter-island shipping are not considered to be the ideal method of protection for both the vessels and the jetty structure. The capacity for tyres to provide both adequate berthing energy absorption combined with minimal reaction force is very limited. It is therefore recommended that the Loltong Jetty design and the standard jetty design incorporates properly designed proprietary marine elastomeric fenders fitted to the front face of the jetty structure, so that vessels are well protected during berthing for all states of the tides.

350. An appropriate fender would be an arch fender manufactured by Trelleborg, Bridgestone, Marubeni or similar supplier, fitted horizontally and vertically to the front face. This will require the front beam to be configured to include a suitable fender mounting panel. Each arch fender would be about 1m in length, and mounted on the centreline of each pile grid. A further three fenders would need to be mounted horizontally between the vertical fenders, so that the jetty face is fully fendered. Hence, a total of seven fenders would be provided on each jetty structure.

351. These fenders should be designed in accordance with the PIANC Guidelines, using the vessel berth velocities noted above. All fenders should be fixed to the jetty with stainless steel fixing bolts for maximum durability.

352. As previously noted above, mooring bollards of 100 kN capacity are needed for securing vessels at the jetty. Four bollards will be mounted on the four corners of the T-head, and two additional bollards will be provided on concrete blocks on the shore about 40m off the centreline of the jetty. These shore bollards will secure the main bow and stern lines, while the bollards on the T-head will be used for breast and spring lines.

353. For durability and strength, the bollards should be proprietary items and manufactured from ductile cast iron. Holding down bolts should be galvanised and set through the deck for easy replacement in the event of bolt failure.

3.7 Outer Island Jetty Construction

3.7.1 Demolition and Disposal

354. As noted in the assumptions, remains of old structures should be demolished and removed before construction of the new jetty is started, if in the same site. This includes removal of any remaining deck beams, removal of coral rubble fill, and complete extraction of all old piles from the

seabed. This should provide a clean site for new construction. The contractor should also be required to conduct a thorough debris survey of the seabed, using a diver, to ensure that no obstructions such as chains, tyres, concrete debris or other materials remain on the seabed, which might hinder construction.

355. The need and requirements for a clearly defined offshore disposal site have been outlined above. This disposal site will be used to receive all materials removed during demolition. Control of demolition materials disposal in this way provides a sound procedure to minimise damage to the local environment. It may be necessary for large pieces of old structure, such as long lengths of piling, to be cut into short lengths to facilitate disposal. It would be advisable to limit the size of disposed pieces to, say, 3m in length.

3.7.2 Pile Driving

356. Since no geotechnical investigation of the subproject sites is anticipated, it will be prudent to start construction by driving a test pile. This test pile can be located in a permanent pile location, and needs to be driven to the specified penetration and pile ultimate driving capacity as determined by detailed design. It may be necessary to test this pile using a static load bearing test to confirm the capacity of the pile.

357. The driving of this test pile will provide the necessary driving information needed to ascertain the driving requirements for the remaining piles for the structure. In the event that the test pile cannot be driven to the design penetration or capacity, action can be taken to re-evaluate measures to achieve capacity.

3.7.3 Concrete Beams, Slabs, and Infill

358. All concrete beams and slabs will be precast reinforced concrete. A central precast yard will need to be set up, with facilities for storing concrete materials in accordance with the appropriate standards, facilities for manufacturing concrete and for curing and storing all concrete components ready for shipment to each construction site. Facilities for making test samples are also needed.

359. Some emphasis needs to be placed on establishing a conforming concrete mix design in accordance with the requirements of the specification and international standards, and subsequently to proper curing of all completed concrete components, to ensure that adequate concrete strength and density is achieved.

360. A regular testing program for all materials and concrete test samples must be established and the requirements of the relevant standards adhered to during construction. Conformance with all testing and quality control requirements will be a major contributor to ensuring that the best possible durable concrete is delivered to the project.

361. Concrete is needed for placing in-situ, for pile protection sleeves, for fixing the precast beams to the piles and for completing the top of the beams to complete the joining of the beams with the deck slabs. Most of this in-situ concrete is structural in nature, and therefore must be mixed and placed to the highest quality and standards achievable.

362. It is recommended that materials needed for in-situ concrete such as cement, aggregates and admixtures should be sourced in Port Vila, or another central location, to enable quality control to be maintained for these materials, which can then be packaged and dispatched to each construction site for mixing. Controlled batching of this concrete, to an approved mix design demonstrating conforming strength properties, will need to be implemented at each site and adequate test sampling conducted to ensure satisfactory concrete quality. Proper curing of the in-situ concrete once placed, is also essential to achieve adequate concrete quality.

363. For the main body of fill for the causeway, coral rubble is a suitable material, although some effort should be given to compacting the material to minimise settlement and deformation of the causeway.

3.7.4 Causeway Abutment

364. Construction of the causeway abutment can commence once the piles and abutment beam have been completed, and before the approach jetty deck slabs are placed. This will allow ready

access to the front sloping face of the abutment, which needs to be protected using the necessary erosion prevention measures specified. Geotextile will be used beneath the armour layers to prevent suction of fine material out of the fill, which would otherwise result in collapse of the causeway.

3.7.5 Cost Estimates

365. Detailed cost estimates have been prepared for the Loltong Jetty design and for a standard jetty subproject design for the outer islands. As for Port Vila wharf these estimates are in three parts. The first part covers contract preliminaries and is based on four subproject sites selected. Preliminaries includes costs of:

- insurances;
- performance bank guarantee;
- advance payment bank guarantee;
- site office and services for the Engineer;
- contractor's site facilities & maintenance thereof;
- mobilization to first site;
- demobilization and movement between sites;
- final demobilization;
- site supervision / management costs;
- provision of clearance / debris surveys for four wharf sites (3m x 3m grid); and
- other fixed charges items required by tenders not included above.

366. The second part of the cost estimate covers the capital works for the Loltong jetty design and for single standard subproject jetty. The third part of the cost estimate provides an estimate of the maintenance costs, spread over the life of the structure, and presented in life cycle cost format. A discount rate of 6% has been used for the calculation of this component of the estimate.

367. Typical rates for both the first and second parts of the estimate have been obtained primarily from the tenders received for the previous contracts. These tenders were submitted in February 2006, and the rates have been escalated to October 2009 dollars, using inflation figures of 7.6% for 2006 and 7.0% for both 2007, 2008, and 2009 estimated.

368. As already noted above, for the purpose of determining the estimated cost of the standard jetty design, four modules of the approach jetty structure, of 4.5m length each, have been assumed, resulting in a jetty approach length of 20 metres. Including the jetty head, the structure will be 24.5 metres from the berth face to the approach abutment.

369. The total estimated capital cost for the projects therefore comprises the estimate for the preliminaries, plus the estimate for one jetty multiplied by the number of jetty sites proposed to be included in the Project.

370. Details of the preparation of the cost estimate are contained in a separate commentary Volume 3.4, Loltong Bay Capital Cost Estimate Commentary. The detailed cost estimates for Loltong Jetty and three standard jetties along with a detailed bill of quantities has been prepared for both types of jetties, and rates applied to arrive at the estimates are shown in *Table 3.9* below:

A summary of estimated costs for Loltong and three representative sites and jetty lengths is shown in *Table 3.10*.

Table 3.9: **Detailed Estimate - Loltong and Other Outer Island Jetty Sites**

Infrastructure Capital Cost estimates

Outer Island Sites

Item Description		Vatu	Vatu	Total Vatu	USD	Foreign USD	Local USD
Preliminaries (note: partly varies with no of sites)							
Supervision, Site Facilities Etc				118,689,571			
Tug/Barge Mobilisation/Demobilization Costs				177,686,500			
Subtotal				296,376,071	2,963,761	2,501,566	462,194
		Loltong	Other sites				
Works	No of sites: 4						
Site Preparation/Setting Out		2,160,381	4,361,143	6,521,524			
Piling		37,767,482	44,335,739	82,103,221			
Concrete		33,452,313	39,365,866	72,818,178			
Formwork		9,669,145	11,136,542	20,805,687			
Earthworks		4,881,073	15,109,997	19,991,070			
Deck Furniture		2,774,929	8,324,786	11,099,714			
Landing Ramp (PC Item - 40,000,000 each)		40,000,000	120,000,000	160,000,000			
Cargo Shed (PC Item 12,000,000 Each)		12,000,000	36,000,000	48,000,000			
Subtotal		142,705,322	278,634,072	421,339,394	4,213,394	2,474,547	1,738,847
Engineering (Design,Project Management)	25%	35,676,330	69,658,518	105,334,848	1,053,348	-	-
Construction Contingency	10%	14,270,532	27,863,407	42,133,939	421,339	-	-
Total		**192,652,184**	**376,155,998**	**568,808,182**	**5,688,082**	**2,474,547**	**1,738,847**
Overall total				**865,184,253**	**8,651,843**	**4,976,113.53**	**2,201,041**

Table 3.10: **Summary - Outer Island Sites - Jetty Costs and Lengths**

Description	*Assumed Jetty Length*	*Vatu*	*USD*
Total establishment (4 sites)	-	296,376,071	2,973,761
Loltong site works	80m	192,652,184	1,926,522
Outer islands site works - 1 jetty	24.5m	125,385,333	1,253,853
Outer islands site works - 2 jetties	24.5m	250,770,666	2,507,707
Outer islands site works - 3 jetties	24.5m	376,155,998	3,761,560
Total cost (Loltong + 3 jetties including est. to 4 sites)		**865,184,253**	**8,651,843**

3.8 Outer Island Jetty Maintenance and Repairs

371. As for the Port Vila wharf there will be requirements for ongoing maintenance and repair. The observations and suggestions set out in Section 3.3 Port Vila Maintenance and Repairs direct apply to the outer island jetties.

372. Some mechanical damage to the jetty deck concrete and the concrete sleeves protecting the steel piles is expected over the life of each wharf structure. The calculation of maintenance costs includes an allowance for expending 5% of the initial concrete cost, and 10% of the initial pile concrete sleeve cost, every ten years on repairs to these areas of each jetty. These estimates of damage are based on all reinforcement in the jetty concrete being stainless steel. If carbon steel reinforcement is used, substantially greater expenditure will be needed to routinely repair jetty concrete, and a 50 year life is not likely to be achieved before the jetty structure becomes unserviceable.

373. Overall, these maintenance items amount to an average annual expenditure of Vt822,000 (0.91% of capital expenditure) for Loltong and Vt491,000 (1.20%) for a standard jetty. This has been rounded to 1% for the economic analyses. Costs for maintenance are included as a separate item in

the cost estimate in the engineering report in *Appendix 3.4, Loltong Bay Capital Cost Estimate Commentary*.

3.9 Outer Island Jetty Environmental Assessment

374. An environmental assessment of the proposed Loltong jetty was undertaken to meet potential donor funding requirements. This is a shortened version of the entire Initial Environmental Examination (IEE) which is attached to the report as *Appendix 3.7, Initial Environmental Examination (IEE): Rehabilitation of Loltong Inter-Island Jetty on Pentecost Island*. The full IEE is contained at *Appendix 3.12, IEE: Rehabilitation of Jetties in the Outer Islands of Vanuatu at Lolowai, Port Sandwich and Waisisi* and the EMMP for Loltong can be found at *Appendix 3.8, Ifira Wharf (Star Wharf) Engineering Investigation Report*. For the outer islands in general the SIEE, EMMP and IEE may be found at *Appendices 3.9, Dinh Wharf (BP Wharf) Engineering Investigation Report, 3.10 Simonsen Wharf Engineering Investigation Report* and *3.13 IEE: Construction of the Inter-Island Wharf at Port Vila, Vanuatu* respectively.

375. While Loltong Bay is a sheltered marine ecosystem it does not have any major sea grass beds, mangrove forests or coral ecosystems. At the jetty site, the coral platform extends 80-90m to the edge of the reef where it drops to deep water. The marine ecosystem, as represented by the surrounding coral reef, is not particularly diverse nor productive since apart from live corals (11%) it mainly consists of a coral rock platform with sand and debris. No major schools of fish were observed and the main fish included some Damselfish and Angelfish. Bottlenose Dolphins, Hawkesbill turtles and Dugong are sited in the bay. These species are protected, but are also common in Vanuatu.

376. The possible direct beneficiaries for the jetty include the coastal and hinterland communities behind Loltong, which consists of 33 villages with a combined population of about 5,630 persons. The majority of the people depend on subsistence agriculture to meet their family's needs and also provide small amounts of cash for meeting personal needs and education costs. The main crops grown in Loltong are copra, yams, cocoa, taro and kava, the latter of which is increasing in production.

377. Health and education facilities are poorly developed in the outer islands with critically affected people requiring transport to provincial centres or Port Vila or Luganville. Access to basic services is poor in rural areas with only 5% and 17% of households having access to electricity and piped water respectively.

378. A matrix of expected impacts, mitigating measures and the monitoring program is provided in *Appendix 3.8 - Environmental Management and Monitoring Plan: Loltong*.

379. Two possible jetty sites are available at Loltong. One at Latano proper that was destroyed in 1987 and the other which is situated at the Loltong beach where the inter-island ships currently load and unload their goods and passengers. While the old jetty site at the Catholic Mission at Latano is favoured as the site by the local development association, the other site in the bay should be further evaluated since the length of the jetty to reach deep water in this bay may only be about 30m, which will reduce pile driving by about 80% and significantly reduce the environmental impact from this activity.

380. During the design and pre-construction, the following will need to be addressed: (i) the assessment of the alternative location within Loltong Bay; (ii) considering climate change in the design; (iii) provision within the design to cope with longshore currents which will require the jetty to be built on piles to allow movement of sediment past the jetty; (iv) provision of a compensatory water supply for a few households should access to a coastal spring be restricted by the jetty; (v) the inclusion of the EMMP conditions in the bid and contract documents; and (vi) the provision of environmental criteria in selection of the contractor.

381. Construction is estimated to take between three and six months. The main impact will be noise and vibration resulting from driving the steel piles. Activities that are required to be addressed during construction include the following: (i) the requirement to prepare a Safety and Environmental Management Program (SEMP) outlining how the contractor will address the requirements of the EMMP, (ii) the induction of the contractor to the site and the verification of the SEMP will be a pre-requisite before the contractor can commence work; (iii) the storage and handling of construction materials, fuel and lubricants - refuelling within the marine environment is to be covered by a refuelling and fuel handling procedure that will be included as a part of the SEMP, which will also contain a fuel spill contingency plan; (iv) noise and vibration from pile driving will be a major concern and could last

for two to three weeks - the closest shore based community is 100m distant and is unlikely to be affected - marine life will move away from the site during driving and will not affect significant marine life such as turtles (as these do not nest in the area) - there are no sea grass beds in the vicinity of the bay and the activity will not affect dugong, who use the bay to rest in rather than for feeding - dolphins will be able to avoid the source of noise and vibration for the relatively short period that it will occur; (v) the contractor will be required to implement a workplace health and safety program; and (vi) all waste is to be collected and properly disposed.

382. The jetty will operate on an as required basis that depends on the ship's sailing schedule. Operational impacts indicate that; (i) safe vehicle loading limits will need to be imposed on vehicles entering the jetty since the jetty can only accommodate light vehicles; (ii) a jetty maintenance program under the direction of the DPH will be need to protect the investment in the jetty; and (iii) a jetty manager will collect and dispose of waste from the ships.

383. Public consultation was arranged at a series of meetings with communities during the site visit and was attended by about 40 people. There is wide support for the building of a jetty in Loltong since this will assist the broader economic development goals of the communities who cannot see these being fulfilled by the current system of having to load and unload cargo directly to and from the vessel. Women were very supportive of the project, since it will make it easier for old and infirm people and women with young children to embark and disembark.

384. Based on a review of documents, discussions and field assessment it is concluded that the subproject will have few adverse impacts, all of which can be mitigated. The subproject has strong community support and will make a direct contribution to improving the socio-economic and living conditions of those communities living in the area. The construction of the jetty will require the acquisition of 0.2 ha of land, but at Latano this has already been acquired by the local development committee under their development plan. The main impact will arise from noise and vibration occurring during 2-3 weeks of construction but this will have little consequence on significant marine life. The jetty will be designed on a pile substructure, which will prevent longshore sediment accumulating on the structure. All other impacts have been identified and analyzed and the remaining impacts have been assessed as being inconsequential or can be mitigated. The direct costs of the EMMP are US$50,153, which includes the cost for supplementing a spring water supply, monitoring and provision of consultancy services. The subproject is compliant with the ADB's environmental safeguard policies and the IEE will be the final environmental assessment for the project. By adopting the environmental mitigation and monitoring measures outlined in the EMMP the project will be able to address the environmental concerns.

4. Social Impact

This chapter presents the results of consultation with stakeholders and communities concerning the need for infrastructure and shipping services.

In general, consultations revealed that inter-island shipping services to and from the outer island areas are currently perceived as being extremely infrequent, inconsistent, and unreliable. The main concerns are:

- **the low level of service has a negative impact on agricultural production in these remote outer-island communities, wherein more frequent and especially more reliable shipping is perceived as a key to stimulating increased production of cash crops, thereby contributing directly to economic development in these areas;**
- **infrequent and unreliable shipping services impact negatively on rural people's access to basic services such as education and health;**
- **the lack of reliable transport in remote islands is cited as a major cause of poor school attendance;**
- **lightering is perceived as being not only inefficient and time consuming, but also dangerous and routinely causes damage to cargo.**

In addition outer island communities considered that jetties and a storehouse would support local economic development and that there was a general dissatisfaction with the practice of lightering cargo and passengers. Consultations suggested that users of shipping services were willing to pay more for improved services, particularly if they were more reliable.

Consultations with regular users of ship transport services suggested a number of improvements to Port Vila wharf facilities that would benefit both passengers and those who use shipping to transport cargo. These improvements focused on passenger terminal facilities and the handling of cargo. [Section 4.4]

It is recommended that:

1. **the reliability, consistency, and frequency shipping services be improved; [sections 2.3, & 4.3]**
2. **aside from factors contributing to an economic justification, outer island maritime infrastructure be considered for implementation for reasons of improvements to the quality of life, improved safety and the fostering of more social interaction and integration; [s3.3 & 3.4]**
3. **should the proposed infrastructure developments prove feasible, they be constructed using as much local labour and materials as possible in order to provide local communities with a sense of ownership over the works; [s5.1]**

4. **outer island infrastructure include a warehouse; [s5.2]**

5. **where roads between a proposed jetty site and the hinterland are very poor or non-existent, it be a prerequisite of jetty construction that there is a commitment by the government to construct a road or improve the existing roads [s5.3] and**

6. **urban wharves be located in a sheltered area. [s3.2]**

4.1 Overview

385. The population of Vanuatu is currently estimated to be around 240,000 and is expected to reach about 270,000 by 2015. At around 2.4% per annum, the population growth rate is one of the highest in the Pacific. Vanuatu has a very young population, with about 50% under 20 years of age. This has serious implications in terms of the growing demand for education, employment, and other basic services.

386. Over three-quarters of the population live in the rural areas, widely dispersed across more than 80 islands and islets. This poses major challenges for the delivery of basic rural services and infrastructure, resulting in high costs and inefficiencies. Agriculture is still the primary means of livelihood for about 80% of the population, both for subsistence and for production of cash crops such as kava, copra, taro, and timber. Access to markets and services, including health and education, often involves travel around or between islands by boat or ship, and the majority of the rural population is heavily dependent on inter-island shipping services.

387. Health indicators and life expectancy have improved considerably in recent years, mainly due to improvements in health services such as prenatal care and increased immunization coverage. However, the rural population still experiences difficulties accessing basic health services, which are also impeded by shortages of medical supplies and trained personnel. Most rural aid posts and health centres are only able to provide basic services, with more serious problems referred to the nearest provincial hospital. For many people this can involve travelling long distances by ship or by air at high personal cost.

388. The delivery of basic education services to a small, widely dispersed population also poses major challenges, particularly to those living in the more remote outer islands. Basic education is not compulsory in Vanuatu, and enrollment and attendance are among the lowest in the Pacific. The main reasons for non-attendance include difficulties of access due to long distances to the nearest school, the poor quality of teaching, and the high cost of school fees.

389. A study of poverty and hardship in Vanuatu conducted in 2003 concluded that “hardship… is widely perceived to exist, primarily through lack of, or limited access to, basic services such as education, health, good roads and safe drinking water”.[23] In rural areas, strong family and community ties continue to provide effective social safety nets, and despite the lack of access to cash, absolute poverty is rare. At the same time, rural families are under increasing pressure to generate cash to meet expenses such as school fees, medical services and other basic needs.

390. Over 90% of people in the lowest three expenditure deciles live in the rural areas. Torba Province in the far north and Tafea in the southern most part of the country have significantly higher proportions of their populations in the lowest three expenditure deciles than other provinces. For these populations, and for many living in remote outer islands, the costs associated with transporting produce to regional markets to generate cash income, including freight and passenger fares, market fees and living costs in the regional centres, are often beyond their means.

[23] Asian Development Bank, *Priorities of the People, Hardship in Vanuatu*, Manila, 2003

4.2 Inter-island shipping services

4.2.1 Existing Situation

391. Ni-Vanuatu are a highly mobile nation, travelling regularly from island to island and between the outer islands and the urban centres for a range of economic, social, educational, recreational, and other reasons. Shipping still provides the main means of transport for the majority of people. In terms of economic activity, rural people are heavily dependent on inter-island shipping services both for the provision of goods and services, including essential goods like food, fuel and medicinal supplies, and to transport their produce to regional markets.

392. Inter-island shipping services to and from more remote provinces, such as Torba and Tafea, and larger regional centres are currently less than adequate. Consultations with people from remote outer islands confirm that ship calls are extremely infrequent and unreliable. Communities living in these areas cannot therefore rely on shipping services, whether for passenger travel or for the transport of cargo to/from regional centres. This has had a negative impact on agricultural production in these remote provinces as there are strong financial and logistical constraints to marketing produce outside the immediate local vicinity.

393. Infrequent shipping can be a major cause of poor attendance by children from remote areas who have to travel long distances to school. Shipping is also a very important means of delivering school equipment and stationery, and infrequent and unreliable services often result in schools lacking essential materials. Poorer families in remote rural areas who need to send their children to secondary school on other islands often experience great difficulty raising the necessary cash to cover school fees. The cost of transporting children to school, including ship fares, places an additional burden on these families and directly contributes to non-enrollment, or enrollment of only one or two children in the family. The lack of access to regional markets due to poor inter-island shipping services effectively reduces people's ability to generate cash, thereby contributing to their inability to meet the cost of school fees.

394. Infrequent, irregular and unreliable shipping directly impacts on health services in remote outer islands and compounds the problems of poor service quality. Local aid posts and dispensaries often run out of basic medicines and other essential supplies as a result of irregular, unreliable shipping services. Infrequent and unreliable shipping is also a major problem for people needing to travel to other islands for medical treatment.

395. Consultations with a wide range of people who use shipping services regularly, including those living at selected potential wharf sites, revealed that many have major concerns about safety standards and conditions on board. Overcrowding on vessels and the lack of appropriate facilities for passengers were commonly reported. People also complained about the lack of adequate capacity on board ships to carry cargo. Many arrive at ports of call on the outer islands full of inbound cargo, and cannot take more cargo on board.

4.2.2 Perceived benefits of improved shipping services

396. All informants from remote outer islands expressed the view that there were major benefits to be gained from more frequent shipping services. The main benefit was seen as being improved opportunities to transport cargo to regional markets to earn much-needed cash. Some people expressed the view that more frequent, reliable shipping services would transform their local economies by enabling them to market cash crops like kava, copra and timber. This is expected to stimulate increased local production of higher value crops and products, in turn generating greater demand for shipping services.

397. Rural communities are also increasingly dependent on imported processed foods such as rice, sugar and flour, and on other consumables such as fuel, mainly for boats. Shortages of these basic commodities are common when local shops and stores on the islands run out of stock. Improved shipping services to remote areas would clearly address this problem by enabling regular restocking of common foodstuffs, fuel and other commodities.

398. Informants also envisaged a range of other social, cultural, educational, recreational and other benefits flowing from increased mobility, particularly if shipping services are reliable and affordable. Increased mobility is expected to have a significant positive impact on the general health

and wellbeing of people living in remote areas by enabling them to travel regularly for the purpose of attending school or college, seeking medical treatment, banking, attending church, sporting and recreational functions, participating in festivals and celebrations, and visiting family and friends.

399. Importantly, improved shipping services are expected to improve school attendance and levels of educational attainment. First, improved sea transport means increased access to markets to sell produce, thereby increasing rural people's cash income and enabling them to better afford school fees. Second, improved shipping services would increase students' access to secondary schools and would enable the regular delivery of supplies of school materials, equipment and examination papers. Improved transport services would also encourage teachers to work in more remote areas.

400. Informants also expected that access to health services in remote outer islands would improve as a result of improved shipping services. As well, health services at village and district level are also expected to improve. Regular, frequent shipping services would ensure health centres remain adequately stocked with medical supplies and equipment. Qualified medical staff would also be more willing to work in remote areas if more frequent, regular and reliable transport services were available.

4.2.3 Affordability of improved shipping services

401. Consultations with people from remote outer islands revealed that the cost of freight was not a major concern for many, and most people would be willing to pay more for freight if shipping services were more regular and reliable. Reliability was seen as especially critical.

402. If freight charges were to be increased substantially under the proposed inter-island shipping support scheme, however, poorer people, particularly very small producers, would be likely to experience difficulty paying these higher costs. Higher freight charges could act as a major disincentive to small producers with small volumes of cargo. These people are generally charged higher freight rates and are not in a position to negotiate lower rates.

403. To reduce the costs of transportation to the small local producer, two options are worth considering: first, to establish a system whereby the producer sells directly to a local trader or wholesaler who then arranges transportation of aggregated produce and is therefore well placed to negotiate lower freight charges for larger volumes of cargo. This is widely practiced in many parts of Vanuatu, including in Banks and Torres where copra remains one of the main exports. The other option for the small producer is to sell directly to traders on ships.

404. On the question of passenger fares, most people expressed the view that these were already high enough. The current fares already act as a disincentive to poorer people to travel more frequently. On the other hand, when travel is a priority, as it is for important family ceremonies (e.g. weddings, funerals), then people accept that they have no choice but to pay the high costs associated with doing so, but they will limit their use of transport services to what they regard as essential trips.

405. With the establishment of more regular, frequent and reliable shipping services, and improved coordination of services with preparation of cargo for ship calls, it is expected that local production will increase over time and income levels will rise accordingly. This in turn will increase people's ability to pay higher freight rates and passenger fares.

4.3 Rural wharves

4.3.1 Existing situation

406. Existing transport infrastructure in many parts of the country, especially in more remote rural areas, is either extremely limited or in poor condition. Rural wharves and jetties constitute an important link in the inter-island transport system, enabling more efficient, safer, faster and easier loading and unloading of passengers and cargo onto and off ships. In the absence of wharves, the loading and unloading of cargo and passengers is either done by lightering, usually using small motorised canoes ("banana boats"), or directly from landing craft lowering their ramps as close as possible to the shore. Depending on the tide and local conditions, landing craft are often unable to get very close to the shore, with the result that cargo must be carried manually through the sea to and from the shore and passengers are obliged to wade to shore.

407. Some ships currently make numerous calls along a coastline, simply slowing down to enable loading and unloading of cargo and passengers into small craft. Lightering is time consuming and inefficient if large volumes of cargo are involved. Lifting extremely heavy cargo into and out of ships from small craft can be difficult and dangerous, risking injury and losses or damage to cargo. The risks of losses or damage to cargo and injury to passengers are even greater in rough seas or bad weather, or after dark. For sick, elderly or disabled people, and for pregnant women and young children, boarding and disembarking from ships via small boats is particularly difficult and treacherous, especially in rough seas or from rocky coastlines or over coral reefs.

4.3.2 Local demand for rural wharves/jetties

408. Consultations conducted with local communities and stakeholders at the potential subproject sites at Loltong (north Pentecost), Lamen Bay (north Epi), Lolowai (Ambae), Craig Cove (west Ambrym), and Port Sandwich and South West Bay (Malekula) revealed that the demand for wharves and jetties is high and the facilities are expected to yield significant benefits and opportunities. The reasons cited were related to increased efficiency, lower land transport costs, speed and convenience of loading and unloading cargo on the one hand, and to improved safety and comfort of passengers boarding and disembarking from ships on the other.

409. While landing craft may, in ideal conditions, come close in to shore and enable the loading and unloading of cargo and passengers without the use of small boats, in many instances this is not possible either due to tides, rough seas, reefs or rocky shores. In such cases, the landing craft are obliged to put down their ramps far from the shore and the normal practice of carrying cargo and passengers in small boats to and from the ship is carried out. Alternatively, if the landing craft is relatively close to shore, people are obliged to wade through the water, carrying the cargo on their shoulders. If they are required to climb over reefs or rocks, in rough seas or in the dark, the process can be quite treacherous. This is particularly risky and dangerous for the elderly, sick, disabled or pregnant women. Informants also often talked about cargo getting wet or damaged in the process of being loaded or unloaded via small boats.

410. In Loltong, north Pentecost, consultations with community members revealed that regular ship calls to the bay is attracting large numbers of people who engage in marketing and small retail outlets in the area. The area is developing economically and the reconstruction of a jetty in the bay is clearly seen as supporting this development.

411. In Lolowai, east Ambae, the development of a wharf is also regarded as a high priority to support local economic development. This view is strongly supported by the Penama Provincial Council and the business community around the Saratamata–Lolowai area.

4.3.3 Perceived benefits of rural wharves

412. Economic development is perceived as the most important positive outcome of having a jetty in the outer island communities. The presence of a jetty is widely regarded as supporting and stimulating local economic activity, mainly by providing improved connectivity with regional markets. Increased flows of people into and out of the areas around the wharves are expected to stimulate the development of small local markets and retail outlets, providing opportunities for local residents to generate additional income. Women in particular are expected to benefit from the opportunity to sell food and other produce.

413. Where maritime infrastructure facilities are linked to roads, the benefits are likely to reach a far larger number of people as many living further inland will be able to bring their produce to the jetty site for shipment. This improved connectivity, together with regular and reliable shipping services, is expected to stimulate increased economic activity and growth in production in the area, particularly of cash crops such as copra, kava, cocoa and coffee.

414. Through local community consultations it was revealed that local people have a strong preference for jetties over the current practices of lightering or using landing craft to load/unload cargo and passengers because of the perceived improvements in efficiency, convenience, safety and comfort associated with a jetty.

415. Additional benefits identified during consultations relate to improvements in the safety, speed, ease, comfort and convenience of boarding and disembarking from ships, and the increased efficiency of loading and unloading cargo, resulting in reduced risk of personal injury and loss or

damage to cargo. Women, particularly pregnant women and those carrying young children, the sick and elderly, disabled and those carrying heavy loads will also benefit significantly from the presence of a jetty.

416. There are clear signs of high economic activity in the areas adjacent to the four priority subproject sites and the potential for substantial economic development. This is based on local informants' reports of the amount of activity already conducted in the area and the volumes of produce already being exported from the sites.

417. In Loltong, where local association members are actively engaged in initiatives to stimulate the local economy, a jetty is seen as an essential element of improving the inter-island transport system. As the local economy grows and larger volumes of produce are generated for export, a jetty is seen as an important means of supporting the efficiency and effectiveness of loading and unloading operations.

418. Local informants in Lolowai also regard a jetty as essential to the improvement of cargo operations. In particular they cited a reduction in damage to goods as a key reason for wanting a jetty. They also saw a jetty as attracting trade and business to the area.

419. The reconstruction of the jetty at Port Sandwich is seen by local people as significantly reducing the risk of injury to those using the existing jetty, particularly to people loading and unloading heavy cargo in bad weather or after nightfall. The existing jetty is too high and redesign of the jetty would greatly facilitate loading and unloading of cargo at low tide.

420. At Waisisi, on the east coast of Tanna, the potential benefits of a jetty are mainly seen as supporting the development of the local economy by improving people's access to better markets. For example, a local jetty would significantly reduce overland transport costs to producers, who currently have to transport their produce to Lenakel for shipment to other islands. A jetty would also support the development of tourism in the area by facilitating the offloading of tourists from cruise ships and yachts visiting the bay.

4.3.4 Negative impacts

421. The main potential negative impact of a jetty, resulting from increased shipping and greater numbers of people and traffic into the sites, is seen as the risk of increased pollution in the bays and surrounding areas. This was identified in Loltong, Lolowai and Waisisi. Some informants expressed slight concern about increased noise and disturbance to local village life, but this appeared to be less of a concern where housing was located some distance from the jetty sites. In any event, local informants were unanimous in their agreement that the risk of negative impacts was far outweighed by the potential positive benefits of a jetty.

4.3.5 Land issues

422. In none of the subproject sites were any land disputes identified and the team were assured by local landowners that they strongly supported the use of the sites for the development of a jetty and ancillary infrastructure. In Loltong, the land has already been acquired by the government and so no further land acquisition will be required, unless the final site is relocated. In the other three sites, the land needs to be formally registered by the landowners in order for the government to acquire the sites and compensate the landowners appropriately. It is the understanding of the Social and Poverty Specialist that the land at these three locations has not yet been registered. Further investigations will be needed to confirm this. If registration has not yet occurred, then this process should begin as soon as the project is approved and the exact sites have been confirmed.

4.3.6 Resettlement issues

423. No housing was observed at or close to the proposed jetty sites in three of the subproject locations: Loltong, Lolowai and Port Sandwich. It is therefore unlikely that there will be a requirement for relocation or resettlement of local residents at these sites. Local community members at these three sites confirmed that no houses were located in or very close to the proposed wharf sites.

424. The only site where there may be a need for relocation of a very small number of houses is at Waisisi, but this can only be confirmed once the exact location of the jetty site has been decided. Waisisi is also the only known site where some disturbance to an area of cultural significance may be

necessary. An area of the reef close to the shore is located close to the site identified for the jetty development. This reef is protected by the community, and it is taboo to fish there during certain times of year. The community assured the team that, were the jetty to be constructed at this site, they would perform certain ceremonies (tamava) at the site that would then enable the development to go ahead.

425. Should any resettlement or relocation of any buildings, gardens or sites of cultural significance be required at Waisisi or at any of the other subproject sites, the local community members at all sites emphasized that this process should be done internally by the community members themselves, without external intervention. They did not envisage any problems or disputes arising from this. Moreover they expressed strong willingness and support for this to happen, should it be required, based on their enthusiasm for a local jetty.

4.4 Port Vila wharf

4.4.1 Existing situation

426. Over the past 50 years Port Vila has become the main focus of finance and commerce, manufacturing and processing, transportation and marketing. The town's population has grown very rapidly over the last 20 years at around 4% per annum, from just under 30,000 in 1999 to over 40,000 ten years later. Most of this growth is the result of in-migration from the rural areas, as people move to the town in search of employment, education and access to better services and the attractions of urban life. The strategic importance of Port Vila is highlighted by the fact that it is the country's most important harbour and the centre of the country's trade. The development of the town therefore directly impacts on the prospects for the economic development of the country as a whole.

427. Given the fact that, from the end of 2010, there will be an acute shortage of berths for domestic ships, there is clearly an urgent need for a new domestic wharf facility to be developed. While the recent sale of one of the main domestic wharves, BP (Dinh) Wharf, is widely known, there seems to be little public recognition of critical nature of the situation in terms of the lack of alternative wharf facilities for domestic shipping in Port Vila harbour.

4.4.2 Selection of new site

428. The selection of the site for the proposed new domestic wharf was essentially an iterative process involving assessment of the suitability of a number of options in terms of the key technical and operational requirements of the wharf. Late in August 2009 the team submitted its recommendation to the government that the site that most closely met the requirements for a new domestic wharf was at South Paray, adjacent to the Star Wharf complex. On 4th September 2009 the Council of Ministers endorsed the recommendation that the "most likely" site for a new domestic wharf in Port Vila is at Star Wharf, although the precise location was not identified.

4.4.3 Public consultation process

429. A public consultation workshop took place about three weeks later at which the findings and recommendations of the initial environmental examination (IEE) of the proposed South Paray wharf site were presented. The workshop was attended by approximately 30-40 representatives from government, Shefa Provincial Council, non government organizations and the private sector who were invited to express their views and concerns. The majority of those expressing concerns about the environmental impacts of the proposed wharf focused on its location and the likelihood of increased pollution of Paray Bay resulting from the higher concentration of shipping in Paray Bay and ships discharging waste directly into the bay. These fears were reinforced by the lack of "flushing out" of the waters of Paray Bay, given the existing tides and flows.

430. It was acknowledged that the risk of increased pollution points to the need for effective management of the wharf and regulation of shipping operations, but based on experience to date, doubt was expressed about whether adequate control could be exercised to ensure such pollution would be minimized. Others expressed concerns about the potential negative impact on tourism and possible safety issues arising from increased shipping in the channel between Iririki and the mainland.

431. The strongest criticism came from senior representatives of Ifira, the powerful tribal group acknowledged as the traditional landowners of the area around Port Vila. These representatives

expressed dissatisfaction with the current proposed site and demanded that further consideration be given to alternative sites outside of Port Vila.

4.4.4 Demand for wharf facilities

432. Consultations with regular users of ship transport services suggested a number of improvements to wharf facilities which would benefit both passengers and those who use shipping to transport cargo. These facilities included:

- Proper passenger and cargo terminal facilities to ensure both are safe and secure while awaiting loading/boarding;
- A “shop front” for each of the shipping companies/operators at the wharf site, where information about schedules would be available and tickets and freight could be paid for;
- Secure storage space for outgoing cargo;
- Better handling of cargo, including segregation of different types of cargo;
- Separation of fuel and dangerous chemicals from other forms of cargo;
- A separate area or location for loading and unloading of livestock, e.g. pigs, goats, cattle, chickens;
- Separate loading of cargo and passengers, e.g. cargo loaded first, followed by boarding of passengers, to avoid accidents;
- Proper waste management and maintenance of the wharf;
- A passenger waiting room with adequate seating areas, sheltered from the weather;
- Proper toilet facilities and drinking water supply;
- Adequate lighting;
- Adequate space dedicated to containers;
- Parking area;
- Public phone.

4.5 Recommended Strategies

4.5.1 Community consultation and involvement

433. Sustainability of benefits from rural infrastructure improvements depends in large part on the effective engagement of local communities and ensuring their needs and preferences are properly taken into account in the design and construction of the infrastructure, as well as working out with them the most appropriate way to manage and maintain the facility. The design and precise location of proposed wharves and jetties will require further investigation and validation at project start-up. This should be done in close consultation with affected communities, provincial councils and the local PWD divisions, not only because of the issue of land ownership and payment of compensation but also because of local knowledge about tides, water depth, weather and local ecology.

434. Local communities should be involved, as far as is practical, in the construction of jetties, wharves and sheds, for example as casual labourers. Wherever possible, construction contractors should give priority to engaging local labour to provide community members with the opportunity to earn cash and to generate a sense of ownership and pride in ‘their’ facility. Local communities should also be encouraged to develop plans to manage, operate and maintain the infrastructure. This will generate a sense of local ownership and responsibility for the infrastructure and will contribute significantly to sustainability of benefits.

4.5.2 Complementary infrastructure

435. Preliminary consultations have established that complementary or supporting infrastructure, mainly in the form of storage sheds, are regarded as a high priority by local beneficiaries, and will be important to ensure optimal benefits are gained from the wharf development. Further consultations will be important to establish the precise location of the sheds, their design and construction. Management and maintenance of the storage sheds should form part of the local community planning process during project inception.

4.5.3 Road connectivity

436. The full benefits of rural jetties will not be felt in many locations unless there is improved road connectivity to enable producers to transport their produce to the wharves. Where roads between the proposed jetty site and the hinterland are very poor or non-existent, it should be a prerequisite of jetty construction that there is a commitment by the government to construct a road or improve the existing roads. The project should facilitate formal representations by local communities to provincial governments to improve road access. Complementary and harmonization with other donor-funded road improvement projects should be actively sought. However, as with the four identified priority sites, all except for Loltong, are already adequately connected to the main road networks since these locations are already being used to one degree or another for the consolidation of cargo and people for shipping.

4.5.4 Reducing the risk of conflict

437. The construction contract for the rural jetties should include a clause imposing conditions on the behaviour of construction teams towards local people to ensure proper respect is shown towards the community, and to the community's tambu sites, burial grounds and other areas of cultural significance. Local communities have the right to demand that construction teams generally behave in a respectful way towards them; likewise, the contractor should agree to penalize any employee who demonstrates unacceptable behaviour, such as the excessive consumption of alcohol or harassment of women and girls.

4.5.5 Local organizations to catalyse rural development

438. The construction of the rural jetties and complementary infrastructure offers a valuable opportunity to engage with local communities in planning further development of their villages and surrounding areas. During the early stages of project implementation, the project should investigate options to support local initiatives to develop the local community such as through the formation of local community associations. Initiatives involving the establishment of 'wholesale' facilities, including aggregating and transporting smallholders' produce to wharf sites, should be actively encouraged, as this will help stimulate local production and reduce the direct costs (in time and money) to small producers.

4.5.6 Managing health risks

439. As discussed above, local communities adjacent to the new rural wharf sites will be exposed to greater risks of STDs and HIV/AIDS, as well as increased exposure to alcohol, marijuana and other potentially harmful drugs. HIV/AIDS education, awareness and prevention programs should be integrated into the project through linkages with domestic and externally funded projects, such as those implemented by NGOs and through local aid posts and health centres.

4.5.7 Gender sensitivity

440. It will be important to target women as stakeholders and potential beneficiaries in both the inter-island shipping scheme and the construction of rural wharves. Women are highly motivated to generate income for the family, particularly to contribute to the costs of their children's education and to improve the overall well being of their families.

441. The period of rural jetty construction could represent risks to local communities, and particularly to women and girls, if the behaviour of construction teams is not managed properly.

Agreements should be drawn up in advance of commencement of construction work with local chiefs and community leaders on the appropriate behaviour of construction teams during their stay in the local area. The project should facilitate this process and also ensure that construction contracts incorporate a clause to abide by local communities' wishes in terms of maintaining standards of appropriate behaviour.

5. Economic Assessment

This chapter assesses the factors constraining and contributing to Vanuatu's economic growth and outlines the economic rationale for intervention in the domestic shipping sector. It analyses the projected economic returns for the support and infrastructure recommendations and concludes that investment in these proposed interventions will bring positive returns from supporting and facilitating inter-island transport and trade, and thus increasing economic development.

There are three main issues surrounding domestic sea transport and trade:

- **A key barrier to economic growth in Vanuatu is the lack of efficient and reliable transport services for moving goods and people about the archipelago. This has caused people to produce only what is needed for short term local consumption with little thought to creating surplus for exchange, savings and growth.**
- **Shipping services are hindered by poor support infrastructure, lack of compliance with safety requirements and an under resourced Ministry of Infrastructure and Public Utilities. Neither the few remaining infrastructure facilities nor many of the ships in the aging domestic fleet receive proper maintenance. All need to be addressed if economic development is to occur and be sustained.**
- **Over the last 30 years there has been numerous domestic shipping studies and recommendations, but little investment, reform, or improvement. There is a mounting risk that mistrust between ship operators and users of shipping services towards donors and central government that already exists will strengthen if action is not taken directly.**

The recommendations build on and reinforce earlier recommendations made in numerous previous studies [see section 5.9.3]. It is recommended that:

1. **Star Wharf be demolished to avoid imminent structural failure and a new wharf be constructed for Port Vila to avoid the potential loss of up to 1% of GDP, conservatively estimated to be in the order of Vt519 million per year, which would result from the existing structure failing to keep up with current traffic projections; [s5.8.1]**
2. **A new domestic wharf be built for Port Vila as soon as possible; [s5.8.1]**
3. **The GoV invest in the following four outer island sites where each of these infrastructure improvements yield a positive rate of return on investment:**
    - **Lolowai, Ambae, (existing site, structure destroyed);**
    - **Loltong, Pentecost, (existing site, structure destroyed);**
    - **Port Sandwich, Malekula, (existing site, structure needs rehabilitation); and**

- **Waisisi, Tanna, (new greenfield site). [s 5.8.2]**

4. **A more detailed analysis of individual engineering designs and associated costs is conducted for these four proposed sites before proceeding with implementation - given resource and time constraints on this design project, the analysis used a standard jetty design for all sites and highly conservative cost estimates; [s5.8]**

5. **The GoV initiate urgent discussions with JICA regarding maintenance funding and possible design amendment to the Litz Litz and Lenakal wharves, including a management system to assess the probability of failure due to weather constraints [s 5.9.1]**

6. **Simonson Wharf is scheduled for major rehabilitation in 2014 to avoid decreased berthing capacity and lower cargo handling productivity; [s5.9.2], and**

7. **increased cattle raising in remote communities should be explored if agricultural extension services improve in concert with suitable inter-island craft and services to transport cattle to an abattoir. [s5.2.3]**

The capital expenditure (capex), economic internal rate of return (EIRR) and the net present value (NPV) for each of the recommended infrastructure investments are:

Sub project	*Island*	*Capex Vt millions*	*EIRR*	*NPV Vt'000s*
Port Vila domestic wharf	Efata	812.4	19.0%	745.75
Waisisi Jetty	Tanna	181.78	15.3%	92.34
Lolawai Jetty	Ambae	181.78	12.5%	47.66
Port Sandwich Jetty	Malakula	181.78	12.2%	39.62
Loltong Jetty	Pentecost	181.78	11.7%	28.55

442. Sea transport, either in the form of international or inter-island shipping, is the backbone of transport in Vanuatu. Goods are imported principally to the two central consolidation ports of Port Villa and Luganville and what is not consumed in these urban centres is then transhipped to the rural local communities on outer islands via domestic inter-island shipping service providers. Similarly, goods predominately in the form agricultural commodities produced by rural communities on the outer islands is shipped to Port Vila and Luganville for consumption in the local domestic urban markets or forwarded on for export. The system of maritime infrastructure nodes and shipping services links thus forms a significant component of the national transport network upon which the economy of the Vanuatu archipelago depends for facilitating trade and commerce, and indeed is quite analogous to that of an interstate highway or rail system for economies of large land based countries.

443. As evident from the number of studies, project preparation proposals, and the few projects actually implemented, considerable attention has been given over the last 30 years to the importance of improving the efficiency of inter-island shipping to reduce internal transport costs. These projects have included in their scope:

- capital expenditures on maritime infrastructure to consolidate freight and reduce shipping costs;

- institutional reforms to promote better governance of the sector;
- changes to the legal and regulatory framework to invite greater private sector participation, investment, and transparency; and
- subsidized shipping support programs to increase the frequency of shipping services to remote sparsely populated areas.

To date, however, very few of the recommendations produced by these numerous studies have been either acted upon or implemented.

444. As for the two maritime infrastructure capital works projects that have been implemented, success has been mixed. The two large JICA funded wharves at Litz and Litz and Lenakel built in 1988 are routinely used and generate benefits, although the Lenakel facility was significantly damaged by a cyclone in 1994 and required major rehabilitation. Even today, questions remain about its usability and expected design life given its highly exposed location and associated cyclone risk. Of the smaller six ADB funded outer island jetties and landing stages built in 1989 at various locations, little beneficial economic impact has been accrued since many were ill sited or poorly constructed and have since been damaged by cyclones or simply not used due to poor design, insufficient water depth, or other hazards to ships.

445. The majority of maritime infrastructure facilities wharves listed in the 1989 NTDP maritime asset inventory, most of which were built prior to independence, are no longer useable due to a lack of maintenance, end of their design life, damage from cyclones, or a combination of all these reasons.

446. Therefore, based on these previous experiences, fundamental issues must be addressed with any proposal for new maritime infrastructure including: location, design, maintenance, and ancillary user support. Given small populations and poor internal land transport, the location of a facility must be carefully analyzed with respect to its catchment or hinterland and thus its associated forecasted freight volumes and usage for investment justification purposes. Additionally, the location must be relatively sheltered to minimize the risk of cyclone damage and unexpected termination of the design life. Furthermore, trends in the fleet composition between bow ramped vessels and conventional hulled vessels needs to be considered. Indeed, in order to maximize potential benefits, the location and design of facilities should be such as to induce the usage of such facilities by as many vessels as possible, whether these be the fewer bow ramped vessels or the more numerous conventional vessels. It should be noted that the trend in fleet composition towards moving from conventional to bow ramped vessels was forecast for Vanuatu in the 1993 ADB Inter-island Shipping Study. However, even after 16 years, the change in fleet composition is not occurring rapidly, and would be even slower if not for the recent influence of the external donor funding.[24] Lastly, not all locations are suitable for bow ramped vessel operations, and conventional shipping will most probably continue to play a significant role in the composition of the domestic fleet and outer island shipping. It has been reported that current bow ramped operators in Vanuatu only are able to reach the beach due to natural topography, depth, and weather conditions some 25% to 50% of their ship calls. Additionally, bow ramped operators have cited the need for rural maritime infrastructure to assist with operations similar to the wants of conventional ship operators.[25]

447. One of the repeated concerns elicited from most outer island shipping services users on the current mode of shipment and exchange is the lack of properly managed storage facilities. Thus, shipping services users must time their arrival at the point of ship calls based on their expectation of when the ships will arrive. Sometimes ships are early and the call is missed; sometimes ships are late and considerable time is spent waiting. Sometimes a ship's timing may change en route, and it is not uncommon for an expected ship call to not occur. Additionally, to coordinate one's timing with that of a ship call may pose issues for ongoing other activities or the availability of inland transport.

[24] In 2008 the AusAID Enterprise Challenge Fund awarded a grant to a domestic shipping services provider in Vanuatu. This grant was in the order AUD750,000, or approximately 50% or more of the purchase price of an additional vessel as well as the establishment of some supporting infrastructure in the remote areas to be serviced by the new bow ramp vessel (*viz* Torba). The implications of this introduction to the other Ni-Vanuatu ship operators in the market is likely adverse, and leads one to ponder whether this decision may not have given adequate consideration to such equity and market issues, or even as to how it may be perceived by the Ni-Vanuatu given the source of funding and nationality of the recipient.

[25] Indeed, in some locations the bow ramped vessels cannot make the beach at all or only under limited conditions, and thus would benefit from some form of landing facility similar to how conventional ships would benefit from a wharf.

448. The availability of secure storage would enable users to deliver their produce or pick up their imports when convenient, particularly if the facility formed a burgeoning commercial centre. Such a process would inevitably introduce the concept of a middleman, trader, or wholesaler where none exist; or, where they do engage in commerce, increase competition amongst them. In order for a commercial centre to function properly, an acceptable system of payment would have to be established, in lieu of the present system whereby producers are paid for their goods by ship captains, or otherwise must pay the passenger fare and carry their wares themselves to the central markets of Port Vila or Luganville. Implementation and management of such a storage facility will be highly key to the proposed project maritime infrastructure, shipping support scheme, and shipping coordinator scheme, and indeed in the overall long term success the Project. However, it should only be considered where there is a provincial government proposal for a commercial centre or otherwise a stated willingness of a private sector entrepreneur or local government unit to manage the facility on some form of commercial basis.

5.1 Macro and Socio-Economic Development Context for Project Rationale

5.1.1 Country Background: Geographic, Demographic, and Political

449. The Republic of Vanuatu is a Y-shaped Melanesian archipelago of approximately 80 mostly volcanic islands located in the southwest Pacific extending 1,176 km in a north-south direction between the equator and the tropic of Capricorn. In terms of geologic age, most of the islands are quite young having been formed from volcanic eruptions or seabed upthrusts. Consequently, most islands exhibit steep mountainous terrain with narrow coastal plains.

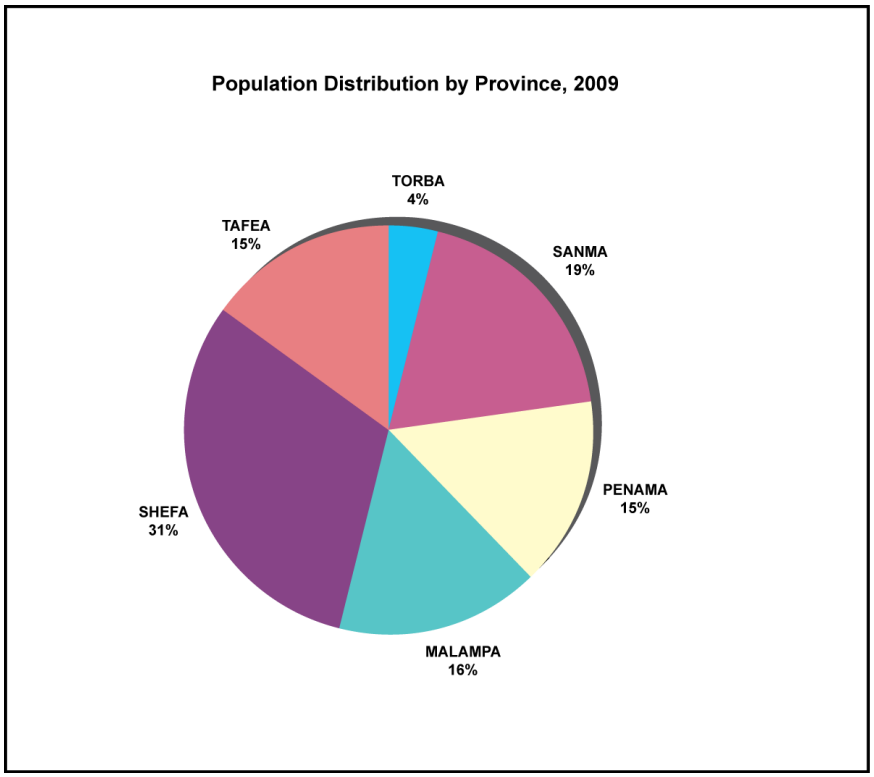
450. Vanuatu has a wet tropical climate with an average annual rainfall of 2,588 mm, an average annual temperature of 24C, and humidity between 75 and 80 percent. Vanuatu is highly vulnerable to natural disasters such as earthquakes and is the most cyclone prone country in the region experiencing an average of 2.6 cyclones per year. Historically, the effect of these cyclones, particularly those that can be deemed rare extreme events, has been to shorten the planned design life of the nation's infrastructure, particularly maritime infrastructure, or to require major repairs to mitigate the damage inflicted.

451. As enumerated in the 1999 census, the resident population was estimated at 186,678 with 79% defined as rural, living in the small provincial settlements with livelihoods largely based on subsistence farming. The two urban centres, the municipalities of Port Vila and Luganville, accounted for the remaining 21% of the population. The 2009 census is now being enumerated, however, based on previous historic growth rates and inter-census year sampling undertaken by studies such as the 2006 Household Income and Expenditure Survey (HIES), estimates have been projected as illustrated in *Table 5.1*.

Table 5.1: **Basic Population Statistics, 1979-2009**

	Population (1000s)				Average Change, %pa			
	1979	1989	1999	2009	1979-1989	1989-1999	1999-2009	1979-2009
Urban	15.8	25.9	40.1	57.0	5.06	4.48	3.58	4.37
Rural	95.5	116.6	146.6	183.9	2.02	2.32	2.30	2.21
Total	111.3	142.4	186.7	241.0	2.50	2.74	2.59	2.61
Urban (in %)	14.19	18.16	21.48	23.66				

Figure 5.2: **Population Distribution by Province, 2009**



452. Population growth is high for the nation as a whole with an estimated 2.6% per annum over the analysed 30 year period. There is an urban-rural divide in terms of the relative economic opportunities available, which is spurring a migration of persons and families born in rural areas to the urban areas for education and employment, principally Port Vila. This rural migration to urban areas is thus affecting the long term growth rates whereby urban areas are growing at average 4.3% per annum, while the rural areas are only growing at an average of 2.2% per annum, yet it is in the rural provinces where the majority of the population currently live, at least for now. This trend is also likely widening the disparities between provinces, whereby Shefa province that contains the municipality of Port Vila, continues to grow at the expense of other provinces. Based on the HIES, despite significant differences in estimated growth rates, there is little difference between the average household size being approximately 4.7 persons per household overall.

453. Until independence in 1980, the country was known as the New Hebrides, being a condominium ruled jointly by France and the United Kingdom. The colonial economy was characterized by dualism, with a government and commercial urban sector dominated by foreigners and a largely subsistence based rural agricultural sector comprised of the Melanesian majority of the population. Although independence has brought about changes in the political system, the economy remains characterized along this urban cash economy versus rural subsistence economy divide. In recent years economic growth in the urban areas has been driven by tourism and its spill-over effects to other sectors such as real estate and services creating both employment and entrepreneurial opportunities. Meanwhile, the rural sector remains predominately focused on subsistence agriculture constrained by a lack of adequately maintained infrastructure, basic services, and livelihood opportunities.

5.1.2 Macroeconomic Conditions and Indicators

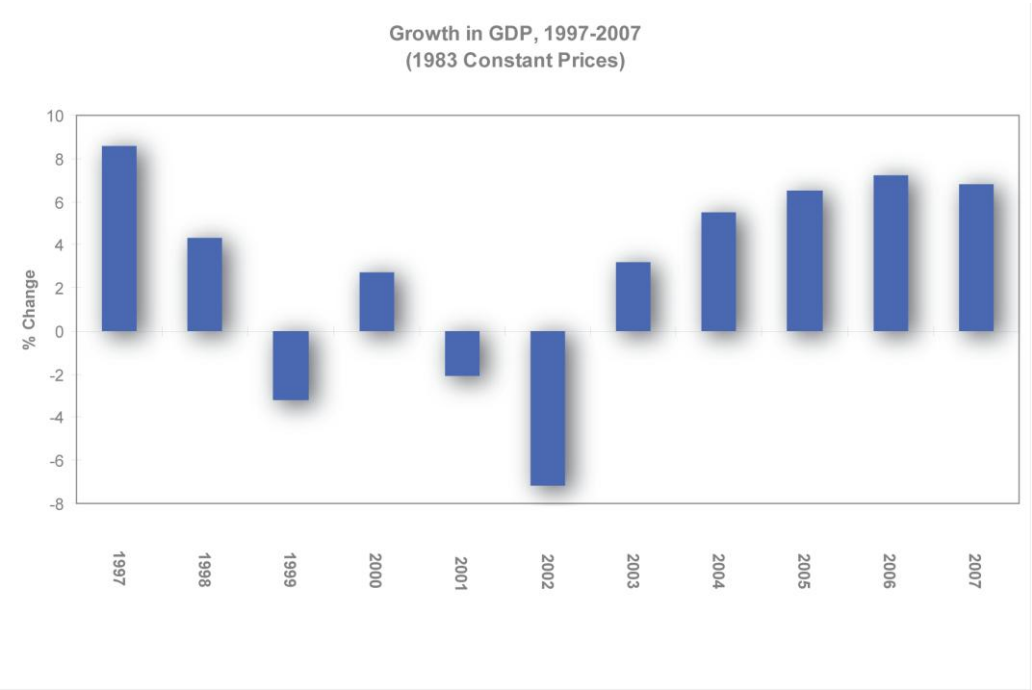
454. Vanuatu suffers from the usual economic growth disadvantages faced by small Pacific island nations, namely:

- Small and dispersed populations;
- Costly provision of basic municipal and transport infrastructure;
- Relatively expensive costs of transporting people and goods between islands; and

- Cultural attitudes, which are often not conducive to active participation in modern economic roles and conducting efficient transactions.

455. From 1997 to 2002 economic growth was extremely volatile and suffered a real economic contraction in this period. This volatility of economic growth at this time, and potentially still in the future, can be largely explained as a function of the narrow base of the economy with limited foreign exchange earners, the significant contribution of agriculture, volatile international commodity prices and exchange rate movements, and vulnerability to natural events such as cyclones. From 2003 to 2007, Vanuatu experienced very strong growth with an average of 5.9% growth per year and a total 33.1% growth over the entire specific period. Tourism can largely be attributed to the rapid recovery and continued growth since 2002 and its spill over effects to the hotel and restaurant, retail trade, real estate and business services subsectors, which all tend to be centred in Port Vila. *Figure 5.3* and *Tables 5.4 and 5.5* illustrate the situation.

Figure 5.3: **Growth in GDP, 1997-2007**



456. The economy is dominated by the services sector, which in recent years, has been the main driver of growth. The sector grew by a total of 34.2% during the 2003-2007 economic recovery period, and the Vanuatu Reserve Bank noted that economic growth in 2007 was driven by services and the construction subsector. Indeed, in 2007 the services sector grew by 7.4% and contributed 73.9% of GDP. As stated above, the base source for much of this growth is being lead by tourism. Air arrivals who require lodging grew 61.3% from 2003-2007, while the hotels and restaurants and real estate and business services grew at 51.7% and 54.7%, respectively over this same period. If tourism is indeed the recent driver of Vanuatu's services sector lead economic growth as it appears to be, and in thinking towards the future, one may wonder how much further can it expand, i.e., is the recent rate of growth sustainable, all else equal?

Table 5.4: **Gross Domestic Product by Industry (Constant 1983 prices) (in million Vatu)**

	2003	2004	2005	2006	2007
Agriculture, Fishing and Forestry	**3,083**	**3,305**	**3,161**	**3,235**	**3,308**
Custom/traditional agriculture	1,745	1,784	1,823	1,879	1,928
Export agriculture	1,174	1,380	1,095	1,165	1,194
Other commercial agriculture	74	71	90	97	84
Forestry and logging	91	70	153	94	102
Industry	**1,542**	**1,625**	**1,741**	**1,862**	**2,056**
Manufacturing	595	625	663	672	701
Electricity and water	410	424	442	454	484
Construction	537	576	636	736	871
Services	**11,311**	**11,883**	**13,005**	**14,139**	**15,185**
Wholesale and retail trade	4,854	4,773	5,316	5,967	6,417
Hotels and restaurants	812	922	979	1,086	1,232
Transport and communication	1,512	1,747	1,988	2,157	2,439
Finance and insurance	1,266	1,346	1,609	1,706	1,746
Real estate and business services	1,129	1,328	1,456	1,622	1,747
Government services	2,207	2,223	2,263	2,274	2,397
Personal services	157	158	160	171	193
Domestic services	143	149	155	162	169
Less imputed bank service charge	769	762	922	1,006	1,154
GROSS DOMESTIC PRODUCT	**15,936**	**16,813**	**17,907**	**19,236**	**20,549**

Source: National Statistics Office: *National Accounts of Vanuatu 2007*.

Table 5.5: **Sectoral Composition of GDP (Constant 1983 prices)**

	2003	2004	2005	2006	2007
Agriculture, Fishing and Forestry	**19.3**	**19.7**	**17.7**	**16.8**	**16.1**
Custom/traditional agriculture	11.0	10.6	10.2	9.8	9.4
Export agriculture	7.4	8.2	6.1	6.1	5.8
Other commercial agriculture	0.5	0.4	0.5	0.5	0.4
Forestry and logging	0.6	0.4	0.9	0.5	0.5
Industry	**9.7**	**9.7**	**9.7**	**9.7**	**10.0**
Manufacturing	3.7	3.7	3.7	3.5	3.4
Electricity and water	2.6	2.5	2.5	2.4	2.4
Construction	3.4	3.4	3.6	3.8	4.2
Services	**71.0**	**70.7**	**72.6**	**73.5**	**73.9**
Wholesale and retail trade	30.5	28.4	29.7	31.0	31.2
Hotels and restaurants	5.1	5.5	5.5	5.6	6.0
Transport and communication	9.5	10.4	11.1	11.2	11.9
Finance and insurance	7.9	8.0	9.0	8.9	8.5
Real estate and business services	7.1	7.9	8.1	8.4	8.5
Government services	13.8	13.2	12.6	11.8	11.7
Personal services	1.0	0.9	0.9	0.9	0.9
Domestic services	0.9	0.9	0.9	0.8	0.8
Less imputed bank service charge	4.8	4.5	5.1	5.2	5.6
GROSS DOMESTIC PRODUCT	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source: National Statistics Office: *National Accounts of Vanuatu 2007*.

457. Agriculture remains the backbone of the economy and is fundamental to the traditional and cash economies. Agriculture is the predominate livelihood activity for the 77% of the population living in rural communities on the outer islands. Although it is relatively small in comparison to the services

sector in the national accounts, it remains the second largest contributor to GDP and provides virtually all of the goods exported from Vanuatu. The sector accounted for 16.1% of GDP in 2007. However, the performance of the sector has been mixed, with both commercial and export agriculture showing significant volatility. The sector grew by only 14.3% from 2003 to 2007 and export agriculture declined by more than 20% in 2005, but has since regained momentum, expanding by 4.6% to 2007.

458. Besides being prone to external factors such as changes in global commodity prices and the adverse effects of cyclones, other problems have also been cited as reasons for the agricultural sector's underperformance, these tending to being issues related to a lack of competitiveness as compared with other island countries in the region. Reasons cited for Vanuatu's reduced agricultural competitiveness stem from internal supply constraints, namely: a lack of efficient low cost transport links to provide access to markets and a lack of a national agricultural policy which has resulted in failed agricultural extension services and poor performance by established cooperatives.

459. It is interesting to note that the 1989 NTDP study stated, "The cooperative movement is the largest locally owned commercial institution and by far the most important economic element in Vanuatu's rural areas. It is instrumental, and in may areas the exclusive element, in facilitating the exchange and marketing of agricultural and non-agricultural product, enhancing business opportunities of industries, in mobilizing rural savings and banking, and in developing/training labour in skills that will be useful including managing small businesses."[26] Of the limited rural sites visited by the Project Team, none of the local cooperatives appeared to be open and operating. A 2008 NZAID funded review of agricultural extension services was undertaken and made a number of recommendations with capacity building being the central theme.[27] The key point in the document is that what is needed is a new agricultural extension system, not merely an attempt to repair the existing program. Should the recommendations of this NZAID report be acted upon, the provision of better market access via improved transport links would be highly complementary.

460. Since the recovery started in 2003 Vanuatu has generally achieved its macroeconomic targets relating to sustained economic growth, balanced budgets, sustainable external balances, and prudent debt management. Inflation exceeded the target threshold of 4.0% in 2007 and 2008, but is expected to fall to 3-4% in 2009. The exchange rate, which is pegged to an undisclosed basket of currencies remains stable. Based on market conditions observed in July 2009, the following exchange rates have been adopted for the Project: USD1 = Vt100 = NZD1.5 = AUD1.2.

461. Merchandise exports are dominated by agricultural commodities, which in recent years, made up more than 85% of domestic exports. Copra, coconut oil, beef, and kava are the chief products exported. Aside from what is produced by the domestic agricultural sector, most other consumption items are imported, such as: tinned fish, flour, rice, frozen chicken, and other food and beverage items, cement, fuels, liquefied gas, pharmaceutical products, household effects, and generally any manufactured goods. Vanuatu has had a long running negative trade balance, which has increased during the recovery because of stagnating exports and increasing imports.

462. Under the Public Finance and Expenditure Management Act 1998 (PFEM), the Government is required to pursue policies that ensure: (i) borrowing is kept at manageable levels; (ii) government assets are maintained in good condition; (iii) fiscal risks are properly managed; and (iv) tax rates are stable and predictable. The long-term fiscal objectives are listed in the 2009 Budget Policy Statement as:

- Maintain a positive recurrent budget balance;
- Establish a broad revenue base with sufficient revenue to ensure a balanced budget (recurrent revenue is forecast at 19.9% of GDP in 2009);
- Ensure recurrent expenditure supports a balanced budget outcome (recurrent expenditure is forecast at 19.2% of GDP in 2009);
- Manage debt at prudent levels (total public debt is forecast to be 19% of GDP in 2009);
- The average annual rate of economic growth is kept above population growth; and

[26] Section IX. ADB, 1989. *National Transport Development Plan, Final Report.*
[27] NZAID, 2008. *Review of Vanuatu's Agriculture Extension Services*. Prepared by Greer Consulting Services.

- Inflation, as measured by the consumer price index (CPI), is kept below 4.0% per annum.

463. In general, the GoV is succeeding in following the PFEM policy directive. Although public debt has risen, the debt ratios are moderate and reflect prudent fiscal policy. However, as evident from the state of maritime infrastructure, government assets are not properly maintained.

464. Lastly, concerning the average annual rate of economic growth, although the recent GDP growth figures from 2003 onward suggest that the country continues to grow despite the global financial crisis, the average annual real GDP growth from 1997-2007 was only an average of 2.2% per annum. It is perhaps a significant observation that this value mirrors the estimated rural population growth rate of 2.2% where the majority of the population are still engaged in subsistence based agriculture, which by its nature, production is related to the number of mouths needed to feed.

465. Although tourism may be the base subsector supporting the overall economic growth of the country with the urban centre of Port Vila being the market hub where much of this growth is being facilitated, it is the rural communities on the outer islands where the majority of the population reside. These rural communities continue to grow slowly, if at all in economic terms, due to various constraints and the lack of services and livelihood opportunity, hence, the continual migration of rural populations to Port Vila. If the country's urban-rural divide is going to be reduced as an attempt to stem the observed rural-urban migration and alleviate some of the increasing demands on Port Vila, coordinated policy and action will be needed to fully utilize the nation's rural agricultural resources and realize its potential. It is not a simple problem of one issue to address and resolve, but rather a complex problem involving both infrastructure and services to ameliorate island disadvantages and thereby promote conducive market conditions to enable greater private sector participation by farmers, traders, and shipping service providers.

5.1.3 Poverty, Inequity, and Rural Economic Sector Profile

466. As stated above, over three quarters of the Ni-Vanuatu population reside in rural communities on the outer islands. The living conditions, services provided, and livelihood opportunities are vastly different than those in Port Vila and Luganville. Rather than cash based economy, life on the outer islands is essentially based on subsistence agriculture and barter, although even rural households usually have some cash on hand to pay for imports such as tinned fish, rice, and school fees for their children.

467. Based on a previous ADB assessment in 2002, it was estimated that 40% of all Vanuatu households lived below the UNDP internationally recognized poverty standard, and further that 51% of households in rural areas were below this level.[28] The recently completed ADB Pacific Island Economic Report for Vanuatu estimated poverty threshold differently based on a required level of expenditure for basic food needs and other non-food essentials in rural communities, Luganville, and Port Vila. It suggests that 12.9% of all households, representing 15.9% of the population, had monthly per capita adult equivalent expenditure less than that needed to meet the basic needs poverty line. Of the urban households in Port Vila where greater expenditure is necessary, an estimated 27.2% of households were below the poverty line, suggestive of the growing numbers of rural migrants becoming this urban poor, living in informal peri-urban informal settlements.

468. Inequality, as measured by the Gini Coefficient calculated by the National Statistics Office, suggests that there is greater inequality in Port Vila than in the outer islands. Similar to the estimated poverty statistic, the higher figure for Port Vila likely reflects the greater level of inequality associated with the rural-urban migration and the increased number of settlers in the peri-urban area. However, this fails to address development issues such as access to: basic electricity and water services, markets and alternative livelihood opportunities, and health and education facilities. Thus, while there may be greater disparity in Port Vila, those in rural communities more equally suffer from the poverty of opportunity. For although it takes significantly more cash income to live in Port Vila as compared with living rural outer island communities due to necessary increased expenditures on food, housing, and transport, the overall levels of urban versus rural poverty as measured by statistics may not be significant or debatable with respect to quality of life, since those living in the outer islands are arguably denied choice.

[28] ADB, 2002, "Discussion Paper, Assessment of Poverty and Hardship."

Table 5.6: **Gini Coefficients of Inequality in Vanuatu**

Region	National Average	Rural	Luganville	Port Vila
Gini Coefficient	0.41	0.40	0.41	0.46

Note: 0 = perfect equality
Source: *Vanuatu: Analysis of the 2006 Household Income and Expenditure Survey: A Report on the Estimation of Basic Needs Poverty Lines and the Incidence and Characteristics of Poverty in Vanuatu*. National Statistics Office. Draft, March 2008

469. As stated elsewhere, agriculture is by far the dominant livelihood activity in the rural outer island communities providing both subsistence and cash incomes. To a much lesser extent, individuals engage in forestry, fishing, and in a few locations, tourism. Therefore in thinking about some form of development intervention, whether it be infrastructure, services, or both, it is these types of livelihood activities which should be analyzed to discover how the intervention may impact upon their livelihood processes with the intent of being to increase rural household productivity through more effective and efficient means of production and getting their goods to market.

470. Virtually all rural households are engaged in some form of subsistence agriculture. A 1994 Garden Survey undertaken as part of the Agriculture Census found that between 91% and 100% of households had at least one garden to provide food for the household's own consumption, wherein any surplus could then be sold or exchanged, either locally or to urban markets if affordable transport is available. In Vanuatu, agriculture commodities are generally categorized as follows: tree crops (fruits and coconuts), cocoa, coffee, kava, beef, and other cash crops such as vanilla.

471. Copra is a low value commodity with an unstable market price due to external factors. In the past, the Vanuatu Commodities Marketing Board (VCMB) had attempted to smooth out the market fluctuations by setting "beach" or "farm gate" prices, but individual farmers usually do not receive this price unless from ship's captain, unless they themselves take the product to a VCMB collection point. For this reason and others, the VCMB has had limited success and indeed has been strongly criticized by stakeholders for not only being inefficient and unaccountable, but also for allegedly having an adverse impact on the industries it attempts to regulate. Indeed, it has been recommended by other studies that the VCMB be abolished. A large proportion of the existing copra plantings are from pre-independence and thus are old with reduced production capacity. Other studies have suggested that smallholder copra production exhibits cultural market rigidities or even worse perverse incentive structures, that is, when the price received by the producer increases, production decreases. Nonetheless, copra remains one of Vanuatu's principal exports and is an important product to most outer island communities because: (i) it is a reliable crop, (ii) required local agricultural skills are minimal and well established, (iii) no cash investment is needed to harvest the large amounts of existing plantations, and (iv) shipping service providers will pay cash, which then can be used to pay for imports and school fees. Over 75% of all copra production comes from individual smallholder landholders with the remainder being sourced from the larger plantations. At the time of this study the price of copra received by producers on the outer islands was Vt20,000 per tonne.

472. Cocoa is a high value commodity but its price depends on its quality. Cocoa production requires more intensive skilled labour inputs than copra, and Vanuatu's production has exhibited a correlated lag to world prices.[29] Espiritu Santo and Malekula are the two major cocoa production areas, producing 20% and 55-60% of the national total, respectively. Efforts have been made to increase the quality of the cocoa produced in Vanuatu, but as stated previously, changes are needed in the agricultural extension services. Additionally, cocoa is purchased from the producer on the outer islands without any quality assessment, hence, only a low grade price is offered to the smallholder producer. Once it is transported to Luganville, payment is made to the shipping service provider by the processor based on its assessed quality, hence, market forces to increase quality and seek a higher price do not transcend to the smallholder producer. Additionally, cocoa producers need a storage facility and prefer not to use landing craft because cocoa quality will be damaged or all together spoiled if it gets wet. The current cocoa price was Vt120,000 per tonne.[30]

[29] Production may continue downward some years after global price rise, or vice versa.
[30] While likely remaining volatile, the price of copra and to a greater extent coconut oil, is expected to rise given its increasing use in consumer goods, organic or standard, and more significantly as bio-fuel to be used in soon to be implemented Vanuatu Rural Electrification Plan.

473. Small quantities of coffee are produced, mainly on Tanna for both domestic consumption and export. Coffee production had been at significantly higher levels before declining late in the colonial period. Apparently, rather than replant, many of the colonial plantations opted to allow output to decline as if they foresaw their forthcoming exit from the market. This downward trend has reversed itself with the limited success of smallholder projects on Tanna, however, coffee remains a small contribution to the agricultural sector relative to the other principle products.

474. At present, kava production in terms of its total value is likely the most important outer island crop. Aside from robust domestic consumption, exports of kava have risen with an estimated 1246 tonnes exported between 2006-2008 and is the second most valuable export commodity after copra. Unlike copra, production of kava is not uniform, with Pentecost being the primary producer and reputed to have the best and strongest quality. Given trends, kava production is expected to increase in production, principally on Espiritu Santo, Ambae, and Maewo. The current price of kava was Vt150,000 per tonne.

475. Beef is produced on a number of ranches and supported by two abattoirs, one on Espiritu Santo and one on Efate. Vanuatu has established a reputation for high quality organic beef and it has become a reliable export commodity yielding Vt241 million in 2008. Despite an increase in beef production from smallholder market entrants relative to the larger established ranches to a point where the two types of producers almost have equal shares of national production, most of the herds remain produced on Espiritu Santo and Efate, in relative close proximity to the abattoirs. That is, the nation's increased production from more numerous smallholder producers remains clustered around the longer established larger producers rather than being resultant from dispersed outer island rural production. Should agricultural extension services improve, increased cattle raising or fattening in remote communities would certainly be something to be explored in concert with suitable inter-island craft and service capacity to transport cattle to the closest abattoir.

476. Other high value cash crops suitable to Vanuatu's environment such as vanilla or nuts could be investigated. Vanuatu is reportedly one of the world's best producers of vanilla. However, this will hinge upon the development of better agricultural extension services to assist in overcoming: lack of knowledge of growing processes, limited access to credit, developing market linkages, processing and storage facilities, and coordinating trade links with more reliable transport.

477. Most of the fish caught in the outer islands is for subsistence consumption or for exchange within the fisherman's locality. Sales to the two urban markets or for export are small and not documented. This may be due to the lack of cold stores and consistent reliable transport. There are limited electricity sources in most outer island villages and generator fuel costs are high. A rural electrification plan making use of renewable sources, including bio-fuel from coconut oil has been proposed for implementation. Recently, a Chinese sponsored fish processing plant was opened in Port Vila.

478. As stated earlier, tourism plays a significant and growing role in the Vanuatu economy. However, most tourists' movements, and associated expenditures, are to or through the two urban centres of Port Vila and Luganville. Despite Pentecost having annual "nagol" or land diving, one of the premier tourist attractions in the region, less than an estimated 1000 tourists visit the island per year and half of those are during the two month nagol season. Tanna, with its kastam village and active volcano, is the most visited outer island for tourism, however, access to the tourism sites on the island are quite distant from the airport. Nonetheless, given the state of inter-island shipping and without having any hard data, it is safe to assume that most foreign tourists venturing to the outer islands from Port Vila or Luganville will be making use of air services and associated land transport once there.

5.1.4 Regional Economic Development Plans

479. The proponents of the Regional Economic Development Initiative (REDI) were the Ministries of Lands, Internal Affairs, and Trade and Agriculture. The initiative was designed to focus on the policies and resources of all levels of the government on the economic development opportunities in the outer islands. Started in 1999 in line with the initiatives under the ADB funded CRP and with the aid of numerous donors, an economic development strategy, in the form of a five year Regional Economic Development Plan, has now been drafted for all six provinces. The process of developing these plans was one of engagement with local communities at the grassroots level whereby top-down strategic planning was married with a bottom-up process of needs assessment and project ranking. Each of the plans, although different per individual province, analyzed the provincial economic sector

potential in concert with local, provincial, and national policies and plans, then conducted an assessment of priority needs in terms of infrastructure, training, and support services. The end result was a plan inclusive of development strategies, a list of goals, and priorities.

480. Among others, three priorities of the Penama Province plan, which includes the islands of Ambae and Pentecost are the following: (i) build wharves and storage facilities at strategic sites to facilitate marketing of agricultural and marine products, (ii) introduce micro-lending schemes to stimulate economic activity in the communities, and (iii) establish markets and assist producers to be more organized to market their produce more effectively. Relevant specific goals included:

- Create an environment conducive to business development and investment through establishment of a wholesale operation in Penama and a more reliable system for the delivery of services including transport and retail services.
- Develop proper infrastructure to facilitate economic development including establishing a reliable shipping network, constructing a main wharf at Lolowai, rebuilding the cyclone-damaged Narovorovo wharf, and construction of storage facilities at Loltong, Bwatnapni, East Pentecost, Lolowai, Lolopuepue and Narovorovo.

481. Malampa Province, which includes the islands of Malekula and Ambrym, had a number of different sub-plans given the size of the geographic area covered and differences in the economic circumstances of populations living in those specific areas. Indeed, the overall plan was essentially a construct of the separate plans of areas governed by different area councils. As related to this intent of this Project, the following are the relevant priorities espoused by the plan:

- West Ambrym – Craig Cove wharf and storage shed need to be rehabilitated and upgraded and a producer organisation to facilitate the supply of products to expanded markets needs to be established.
- South Malekula – Rehabilitate and upgrade the existing wharf at Port Sandwich and establish regular shipping connections in the south on Malekula between Port Sandwich, Akhamb, and Farun, and better inter-island shipping between Port Sandwich, Ambrym, Paanma.
- Central Malekula – Improve infrastructure and services including shipping from Litz Litz to Port Vila and upgrading the jetty at Lakatoro.

482. Torba Province, which is located in the far north of the country and includes the sparsely populated Banks and Torres Islands stated that a priority goal was improved shipping services and island trade links. The plan cited that one of the biggest constraints facing the economic development of the province is the absence of a reliable and competitively priced shipping service to and from the islands of Torba to the rest of the country. Interestingly, the strategy to overcome this constraint recommended a commercial solution, rather than the possibility of procuring a province-owned vessel. However, the plan cited needed actions on the part of the GoV with specific reference to following up on the recommendations stated in the 1993 ADB Inter-island Shipping study. In terms of infrastructure, the plan expressed need for landing stages along with roads, but clearly the more urgent priority is the shipping services themselves.

483. A goal of the Sanma Province plan, which includes the islands of Espiritu Santo with its urban export centre of Luganville, is improved shipping services and inter-island links. The major constraint cited by the plan is the limited transport options to the highly productive north, northwest, and west agricultural areas. In lieu of trying to develop expense overland transport links via roads, the report envisaged the use of shipping but noted that the current service as “highly unreliable.” Similar to the recommended action of the Torba Province, the plan cited the needs for the GoV to act upon the recommendations of the ADB 1993 Inter-island Shipping study with specific reference to subsidizing private sector operators to make more frequent and consistent calls to those areas in need.

484. The plan of Tafea Province, which includes southern islands of Erromango, Tanna, Futuna, and Aneityum (Anatom), listed a competitively priced, reliable shipping service to Tanna and the outer islands and a fully-functioning wharf at Lenakel as two priorities. Based on this comment, and other places in the plan that called for an upgrade of Lenakel Wharf and ancillary facilities such as cold store, it would appear that the existing wharf at Lenakel is not functioning as per its design. In terms of the development constraints, the plan cited that a lot of infrastructure had been built, but that it was not being maintained properly and there was confusion over responsibility for the upkeep of the

infrastructure between the PWD and the Provincial Government. With respect to the priority of having better access to reliable shipping services, similar to other provincial plans, the Tafea plan cited the need for the GoV to act upon the 1993 ADB Inter-island Shipping study recommendations, but also left open the idea of owning its own vessel if the GoV could not remedy the situation. The plan also remarked about the failure of the VMA and related shipping safety for users, specifically noting the VMA's demarcation of Waisisi a port of entry in 2005, but that the present anchorage at Waisisi needed upgrading.

485. Two key plan goals of the Shefa Province, which is composed of Efate, Epi, and Shepherd Islands, were: (i) provide facilities for agricultural production, marketing, and trade including commercial market centres and village cooperatives; and (ii) develop and improve the efficiency and reliability of transport infrastructure through increased competition amongst shipping service providers and rehabilitation of wharves and jetties. In terms of specific maritime infrastructure, the plan consolidated the stated demands of the various area councils with following priorities:

- Upgrade the Port Vila Main Wharf;
- Upgrade the Star Wharf;
- Rehabilitate the Lamen Bay Wharf;
- Construct new jetties on the islands of Emae, Nguna, Pele, Emau, and Moso.

486. Although the six REDI's were developed individually by the Provincial Governments and participating Area Councils, there are some clear trends that are observable across the six plans:

- The provided shipping services in terms of reliability, consistency, safety, and high cost are perceived as a constraint to development that may be mitigated by the introduction of a GoV sponsored shipping support scheme as per recommendations in the 1993 ADB Inter-island Shipping Study.
- Shipping services is only one facet of the perceived constraints on rural development and movement of goods to market, with other related constraints pertaining to the lack of storage facilities, lack of wholesalers and/or lack of functional cooperatives, and lack of micro-finance facilities.
- In general, maritime infrastructure remains a priority, but appears to be focused on the upgrading and rehabilitation of existing facilities that have either been damaged or destroyed by cyclones or have otherwise been degraded in envisaged functionality from improper design or a lack of adequate maintenance.

5.1.5 Summary

487. Similar to other small Pacific island nations, the economy of Vanuatu is at a disadvantage given small dispersed populations and resources, and the relatively high costs of providing such remote communities with the infrastructure and basic services to stimulate productivity gains. The economic dualism between the two urban centres and the rural outer island communities that existed during pre-independence remains. Tourism and its spill over effects to other services subsectors have been a major driver of economic recovery and growth since 2003, yet with its focal point being Port Vila, the demands associated with the growth of tourism has only accelerated the rural-urban divide. Agriculture remains the principal livelihood activity for the majority of the population, yet productivity in this predominately rural sector suffers from a lack of policy, associated extension support services, and cost effective reliable access to the two urban markets.

488. Aside from what is produced by the domestic rural agricultural sector, most other consumption goods are imported. These imports usually transverse the port areas of either of the two urban centres of Port Vila or Luganville before being shipped to rural outer island communities. The nation's exports are primarily composed of its agricultural products, namely: copra, coconut oil, beef, cocoa, and kava. Similar to the imports, these locally produced agricultural commodities are usually shipped to Port Vila or Luganville prior to export. On an individual household level for the majority of the population living in the rural outer island communities, the surplus agricultural commodities produced that are not used for subsistence consumption are sold to generate the income to pay for the imported consumption goods.

489. Despite the economic recovery since 2003, longer term annual average economic growth appears to be closely correlated with rural population growth. This is not surprising given that the

majority of the population remains in rural communities whose livelihood is largely based on a subsistence economy. In order to achieve more sustainable and equitable economic growth, the productivity of these rural populations needs to be increased, which should translate into increased consumption and higher living standards. Aside from other external donor sponsored project or study initiatives, both past and present, whether these have been focused on transport and agricultural infrastructure and associated services, the REDI and associated regional economic development plans produced by the provinces with external aid offer some insight into the self perceived development constraints in terms of infrastructure, institutional issues, and provision of services in addition to lists of goals, strategies, and priorities.

5.2 Relevant Sector Policy, Development Plans, and Previous Project Experience in the Vanuatu Maritime Sector

490. The ADB financed Comprehensive Reform Program (CRP), implemented over an eight year period from 1997 to 2005, was a major development initiative in response to fiscal fragility, political instability, economic stagnation, inefficient public administration and poor social service delivery. As a catalyst for reform, the CRP identified the following infrastructure related policy issues:

- User charges need to be applied as a means to move towards full cost recovery of infrastructure investments;
- Where possible, infrastructure provision and related services should be contracted out to the private sector;
- Existing infrastructure is in a poor state due to a serious neglect of routine maintenance;
- The state of the nation's infrastructure is constraining economic growth and business development;
- There is a need to establish infrastructure subsector master plans; and
- The regulatory framework, including enforcement, needs strengthening in order to promote efficient and effective operation and management of infrastructure.

491. The GoV's medium-term strategy for development is outlined in the *Priorities and Action Agenda 2006-2015* (PAA). The priorities and approach set out in the PAA are consistent with those developed under the CRP and with the ongoing AusAID funded Governance for Growth (GfG) program, with an overall objective of linking policy and planning with the limited resources under the control of the government. The relevant priorities and goals in the PAA are:

- Creation of an environment for private sector led economic growth and employment creation;
- Provision of better basic services, especially in rural areas;
- Provision of economic infrastructure and support services;
- Lower the costs of doing business through reduced costs of transportation and utilities;
- Improve operational efficiency in the ports and improve management of the maritime sector;
- Expand access to markets for products from rural areas;
- Improve roads, jetties, and other infrastructure in the rural outer islands areas.
- Maintain and upgrade existing maritime infrastructure; and
- Review the Infrastructure Master Plan, prioritize projects, and integrate project planning across sectors.

492. The current GoV, which came to power in September 2008, used the priority areas in the PAA as a starting point in the development of a four year strategy to address specific priorities, presented as *Planning Long, Acting Short: Action Agenda for 2009-2012*. Success in all of the areas identified by the government will require it to overcome the policy inertia that presently exists and to

substantially improve policy implementation. A key relevant policy priority is to provide reliable and accessible infrastructure services. Two strategies to achieve this priority are to: (i) strengthen the institutional capacity of the MIPU, and (ii) improve shipping, wharf, and storage facilities. The following indicators will be used to assess the current GoV's performance towards implementing the strategies and achieving the policy priority over the 2009-2011 period:

- A capacity building program for MIPU is implemented and functioning;
- Infrastructure policies and implementation plans are reviewed and improved;
- Policy, legal, institutional and governance of the domestic shipping industry is strengthened;
- Management and oversight of current stevedoring concession agreements is improved;
- Strategy for long-term wharf and stevedoring services is developed and embarked upon; and
- Feasibility studies on perceived maritime infrastructure needs is completed.

493. There have been numerous project studies in the last 30 years on transport development in Vanuatu, most of which deal in one way or another on the need for efficient transport on the outer islands, where the majority of the population reside, and facilitating the movement of people and goods to and from these locations to the two urban centres of Port Vila and Luganville. Given the archipelago nature of the country, there has naturally been substantial attention given to domestic sea transport with a focus on perceived maritime infrastructure requirements and an awareness of the need to induce adequate inter-island shipping services to uneconomical routes. The latter being those routes for which due to characteristics associated with the origin or destination nodes such as distance, population, and passenger or cargo volumes and associated market conditions, private sector provision of shipping services is generally precluded from profitable operations. For purposes of economic development, equity, and general promotion of national unity as well as alleviation of growing urban pressures, it is widely accepted that there is a need to provide essential inter-island shipping services to remote communities in the outer islands, where passenger and cargo volumes will not support the additional costs of having more frequent, regular, and consistent service.

494. Previous project performance and studies have been reviewed and used in varying degrees to form the basis for this study's analytical framework, subproject site selection, economic methodology and model, and overall understanding of the Vanuatu maritime sector in a historical development context. As further detailed below, the following reports have been specifically reviewed:

- JICA 1985, The Basic Design Study of Construction of Outer Island Commercial Centres in Vanuatu.
- Wilbur Smith and Associates 1989, ADB TA 965-VAN, National Transport Development Plan, Final Report.
- ADB 1996, ADB Loan 766-VAN (SF) Multiproject Loan, Project Performance Audit Report.
- PPK Consultants 1993, ADB TA 1525-VAN, Vanuatu Interisland Shipping Study, Final Report.
- ADB 2000, Vanuatu Infrastructure Master Plan – Transport Infrastructure, Staff Consultants Report for Republic of Vanuatu and ADB.
- PPK Consultants 2003, ADB TA 3224-VAN, Vanuatu Outer Islands Development Project, Phase 2 Report.
- McGregor & Company 2008, NZAID, Vanuatu Interisland Shipping Study, Phase I, Final Report.
- Egis BCEOM 2008, AFD, Feasibility Study on the Establishment of a Reliable Port Infrastructure on Tanna Island, Final Report.

495. Despite the relatively large number of maritime transport and shipping support project design and planning studies undertaken by various donor agencies since 1980, it should be noted that over

this 30 year period only two such project preparation studies have subsequently resulted in any follow-on implementation involving the construction of maritime infrastructure. These two projects being the 1985 JICA study on outer island commercial centres and the 1985 ADB multiproject. The JICA study resulted in the construction of two large wharf facilities: Litz Litz on Malekula and Lenakel on Tanna; while the 1985 ADB study resulted in the construction of six outer island facilities of various types and the rehabilitation of the government owned wharf at Santo Port.

5.2.1 JICA funded Basic Design Study Report on the Construction Project of Regional Commercial Centres in Vanuatu

496. Following independence in 1980, the GoV soon established its first National Development Plan for the period of 1982-1986. A central goal of the plan was to achieve economic independence or self-sufficiency within the next 15 year period principally through rural agricultural productivity enhancement. It envisaged a number of regional construction projects such as commercial centres, cold store facilities, and wharves that would assist in the promotion and consolidation of agricultural products for eventual export.

497. In 1985 JICA financed a study to assess the feasibility of the plan. This study recommended the construction of four regional commercial centres at:

- Litz Litz, Malekula,
- Lenakel, Tanna,
- Lolowai, Ambae, and
- Craig's Cove, Ambrym.

498. Two rural wharves were at the proposed commercial centre sites of Litz Litz, Malekula and Lenakel, Tanna, were recommended and eventually constructed in 1988. At the time of the JICA study there were existing jetty facilities in use at both the Lolowai, Ambae and Craig Cove, Ambrym locations.

499. Although designed for a 50-year project lifecycle, the facility on Lenakel was significantly damaged by a severe cyclone in the mid 1990s, however, it was subsequently rehabilitated in 1998. Today, both wharf structures are reasonably well utilized: Litz Litz with about 500 ship calls per year and Lenakel with about 100 calls. Both need various relatively minor repairs to ensure their long-term sustainability. Additionally, given trend changes in the composition of the fleet since their initial design other potential works, such as a design amendment or addition, may be considered to increase the scope of vessels that may use them on a regular basis without causing any significant damage or reduction in expected project design life. Lolowai and Craig's Cove remain commercial centres, but lack any wharf facility as their previous jetties have either been destroyed by a cyclone as in the case of Craig's Cove, or simply exceeded their design life as in the case in Lolowai.

5.2.2 ADB funded Multiproject

500. Initiated in the mid 1980s, the rationale for this project was based on the need to improve internal transport and interisland facilities in copra producing islands. The project comprised construction of outer island infrastructure in the form of: wharves and landing stages, rural feeder roads, preparation of the detailed engineering design for Santo Port, and upgrading and reconstruction of schools destroyed by cyclones. Although the technical assistance and loan processing was completed in 1985 and 1986, respectively, implementation was delayed by four years and the project implementation was not completed until 1992.[31] Likely due in some part to the significant delay from loan effectiveness to actual implementation, there were significant changes in scope, facility design, and specific location of subprojects when the works were actually constructed.

501. The 1993 Project Completion Report (PCR) concluded that while the project objectives for the schools were met, those for the roads and Santo Port were only partially met, and those for the wharves and landing stages were not met. Even within a few years following project completion, it was clear that there were a number of problems with the constructed subprojects, particularly with the

[31] The project formulation was undertaken via an ADB fact finding mission rather than through the typical technical assistance process and thus relied heavily on the DFID financed 1982 Posford Report, which reviewed some 150 anchorages throughout the country. In the course of this study, the elusive Posford Report has not been obtained.

three wharves and three landing stages. For the most part the facilities were deemed to be inappropriately located for consistent and sustainable operations given tides, reefs, risks of storm damage, and associated structural designs. Additionally, the actual construction of the works by local consultants and contractors was deemed to be substandard and cited the need for greater GoV project supervision. For example, there are no as-built drawings for any of the constructed maritime infrastructure works.

502. Collectively, the PCR and other observations facilitated the need for a Project Performance Audit Report (PPAR), which was eventually completed in 1996. The report concluded that the project was unsuccessful citing poor utilization of the roads and maritime infrastructure. Overall, the re-estimated subproject economic internal rates of return of the transport facilities conducted at post evaluation were much lower than those calculated at the time of appraisal and indeed some were negative.

503. The present status of the six specific maritime infrastructure sites constructed from the project are described here:

- Sola Landing Stage, Vanua Lava – Not sited to Posford Report recommendation, in too shallow water for intended use.
- Narovorovo Wharf, Maewo – Not sited to Posford Report recommendation, specific location changed three times during implementation, then in the course of construction was significantly damaged by a storm and was not fully restored due to its inappropriate location.
- Nduindui Wharf, Ambae – Rarely used because of insufficient water depth and inappropriate design.
- Liro Landing Stage, Paama – Not used, incorrectly sited due to design or construction error, approach for vessels is hazardous due to rocks and coral heads.
- Lamen Bay Wharf, Epi – Rarely used due to hazardous rocks, coral outcrops, and insufficient water depth, location changed three times during construction.
- Lolupueue, Ambae – Used to some extent, but not to appraisal expectations.

5.2.3 ADB funded National Transport Development Plan

504. In the late 1980s with the gradual withdrawal of budgetary support from the British and French governments following Vanuatu's independence, the ADB provided technical assistance to the GoV in the preparation of a national transport development plan (NTDP). Up to that time a number of feasibility studies had been undertaken, however, these tended to focus upon individual projects and were subsector specific being usually concentrated on one transport mode alone and a single type of infrastructure intervention. Whereas in Vanuatu, given its geography as an archipelago nation, commerce and transport, and indeed economic development is largely dependent on a transport network comprised of different modes, particularly roads and shipping.

505. The NTDP conducted an inventory of Vanuatu's transport infrastructure and a condition assessment. The capacity of the transport network was then analyzed in concert with services offered with a focus on current usage trends and forecasted demands given the countries predominant economic sectors. With respect to the domestic marine sector, many of the constraints identified by this 1989 report are still present today such as:

- inadequacy of inter-island services to the fringe and outer areas;
- an oversupply of ships for tonnage of freight available has lead to lack of investment in more modern ships;
- lack of adequate domestic wharfage and berth capacity;
- restrictive stevedoring arrangements at Port Vila and Santo;
- unreliable agricultural supplies, i.e., cargo demand;
- inadequate storage facilities and space;
- lack of equipment at the Marine Training Centre;

- insufficient navigational aids; and
- an aging fleet.

506. In addition to specific transport development projects that were identified for priority investment as funds became available, the report also identified a number of institutional and policy constraints and potential reform solutions such as:

- coordination of transport and development planning with a focus on intermodal linkages;
- need for creation and maintenance of a transport database detailing cargo, passengers and movements, services offered, and inventory of infrastructure;
- reorganization of the ports administration;
- consistent policies on maritime infrastructure maintenance and collection of fees charged for O&M; and
- enforced policies on shipping safety.

507. The plan inclusive of institutional capacity building, legal and policy reform, and infrastructure development was segmented in three five-year programs based on a prioritisation methodology. Unfortunately, the proscribed three progressive programs were generally not acted upon as recommended and the NTDP was essentially shelved.

5.2.4 ADB funded Vanuatu Inter-island Shipping Study

508. A number of the recommendations made in the NTDP identified the need for further study, particularly in the maritime sector. In 1993, the ADB supported the Vanuatu Inter-island Shipping Study (VISS), which was designed to assist the GoV in the formulation of policies and plans to improve the efficiency and quality of inter-island shipping and essentially takeover from the NTDP left off. Particular attention was given to:

- shipping policy development;
- management and regulation of the inter-island shipping sector; and
- development and technical expertise in the shipping industry.

509. Based on an assessment of the then present inter-island maritime sector in terms of the demand for shipping services, existing fleeting and operations, GoV institutional structure and regulation, the principal needs of the sector were deemed to be the:

- legal and regulatory framework which sets out objectives and rules to guide the sector with focus on the need to update legislation, establish safety standards and provide consistent enforcement, and generally meet accepted international obligations and conventions;
- provision of shipping services in terms of fostering private sector investment for a competitive and efficient market supply; and
- support services to implement the legal regulatory framework and create an enabling environment through the development and maintenance of NAVAIDs, better management of ports, and meeting the training needs of the domestic industry better.

510. The report made a number of recommendations in three broadly defined needs based categories of:

- government policy and management – marine legislation, marine safety enforcement, shipping regulation, and subsidization of services to uneconomic outer island routes;
- development of the shipping industry – rationalization of the government fleet, and promotion of energy efficient ship investment by the private sector; and
- strengthening the supporting sectors – creation of a ports authority, prioritise investment and maintenance of outer island ports, upgrade NAVAIDS, foster a domestic market for new ship construction, support slipway refurbishment, support

finance for fleet renewal, encourage development of a shipping industry group, and institutional reorganization of relevant GoV departments.

511. All of the recommendations were soundly predicated on the principles of private sector provision of services with the GoV acting as regulator and competition enabler. Some of these recommendations such as rationalization of the government fleet have been accomplished, albeit not necessarily in an efficient manner, while some others have been attempted but have not been successful such as government institutional reorganization and marine safety enforcement, whilst others have not yet to be acted upon. Several of the study's key legislative recommendations have been implemented in the proposed or a slightly modified form, notably the following:

- The Coastal Trading (Control) Act, which imposed unnecessary licensing restrictions on coastal trading for all types of vessels was repealed in 1999;
- The Ports (Amendment) Act was passed in 1999, increasing the number of ports of entry to seven including Port Vila, Luganville, Lenakel, Loltong, Sola, Anelghowhat, and Litz Litz, as well as to specify that all vessels, including foreign vessels, have a right to service these ports; and
- The Vanuatu Maritime Authority Act No.29 of 1998 established the Vanuatu Maritime Authority (VMA) with responsibility over all maritime safety and regulatory functions including NAVAIDs, licensing of vessels, administration of the International Ships Registry, and search and rescue services.

512. With respect to a strategy for outer island maritime infrastructure, the report correctly recommended that any future investment be carefully analyzed. This was based a comparative analysis modelling of shipping costs between "bus stop" versus consolidated operations, an expectation of significant forthcoming changes in the domestic fleet composition towards bow ramped vessels, and likely, the recent unsuccessful experience with the wharf and landing sites constructed under the examined ADB Multiproject Loan.

5.2.5 ADB funded Vanuatu Infrastructure Master Plan

513. As a condition of the ADB funded CRP loan, the GoV was committed to participate in the preparation of a Vanuatu Infrastructure Master Plan (VIMP). Rather than take the form of a prepared list of potential subprojects, the VIMP offered a policy framework to address development and institutional issues, the findings of which closely match those of earlier studies, namely citing problems such as:

- The lack of clearly defined responsibilities for maintenance between national and provincial governments, and conflicts between them concerning revenue bases and distribution of funds;
- No transport planning unit responsible for forward planning; and
- A lack of planning legislation to process development proposals.

514. With specific focus on the ports and shipping subsector, the VIMP recommended priority be given to:

- Updating the asset register of wharves and ports created by the 1989 NTDP;
- Ensuring that ports and wharves are maintained properly through the active involvement of all stakeholders such local communities and business, provincial governments, and national agencies;
- Operating Port Vila and Santo wharves on a commercial basis via a Ports Authority with an emphasis on the provision of low cost services in line with comparative regional and international benchmarks;
- Improve maritime safety through equipment procurement, retiring unseaworthy vessels, and strengthening and supporting the VMA;
- Ensuring that the international port development capacity matches envisaged forecasted growth in traffic; and
- Opening up inter-island shipping to encourage foreign investment and competition.

515. Lastly, in terms of institutional issues that constrain effective maritime infrastructure maintenance, the VIMP cited the points and recommendations:

- DPH lacks the ability to carry out physical maintenance works and therefore the institution needs to be strengthened through the appointment of engineers and technical staff in conjunction with better coordination with PWD who should take overall responsibility, whether this be actually accomplished by PWD or as the managing contractor of subcontractors, for the construction and maintenance of outer island maritime infrastructure; and
- Given the lack of financial or technical resources in the outer island provincial governments or local communities, a national wharf maintenance fund should be created from shipping license fees and received port charges to assist in financing the efforts of DPH and PWD.

5.2.6 ADB funded Outer Islands Infrastructure Development Project

516. In late 1999, the ADB financed technical assistance entitled Outer Islands Infrastructure Development Project (OIIDP) commenced with the overall objective to promote economic development through the provision of identified infrastructure needs in the outer islands. Building on the sixty-five recommendations in the NTDP that the study still considered valid, the OIIDP sought to develop a methodology of subproject selection for inclusion in an infrastructure development program concentrating on rural outer island demands. The subprojects focused on the development of the nation's transport network and the intermodal relationship of roads, airstrips, and port facilities.

517. It should be noted that the project was implemented while the CRP was ongoing, which provided a policy framework for institutional development. As related to infrastructure provision, the CRP attempted various reforms to promote streamlining of GoV agencies such as the Ports and Marine Department and establishment of the VMA, whilst improving the government's role as a planner and regulator. Additionally, as noted above, a condition of the CRP, the preparation of the Vanuatu Infrastructure Master Plan (VIMP) was also simultaneously ongoing. Collectively, these three ongoing initiatives were expected to further many of the recommendations NTDP and VISS in terms of infrastructure planning, legal and institutional reform, and project implementation.

518. Using the NTDP, the VIMP, and internal GoV plans, the OIIDP initially considered a long list of some 171 potential projects. Using a set of basic criteria confirming specific aspects of the long listed projects such as:

- sufficiently advanced project concept as an identifiable infrastructure project with a objective of promoting economic development;
- proposed infrastructure concept intended to for public use and ownership, not private;
- no serious known land disputes involving proposed site; and
- provincial and local perception of concept as being high priority.

519. This initial screening process resulted in a reduced list of 49 potential subprojects for further consideration. These were then subjected to a second screening via multi-criteria analysis (MCA) process according to the following four weighted criteria:

- level of community support (30%);
- likely sustainability (20%);
- likely impact on economic development (30%); and
- population cost ratio (20%).

520. The top 30 scoring road, marine, and airstrip transport subprojects were then selected as the OIIDP shortlist. Based on population, level of increased economic activity and land use, gains to consumer surplus from increased access to more efficient transport infrastructure and markets, and estimated macroeconomic impact, the methodology prioritised these 30 subprojects based on estimated returns to the nation and made recommendations for implementation. Indeed, the study results of the OIIDP partially formed the basis of the Government Investment Program (GIP) intended for financing through an ADB loan. Unfortunately, the proposed loan was not processed due to other ongoing domestic fiscal and political issues.

521. However, the recently proposed US funded Millennium Challenge Corporation (MCC) project revisited the OIIDP analysis. In their final proposal to the GoV in 2005, which was subsequently signed and is now being implemented, the MCC recommended the construction of 12 subprojects, most of which were from the OIIDP prioritized subproject list, or slight modifications thereof. Due to the largely unforeseen devaluing of the US dollar against world currencies, a concurrent rise in commodity prices, and perhaps a general underestimation of overall project costs, the realized budget of the MCC in terms of real purchasing power was significantly less than planned. With little alternative, the MCC program was scaled back and focused only on the civil works of the two largest subprojects: the rehabilitation and upgrading of ring roads around the two major urban centres on the islands of Efate and Santo. Fortunately, with a growing program and fuelled by some initial successes, AusAID's GfG facility decided to fill the vacuum with the development of the Vanuatu Transport Sector Support Program (VTSSP). While the VTSSP's objectives are focused on the process of building capacity in the MIPU and PWD, it will use road rehabilitation subprojects as a "learning by doing" vehicle. The three subprojects to be implemented under the VTSSP from 2009-2011 were selected from the list of dropped MCC projects following consultation with the GoV, and are located on Tanna, Malekula, and Ambae serving as land linkages from hinterland areas to key commercial centres and wharves for eventual commodity export via inter-island shipping.

5.2.7 NZAID funded Vanuatu Inter-island Shipping Study Phase I

522. In early 2008, NZAID funded a new Vanuatu Inter-island Shipping Study (VISSP1) with the aims of analysing the current inter-island shipping situation and related infrastructure, provision of services, governance, management, and policy, legal, and regulatory framework issues. It was agreed that this study would build upon and update the earlier comprehensive sector study financed by the ADB in 1993. As per agreed design, the study was to consist of two phases whereby Phase I would provide the review of the prevailing conditions in the maritime sector with a focus on constraints and inefficiencies in concert with associated future trends and options for addressing any impediments to more efficient operations and economic growth. Conclusions from Phase I would include options for improvement and following decisions on priorities and funding support, a Phase II may be undertaken to develop a detailed project proposal.

523. The Phase I study met its objectives and provided a concise yet comprehensive snapshot of Vanuatu's current inter-island shipping sector consisting of an analysis of present supply and demand of shipping, the institutional capacity of the relevant agencies, and the legal, regulatory, and policy framework in which the sector actors operate. Cognizant of the Phase I study's time and resource constraints, in addition to a lack of accurate and readily available data, the study was forced in some areas to rely heavily on the earlier 1993 study. Instead of simply recommending that the originally proposed eight Phase II tasks of completing the design of a project proposal for implementation of sector improvements and reforms be acted upon, the study recommended the addition of specific Phase II tasks in the areas of: voyage chartering, domestic shipping coordinator scheme, infrastructure improvements, and policy, institutional, and legal improvements.

5.2.8 AFD funded Tanna Reliable Port Infrastructure Feasibility Study

524. Unbeknownst to the 2008 NZAID VISSP1 team, an AFD financed team was simultaneously undertaking a feasibility study on three candidate Tanna wharf alternatives for the Public Works Department (PWD). The rationale for this study was that the present Lenakel wharf, funded by the earlier 1985 JICA study, is completely open to the ocean and thereby presents challenges for vessels trying to use it under certain weather and sea conditions, and more significantly that it is perceived to be at risk of loss from severe cyclone events, such as that which occurred in 1993, hence, it is deemed unreliable. Tanna is a provincial and commercial centre being the main island in a group of five islands that constitute the Province of Tafea and yet Lenakel is its only port at present.

525. The study analyzed three locations on Tanna for an alternative wharf facility: Lenakel, Waisisi, and Port Resolution. The first site being the existing site on southwest coast whereby remedial civil works would be undertaken to try and mitigate the operational issues and risks posed by severe cyclone events. Waisisi is located on the northeast side of Tanna in a relatively large bay and is located close to significant populations and agriculture production areas. Port Resolution is similarly located on the northeast side of the island, and indeed in a protected location where yachts are known to anchor, but where the water depth is deemed to be shallow and prone to sedimentation, thus dredging would be required to facilitate the use of inter-island vessels. Port Resolution is also in close proximity to a major tourism attraction. Both Waisisi and Port Resolution are expected to be

better linked to Lenakel after the AusAID funded VTSSP completes rehabilitation of the main road that transects the island of Tanna.

526. The AFD study completed an analysis involving appraisal of the sites based technical engineering requirements, economic feasibility, and minimization of social and environmental risks. Aside from looking at the alternatives in these specific fields of analysis, since each of the sites posed both positive and negative aspects, the study also employed a simple multi-criteria analysis (MCA) in a manner to rank the sites. Based on the engineering economics, a new facility at Waisisi was the preferred option, followed secondly by rehabilitation of Lenakel facility, and then lastly by the development of a new facility at Port Resolution. Application of the MCA process did not alter this ordinal ranking.

527. At present, this AFD study is considered final, yet it remains unclear with respect to any implementation plans of the recommended option at Waisisi. Clearly, this development once again reaffirms the findings of some of the previous studies discussed above with respect to a lack of integrated planning and coordination amongst GoV agencies and stakeholders, and clear channels from moving a project concept forward to implementation.

5.2.9 Current Status and Lessons Learned

528. In summary, although there has been a significant amount of studies on infrastructure and reforms to the legal, policy, and regulatory framework as a means to collectively increase efficiency in Vanuatu's maritime sector, only a small fraction of the recommendations made have actually been implemented in the last 25 years. Currently, aside from this joint ADB-NZAID funded Phase II study, the only other donor driven development activity in Vanuatu's maritime sector is the limited capacity expansion of the international main wharf financed by JICA.

529. At the time of this report writing, very little of the recommendations espoused by the previous policy and planning studies and project design efforts have come to fruition. The national transport asset register established by the 1989 NTDP is not updated effectively, hampering efforts for prioritising new infrastructure investment and maintenance of existing facilities. Due to the lack of maintenance and any new investment, the overall condition index and value of the nation's maritime infrastructure, or capital stock, continues to degrade and depreciate. There remains a lack of coordinated planning and action between PWD and DPH within the MIPU. Following allegations of malfeasance, the once burgeoning VMA has been disbanded and questions remain on the location of its records and status of its assets.

530. A central issue in most of the studies reviewed relates to accurate data availability. The NZAID financed VISSP1 study has to date provided some of the most accurate data on the costs of transport and the shape of the shipping network in terms of vessel size, configuration, ownership etc. Yet, some inter-island shipping data remains questionable and data on costs of transport in terms of land-based cargo consolidation costs, sea-freight, and fare structures continues to be lacking or inconsistently collected and synthesized. Furthermore, data on domestic inter-island cargo and passenger volumes is an estimate at best.

531. As described elsewhere in this report, the status of the maritime sector in Vanuatu is at a critical stage, long overdue for the attention that it deserves given its economic function. Although the strategy is correctly placed at making the most of private sector participation in development and operations, due to conditions of market failure in some cases, as well as simply the nature of some infrastructure types as public goods, the GoV needs to be proactive in reinvigorating the maritime sector and acting upon the recommendations of these previous studies as per their continued relevance today in concert with the conclusions and recommendations which will be forthcoming from this specific Project.

532. It is fully recognized that the previous infrastructure planning and implementation projects, particularly those in the outer islands, have been largely unsuccessful. This can be viewed as the result of one or all of the following three factors:

- Lack of sufficient consultation with local communities and buy-in to the project design and implementation processes;
- Lack of rigorous appraisal of economic development proposals, which to some extent is due to data availability; and
- Lack of consideration to factors key to long term sustainability in the project design.

533. Based on the above previous studies examined, lessons learned that should be heeded in any proposed maritime infrastructure intervention are:

- The siting of wharves, jetties, or landing stages needs careful consultation with the communities who are intended to be the beneficiaries, as a means to ensure adequate utilization.
- Rigorous preparation and appraisal of subprojects is needed given cross-cutting or political issues that may otherwise influence or bias the siting and subsequent analysis.
- Project implementation management and delegation of responsibility for construction supervision needs to be carefully scrutinized to ensure that designs are properly followed and satisfactory materials are used. Given previous experience, particularly with the ADB Multiproject Loan, the adoption of FIDIC principles in the appointment of an "Engineer" should be investigated.
- Infrastructure investment initiatives need accompanying institutional support to facilitate optimal usage, proper O&M, and collection of tariffs for cost recovery.

534. With respect to previous experience observed concerning institutional capacity building and reforms to the legal, regulatory, and policy framework, the following guidance should be followed:

- The value of wide consultation and a participatory process to entrench support and broad ownership for any reform initiative cannot be underestimated to promote a project from concept to implementation.
- There needs to be a commitment to fund institutional strengthening programs of key agencies to ensure alignment of outputs with the intended reform objectives.
- The sequencing of reforms needs to be carefully assessed, with consideration to the sustainability of the reform process, ensuring that it is not too ambitious.

5.3 Scope of Analysis

535. The scope of analysis is the comparison of two alternatives choices: to do nothing (the *Without Project* condition) versus to act, essentially intervening in the current market (the *With Project* condition). The analysis is focused on the potential economic development benefits versus costs of possible subsidized support to the Vanuatu shipping industry and maritime infrastructure interventions. That is, are the future economic benefits of market intervention on the part of international donors and the GoV greater than costs of undertaking the action, i.e., the investment?[32]

536. There are many places on the islands of Vanuatu with no marine infrastructure which are served by inter-island ships via either beaching and putting down a ramp or, more commonly, loitering offshore and lightering cargo and passengers by small boats. Frequently, the ships have to lay off outside the reef and at low tide it is not uncommon for goods to be carried on foot across the reef. Wharves and jetties, if properly sited and designed, allow ships to pull up along side and load or unload cargo more efficiently than lightering.[33] By their nature wharves and jetties are designed to serve a greater number of people, or at least a larger quantity of produce or goods, than a beach landing point and can provide for the aggregation of cargo from several locations to one centralized point. While there is an 'efficiency' gain to be expected from the use of a wharf or jetty there is also the cost of constructing and maintaining it, and the inland transport costs, that could be more or less, dependent upon where the aggregation occurs. The cost effectiveness of a wharf depends on its utilization.[34] Note, the extent that overall transport costs are reduced, additional transportation will be

[32] The actor is not expected to be the private sector entrepreneur because of lack of profitability due to market rigidities or downright failure, or the usual natural characteristics of many types of transport infrastructure as a public good.

[33] For the purpose of making a terminology distinction, jetties will be used to refer to smaller use structures on the outer islands, while wharves will be used to refer to larger, higher use structures and terminal facilities in the urban ports of Port Vila and Luganville.

[34] For example, the cost of the wharf or jetty structure, initially borne by its investor or owner, but passed along through fees to users for cost recovery purposes may make the overall transport costs prohibitive if not used enough, thus making the investment non-financially viable. It is for this reason that the government serves as the

induced. In terms of national or regional economic benefit, additional benefits must be compared with the overall transportation costs such as: practicality, safety, economic, social and political development, capacity increases, and intangible benefits.[35] Intangible benefits, as their name suggests, are those factors are difficult to quantifiable measure in monetary terms yet could be very important to the outcome of the analysis.

537. Since the Second World War with the advent of bow ramped landing craft, which played a key role in ending the conflict there has been a trend where this type of ship has been increasingly used in certain conditions of shipping operations. For instance, in rural locations without adequate port facilities, they are the only solution for bringing in heavy plant or construction materials. They are also very useful at getting into small jetties in poor condition as they can often drop a ramp on to a damaged and otherwise unusable deck. [When beach conditions are right, landing craft can motor right up to the beach, drop its ramp, and discharge cargo and passengers with an efficiency rate similar to that of a conventional ship using a jetty or wharf, but without the costs of providing the infrastructure, something that conventional ships cannot do. Greater efficiency comes at a price, as based on data available, landing craft are generally more expensive to operate in port or at sea than most of the conventional craft in the fleet. Additionally, landing craft are not terribly well suitable for passengers as they often end up being carried on the cargo deck, which quickly becomes awash in any sort of bad weather. Lastly, in situations where the slope of the seabed does not allow landing craft to the shore or when it is exposed to wave swells, it must anchor out or layoff and lighter cargo using smaller boats similar to conventional ships.

538. The merits of these comparative points aside, the analysis presented herein is not a dissertation in the academic debate of the optimal form of inter-island naval architecture and its implications on theories of cargo consolidation versus what has been termed “bus stop” operation. Similar to the composition of the land transport vehicle fleet, it is likely that the optimal composition of Vanuatu’s inter-island shipping fleet is a mix of types. However, what can postulated with some degree of confidence is that without the consolidation of cargo at a small number of designated commercial centres to foster development and facilitate exchange on the outer islands, rural-urban migration will remain unchecked, and economic growth will continue to be muted, growing only as needed based rural population growth rather than at a potentially higher level stemming from the benefits of increased levels of interaction, market access, and information exchange.

539. The analysis is focused on the whether the proposed interventions are feasible against a specified threshold with respect to generating expected national economic development benefits for the people of Vanuatu based on the information and characteristics of the present condition. It should also be noted that despite previous forecasts, conventional ships remain the majority of the present Vanuatu inter-island shipping fleet composition. In any event, economic efficiency based savings to ship operators is only one type of benefit from any of the proposed interventions.

540. While generally employing the same framework, the analysis examines each of the subprojects individually based on its specific conditions and available data. However, it should be acknowledged that as a network, the tonnage handled at the large urban wharves at Luganville and Port Vila will be closely linked to the rate of economic activity both there and in the surrounding outer islands, all else equal.

5.4 Port Vila

541. Port Vila is a key node in Vanuatu’s maritime transport network serving as a trans-shipment point between international and inter-island cargo, a destination for inter-island passengers, and a domestic market for inter-island cargo.

542. As described above, Vanuatu depends heavily on imports for much its consumption. An estimated 80% of all imports are handled through Port Vila. Of annual imports received, an estimated 57% is transhipped to the outer islands. In 2007, total imports amounted to 52,000 tonnes. Based on historic trends and forecasts, 2009 imports are conservatively expected to reach 54,000 tonnes. Therefore, an approximate 43,200 tonnes is expected to be handled at Port Vila’s Main Wharf, of

investor in many cases, essentially treating such infrastructure as a subsidy to users in order to promote economic development, particularly in markets where such works have public good characteristics.

[35] For instance, economic development benefits are not solely due to an overall reduction in transport costs but also generated from greater frequency, increased service capacity, and quality improvements which allow the users to have greater choice in the market.

which an approximate 24,600 tonnes is forecasted to be transhipped to the outer islands through one of Port Vila domestic inter-island shipping facilities. Largely due to the fact that much of Vanuatu's coconut plantations are on Espiritu Santo and Malekula, the processing facilities tend to be located at Luganville. Irrespective of trends in relative value between Vanuatu's agricultural commodities, copra and coconut oil remain the dominant export commodities in terms of tonnage. Approximately 70% of Vanuatu's exports are handled at Port Santo, while the remaining 30% is handled through Port Vila.[36] In 2008, Vanuatu's total exports were estimated to be on the order of 33,650 tonnes, of which some 10,000 tonnes would thus have been expected to be shipped from Port Vila. The number domestic inter-island ship calls to Port Vila that handled that the levels of inbound and outbound tonnage to and from the outer islands was estimated to be approximately 600 in 2008.

543. As stated in the 2008 NZAID VISSP1 Final Report, the domestic inter-island wharf facilities at Port Vila exist at present, but they are in need of rehabilitation and given their condition present a hazardous environment for both cargo and passengers. Furthermore, based on current wharf congestion and tonnage throughput forecasts, there is an urgent need for additional wharf capacity. Nearly the same conclusions were reached by the earlier, but largely forgotten, 2003 ADB Port Vila Inter-island Shipping Wharf Master Plan. In the interim five years between studies, no significant action has been taken to address the deteriorating condition of the existing facilities, nor towards the implementation of a plan to increase inter-island wharf capacity to meet growing demand.

544. In Port Vila, there are three existing domestic inter-island wharf facilities: Dinh Wharf, Star Wharf, and Government Wharf - Marine Quay.

545. Dinh Wharf, previously known as BP Wharf, has three berths, one main berth and two lateral berths, the latter of which cater to small craft due to length restrictions. While there are a number of cargo storage sheds, the area is very congested, has an apron area only of 475m^2, and is deemed to be inadequate for the estimated throughput. There is no room to expand given its location in the centre of Port Vila near the market and surrounding commercial development. During the course of the Project it was learned that wharf has been sold by its owner to a commercial developed and all tenants presenting using the facility have been informed that they vacate the site by December 2010.

546. The Star Wharf complex has one conventional berth face comprised of a suspended deck structure. The facility is located on an area of reclamation, near the main international wharf. Since 2009, further reclamation work has been ongoing enlarging the overall size of the original complex. Recently, there have been various plans to rehabilitate the facility and increase its capacity, including being able to handle containers from international traffic. These plans have been developed by the IFIRA Ports Development and Company Services Ltd, a part of the IFIRA Group, who operates the facility and claims ownership to the site. Landing craft use the Star Wharf being able to simply put their ramp up against the reclaimed land. The suspended deck structure is in extremely poor condition and the 2003 ADB master plan had recommended it be demolished.[37] While not a specific task under the TOR of this project, out of professionalism and interest in public safety, the Project Team's engineer has advised DPH that it should be condemned and no longer be used. Given the state of the maritime sector since the VMA was abolished, whereby institutional responsibility and authority for enforcement of safety standards and regulations is unclear, the wharf will likely continue to be used. However, DPH has advised the owners that there should be significant usage constraints.

547. The Government Wharf - Marine Quay has two berths for potential inter-island use. It is located in the southeast corner of Paray Bay, and as the name would imply is owned and operated by the DPH. The wharf is comprised of a short timber stub jetty. The area has very little cargo handling space either on the wharf or on the adjacent hard stand. Despite its apparent ownership, questions remain about its status given that it used to house the now disbanded VMA and there appears to be movement to lease it out a private sector tuna fish processing company. Upon review of the facility, the Project Team's engineer also made a number of surprising observations that call into question the facility's condition and future. The jetty structure is in very poor condition and is being constantly damaged due to being used by vessels much heavier than what it was designed to berth. Given its structural instability usage restrictions have been drafted for implementation and repairs have been recommended. Furthermore, there is an additional jetty with one berth dedicated to the Defence Patrol vessel, which was not assessed, but it appears to be in poor condition.

[36] Note, the percentage of exports and imports handled at Port Vila and Port Santo have fluctuated over the years.

[37] Although it is not known with accuracy, the existing suspended deck structure may have been built in 1958, but is nonetheless certainly at the end of design life.

548. The assessment of Port Vila's present inter-island wharf facilities is disturbing in the context of the country's economic development. Not only is the economy likely incurring unnecessary economic costs, associated with operational inefficiencies from Port Vila's present poor state in handling current inter-island traffic and tonnage levels, it is also wholly unprepared to meet forecasted future demands. Furthermore, should one of the existing facilities fail, even current demands may not be able to be met.

549. Based on this assessment, only one berth is assumed to be operational over the analysis period in the *Without Project* condition for the economic analysis.

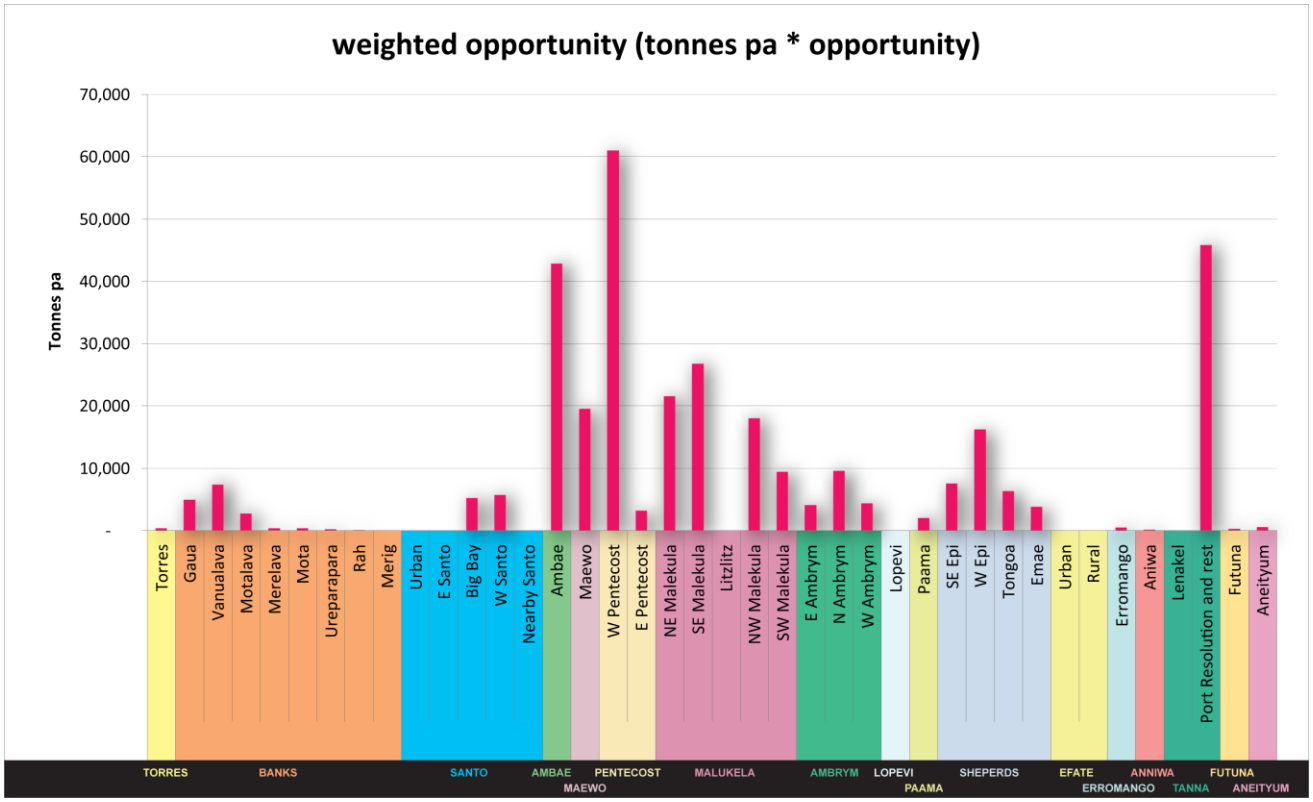
5.5 Outer Island Subproject Identification, Site Selection, and Description

550. As per the above summary of previous studies and projects, the identification of outer island sites for potential maritime infrastructure in Vanuatu has been studied extensively, whereas implementation has been few due to funding constraints, and success of those implemented has been mixed. As a starting point these previous studies served as basis for initial site consideration with emphasis being given to the 1985 JICA Commercial Centre Study, 1989 ADB NTDP, the 2003 ADB OIIDP, and the 2008 AFD Reliable Tanna Infrastructure Study.

551. The 2008 NZAID VISSP1 made significant achievements in the collection, synthesis and analysis of shipping industry data in terms of fleet composition, shipping costs, and cargo shipped. Utilizing this data allowed for the identification of what was termed weighted opportunities for outer island maritime infrastructure based on cargo throughput, i.e., demand for shipping services. Inherently, it assumed that historic cargo throughout was based on levels of economic activity, population, and frequency of shipping services. These factors as well as the others listed below were reviewed in both the subproject short-listing selection process as much as possible, and indeed in the analysis of those subprojects shortlisted:

- Shipping demand (volume of cargo, number of ship calls);
- Population;
- Economic (aligned with national and regional development plans),
- Geography (relative location to other commercial or administrative centres, distance to other modes of transport infrastructure and services nodes, interior versus exterior coast, area accessibility, known tourism activities in the area);
- Environmental issues (known environmental risks);
- Social impact (perceptions of the need for maritime infrastructure or shipping services);
- Marine operations (location relative to existing shipping routes, expected water depth based on charts, relative exposure to cyclone risk, and wind and wave engineer); and
- Engineering (cost effective construct-ability and sustainability in expected conditions).

Figure 5.7: **Jetty Choice Ranking**



552. Based on the extensive review of previous studies and actual implementation experiences, in concert with available data, constraints, and the analysis framework, the following outer island sites were selected for more detailed engineering, economic, social, and environmental assessment.

Table 5.8: **Outer Island Subproject Sites**

Province	Island	Location	Site Historical Status
Penama	Ambae	Lolowai	Existing site, structure destroyed
Penama	Pentecost	Loltong	Existing site, structure destroyed
Malampa	Malekula	Southwest Bay	New potential Greenfield site
Malampa	Malekula	Port Sandwich	Existing site, structure needs rehabilitation
Malampa	Ambrym	Craig Cove	Existing site, structure destroyed
Shefa	Epi	Lamen Bay	Existing site, structure ill-sited, not used
Tafea	Tanna	Waisisi	New potential Greenfield site

5.5.1 Lolowai

553. Lolowai is located on the eastern point of the island of Ambae, essentially forming part of Saratamata, the provincial capital of Penama. The location forms a natural nexus of populations living in the shallow coastal plains stretching back along the southeast and northeast coasts, and had been previously designated as a regional commercial centre.

554. Many vehicles were observed in the area and roads are in good condition. The numerous river crossings around the island on the coastal plains, resultant of the strong flows off the high interior plateau have been selected for upgrading in the ongoing AusAID VTSSP project. The area is serviced by the regional airport at Longana, which is being upgrading by the ongoing the Agence

Française de Développement (AFD) civil aviation upgrade project, which has already sealed the runway and is currently in the process of building a new terminal.

555. Ambae has significant agricultural production according to recent estimates: copra (2200t/yr.), kava (1,000t/yr.), taro (100t/yr.), cocoa (35t/yr.), and vanilla (0.5t/yr.). Much of the coconut plantings appear to be from pre-independence, yet the island with its close proximity to Luganville processing mills remains one of the country's significant production centres accounting for an estimated 6% of the total national yield. The kava and taro are reportedly of high quality and specifically sought for consumption in the Port Vila and Luganville markets by those residents who have made the urban migration. According to the VANRIS database, the island has much unexploited agricultural potential.

556. Lolowai has a fine natural harbour with a draft of 3.4m below the Chart Datum (CD). With its location being in close proximity to Maewo and Pentecost and along the shipping routes from and to Luganville, it has an abundant amount of calls estimated at 250 ship calls per year. At the site there is evidence of at least two previous jetty structures, the older of which appeared to have concrete piles, while the younger had steel piles. Based on information gained from local consultation, the younger facility was constructed prior to independence and had a wooden deck that slowly decayed over time from a lack of maintenance or rehabilitation and conditions.

5.5.2 Loltong

557. Loltong is located in a bay on the western side of the northern end of Pentecost and serves as the island's principle administrative centre. The local community appears to be well organized and is the site of a relatively large grammar school at Latano, located on an old Catholic Mission and coconut plantation. The cluster of villages around Loltong and Latano are surrounded by steep volcanic slopes that rise in a western facing semi-circle around the sides of the bay. Pentecost has a relatively high population density being home to approximately 15% of the population of Vanuatu. Loltong is relatively close to the clusters of villages in both north and central Pentecost on the west coast, as well those on the interior plateau that links to villages in the northeast, however, the main road north-south road that runs along the central plateau is in poor condition resulting in corresponding low levels of traffic. In order for the benefits associated with any project planned for the hinterland to be fully realized the north-south central plateau road condition would have to be improved.[38]

558. Pentecost is the pre-eminent producer of kava in Vanuatu. According to the agricultural census approximately 88% of households in the catchment grow kava, with 15-25% having more than 1,000 plants, which is considered to indicate a marketable surplus over subsistence production. The island as a whole has an estimated annual kava production of 10,000-12,000t/yr., with three-quarters of this total being grown in the central region. Pentecost kava commands a premium price in the Port Vila urban market, with total production estimated to value Vt1,400M/yr., representing approximately 90% of the island's agricultural production by value. Despite the size of the kava crop, its cultivation is a small-scale activity. The other main crop is copra, while other farmed produce include pepper, vanilla, and taro.

559. Loltong is one of the best anchorages around Pentecost with a sheltered beach landing location. From consultations and data collected, Loltong receives 3-5 ship calls per week or approximately 200 per year. Current ship calls are made at two locations: Loltong Bay proper and Latano. Landing craft are known to use Loltong Bay proper, but due to shallowness and lack of slope, even the landing craft cannot make it to the beach. However, this location is the truly sheltered site where yachts are known to anchor. Additionally at this site are the remnants of a 50m earthen causeway that was constructed in 1990 by PWD in order for a barge to land road equipment some years ago. Conventional ships are reported to anchor at the adjacent Latano Catholic Mission site and lighter cargo. At this site are remaining steel piles of a jetty built in 1980 whose deck was completely removed by cyclone Uma in 1987. The jetty was approximately 80-90m long in order to reach 3m water depth. It is questionable whether the jetty was ever used as intended given the existence of shallow reefs seaward from the berth; and as early as 1982 the Posford Report remarked on its lack of strength and stability.

[38] The north-south central plateau road was one of the subprojects planned and approved under the MCC proposal, but dropped when the budget reduction forced the project to focus on only the Efate and South Santo ring roads.

5.5.3 Southwest Bay

560. Due to its size and geographic challenges Malekula is divided into six provincial administrative areas. The southwest area of Malekula is one of the biggest in terms of land mass and an estimated population of 3,200. The provincial Southwest Area Council Centre is located at Wintua, which is also the site of the regional airport. Upgrade of the airstrip was studied both by the 2003 ADB OIIDP and 2005 MCC studies, with both recommending that the project be implemented. Resultant of these previous favourable studies and GoV approval thereof, despite the lack of donor funds, the GoV through the Special Project Committee of the Ministry of Trade and ni-Vanuatu Business Development is proceeding with an enlarged scope of the project with its own funding.[39] The three components of the project now include: (i) upgrade of the airport to an all weather standard, (ii) maintenance of the Lawa-Wintua Airport road, and (iii) construction of a new provincial road from Lawa to Lohkwol. When the project is completed it is expected to stimulate economic activities through greater regional connectivity and access to markets and services.

561. The Southwest Bay area is one of the country's areas with the most agricultural potential through increased land use intensity. The area has one of the most fertile soils for agriculture given the numerous rivers, streams, and runoff from the interior mountains. The area produces copra, cocoa, kava, vanilla, taro, yam, and timber. The area is well known for its marine resources, but the catch remains in the local market due to due to a lack of reliable storage facilities and transport to Port Vila or Luganville. Production intensity of both copra and cocoa is also relatively low, having only some 1,156 and 475 hectares under cultivation, respectively. Kava is an important crop in the Southwest Bay area, with 78% of households reported to be growing it according to the last agricultural census. Only a small proportion of these were growing it on a commercial scale, however, from which one might conclude that there would be scope to expand the industry if there was greater market access and support.

562. As its name suggests Southwest Bay is positioned on the southwest of Malekula. The bay is large and oriented towards the northwest with numerous cliffs near the shore. The southern part of the bay appears to be somewhat sheltered where yachts and ships seek anchorage. Yet, being on the exterior coast it is exposed to wave action, which during the site visit was observable. Ship calls are infrequent, perhaps twice a week, or 100 ship call a year. Without a facility conventional ships when passing on the southwest side of Malekula will sail unless called in via a signal fire. A landing craft usually makes one call per week and can reportedly make it all the way up on the beach. There is no existing storage shed. The 1989 NDTP suggested the potential feasibility of constructing a landing stage in the area.

5.5.4 Port Sandwich

563. Port Sandwich is located in the far southeast corner of Malekula, the second largest island in the archipelago. The existing jetty services the Lamap hinterland with an approximate population of 5,000 in a highly productive agricultural area for copra, cocoa, and kava, which features large copra plantations. The Provincial Government has plans to develop it as a commercial centre and there is an existing airport, the road network is in good condition, and there is a large school.

564. Copra remains the dominant crops produced. Analysis of the VANRIS data suggests that there is considerable potential to increase land use intensity. The area is known to have dense forests and significant timber resources that could be lumbered in a sustainable manner. Additionally depending on the frequency and consistency of ship calls and store facility, fishing is a major activity of the nearby Meskeyline islands which could be served through Port Sandwich.

565. Port Sandwich has been described as the best natural harbour in Vanuatu. Given its high levels of productivity, it has been estimated to have a high number of ships on the order to 3-4 ships calls per week, loading some 100 tonnes of produce, mostly copra, per call. The existing jetty, which is still functioning but in need of major rehabilitation, was constructed in 1970-71. It is located on the south side of the bay and faces west after a bend, an ideally sheltered site, with a reported minimum depth of 2.9m off the berth face. The existing structure is comprised of a 5m wide earth filled causeway with concrete walls, extending 10m from shore terminating in a concrete wall, which serves as the jetty abutment. The jetty constructed of reinforced concrete extends some 19m and is 5m wide. It is remains in reasonable condition considering 30 years of use with minimal maintenance aside from necessary deck repair, and is operational, but presents hazards with missing or loose timber

[39] This is detailed in the February 2009 South West Malekula Rural Infrastructure Development Project report.

decking. Additionally the reinforced concrete substructure has been damaged, likely due to vessel impacts.

5.5.5 Craig Cove

566. Craig Cove is located in the northwest corner of Ambrym island just on the south side of the western point that juts out towards Malakula, which is within sight. Being in an interior slot location in the archipelago, approximately equidistant to both Port Vila and Luganville, Craig Cove receives a high frequency of ship calls making north south voyages between the two urban centres. Consequently, cargo centralisation has been occurring there and the port has a hinterland estimated to extend to a 10 km radius servicing approximately 25% of the island's population. It is the site of island's commercial centre as well as being the Malampa Provincial Government's local area administrative centre. The provincial government has previously stated plans to further develop the centre as a "rural mini-township". Located at the port is the local agricultural cooperative. In addition to the existing cargo shed there used to be a cold store, however, the cooling mechanism no longer functions and questions related to the ownership of the shed itself have decreased the willingness to use the facility at all. Within five minutes walking distance is the regional airport, and the local roads appeared to be in good condition.

567. Likely due to the effects of the volcanic eruption that occurred sometime in the early part of the 20th century, Ambrym is not a highly productive agricultural area relative to other islands in Vanuatu. The island's principle crop is copra producing approximately 3,000 tonne per year, of which some 30% is shipped through Craig Cove. Other agriculture products include watermelons, pineapple, taro, and fish. Additionally, there has been some small scale beef production and timber harvesting, both of which could conceivably be exploited further. According to the VANRIS data on Craig Cove hinterland, however, existing land use maximizes its assessed potential, hence, there is no unused prime agricultural land to be utilised to increase agriculture production even if there was incentive resultant of having greater market access or reduced shipping costs.

568. Craig Cove is a small bay open to the ocean from the southwest to the northwest, and potentially exposed significant swells during cyclones. According to data collected, the port receives at least 6 large ship calls per week or approximately 300 per year, of which some 60% are in the form of landing craft which are able to make it all the way up to the beach for the discharge and loading of cargo. The remains of a jetty are located in the middle of the bay by the storage facility and cooperative. The structure was constructed by PWD in 1978 and consisted of a lava rock filled core covered with reinforced concrete deck and rock masonry sidewalls. According to the 1982 Posford report, the jetty was reported to be in good condition but questions were raised about its usefulness as related to its length and whether there was sufficient water depth for vessels to berth. The structure was destroy in 1987 by Cyclone Uma which swept away two-thirds of the causeway, sucked out the lava rock fill, and pushed the jetty head towards the shore. Additionally, it should be noted that a large vessel was beached during a storm some years ago and remains there today reportedly leaking petroleum.

5.5.6 Lamen Bay

569. The island of Epi is located between Efate and Santo, at the crux of the 'Y' shape that characterizes Vanuatu archipelago. Located between the two main urban trading centres, it is well served by inter-island shipping as they ply their trade in north-south routes. The commercial centre of the island is Lamen Bay on the northwest coast near the northern point of the island surrounded by the main population concentrations, who reside along the northeast and northwest coastlines. Within close proximity to the commercial centre is the regional airport, hospital, agricultural cooperative, and a high school. Roads were observed to be in good condition and a PWD road maintenance machinery depot was observed.

570. The island is known as a supplier of kava, peanuts, taro, and other fruit and vegetables to the urban markets of Port Vila and Luganville. There is surplus arable land and labour, so improved market access would be expected to stimulate increased agricultural production. The principle exports are kava (250t/yr.), peanuts (100t/yr.), taro (20t/yr.), and fruits and root vegetables (300t/yr.) with an estimated total value of these crops being about Vt100M per year. Much of the agricultural production takes place on the east side of the island, which is exposed, lined with reefs, and has no safe anchorages.

571. The bay is approximately 1200m long by 800m wide, and being somewhat indented on the interior western coast, offers some shelter for anchored shipping. Conservative estimates based on local consultations and the NZAID VISSP1 report suggest there are 6 or more ship calls per week, or approximately 300 per year. Additionally, Lamen Bay is a popular tourist destination being a popular anchorage for P&O Cruise Ships three to ten times a year and smaller yachts approximately 300 times a year, both of which make a substantial contribution to the local economy.

572. A causeway of mass concrete on top of rubble filled bags was constructed in 1988 as part of the ADB Multiproject. It was built upon an existing reef and extends approximately 75m from the shore and is 4m wide. A berthing structure was constructed at the head consisting of reinforced concrete piles supporting caissons. Despite a lack of maintenance, the structure is in relatively fair condition after 20 years and surviving numerous cyclones, however, it is in a damaged state. Unfortunately the structure is rarely used by vessels due to a lack of sufficient water depth and risks of several coral heads in the approach area. The specific location for this structure changed three times when it was constructed. During the site visit, local members of the community showed the Project Team where the structure was reportedly suppose to have been originally located a few hundred meters around the bay to the south with access to sufficient water depth.

5.5.7 Waisisi

573. Waisisi anchorage is located approximately midway along the northeast coast of Tanna Island. Tanna is the main island in five island southern most Province of Tafea with an estimated 2009 population of some 33,000, or 14% of the nation's total.[40] While the demand of Tanna's population, in addition to those required for catering to its significant tourism, receives regular ship calls, albeit perhaps not wholly sufficient in frequency, the other four remote provincial islands of Aneityum, Futuna, Erromango, and Aniwa having small populations and significant additional distances from Tanna and each other, receive less than four ship calls a year and are the focus of the shipping support scheme.

574. Located on the southwest side of Tanna is Lenakel, which has a significant population and serves as the commercial centre. It is situated next to Isangel the provincial capital and administrative centre. Lenakel is also the site of the Tanna's only port and is in close proximity to the island's airport, which is being upgraded by the AFD civil aviation project. Roads around Lenakel and Isangel are in fair condition, however, the main road transecting the island providing access to the north coast where Port Resolution, Wasisi, and the volcano of Mt. Yasur, which is the island's primary tourist attraction is in poor condition and will be rehabilitated under the ongoing AusAID VTSSP. The southern circumferential coastal road is in even worse condition, and there are no roads in the north where much of the island's agricultural potential is located.

575. Tanna is an agriculturally productive island, with its principal goods being copra, kava, and coffee. Starting the mid to late 1980s, Vanuatu's coffee production started increasing after a long decline. The turnaround was grounded in Tanna, whose name is now synonymous with the high quality coffee that Vanuatu has become known for. Tanna coffee is grown only in the north of the island, where transport services are lacking. There is a coffee processing plant at Lenakel, where it along with the other agricultural goods are exported to Port Vila. Tanna, particularly pockets around Waisisi, has significant agricultural potential yet to be tapped.

576. The other significant economic activity is tourism with an estimated 5,000 visitors per year, with the principle draw being the active Mt. Yasur Volcano.[41] At present tourists usually fly into the airport near Lenakel, use land transport to cross Tanna, and usually lodge on the north side of the island where the resorts are located near the volcano with an average stay of 2-3 days. With other such average lengths of stay, other tours and activities around the volcano continue to develop.

577. Based on information collected ships calls at Lenakel are approximately 2-3 times a week or 150 ship calls a year. Consultations have suggested that there are problems in getting ships to make calls at the northeast side of the island at either Port Resolution or Waisisi on a regular basis, thus populations at these places must make the trek across the island to Lenakel for access to shipping services. Built in 1988, resultant of the 1985 JICA commercial centre study, the structure was severely

[40] A recent provincial health survey estimated the population was significantly higher around 38,000; which if accurate, suggests that there very well could be a general underestimation of rural populations based on projected growth rates and the 1999 census.
[41] Tanna is a distant third rank amongst the islands in tourism arrivals behind Efate and Santo.

damaged by a cyclone in 1994. It was rehabilitated in 1999, but given its open exposed position to the southwest ocean, questions remain about its long term sustainability and thus reliability for servicing Tanna, and thus the other four provincial outer islands.[42] Other sites have previously been investigated. The 1989 NTDP noted that Port Resolution was an inlet with a natural sheltered location near Mt. Yasur, but with insufficient water depth would require dredging and be prone to sedimentation. The Waisisi anchorage was noted for its fine deep sheltered harbour, which is occasionally used by inter-island ships when seas at Lenakel are too rough, and was proposed as a development project. The recently completed AFD study on Tanna Port reliability arrived at the conclusion that development of a facility at Waisisi as compared with Port Resolution and rehabilitation of Lenakel offered the best sustainable solution as a means to minimize facility failure and other development risks.

5.6 Analysis Framework: Model Description, Assumptions, and Parameters

5.6.1 Model Description

578. The economic assessment of the proposed subprojects has been done in accordance with the standard application of the *With* versus *Without Project* framework and makes use of the best available data as a basis for defining and valuing costs and benefits. In many cases hard data is scarce or simply unavailable, partly because of weaknesses in the country's statistical base and partly because of the nature of benefits envisaged, however, the analysis benefited greatly from having the 2008 NZAID VISSP1 data at its disposal.

579. In terms of methodology, two similar model approaches have been employed, one for the urban wharf at Port Vila and one for the potential outer island jetties. The Port Vila urban wharf model follows the typical port approach employing queuing theory for berth waiting time and is thus focused on ship operations savings. Whereas the outer island approach taken herein closely follows the 2003 ADB OIIDP study, which was similarly adopted by the 2005 MCC Infrastructure Upgrading and Development Program. Where possible, particularly with use of data from the 2008 NZAID VISSP1 and newly collected data, revisions and improvements have been made, although the analysis framework remains essentially the same. For instance, annual estimates of inbound and outbound cargo have been estimated based on the data collected from the 2008 NZAID VISSP1, ratio of populations in the proposed subproject hinterland or catchment area, and the estimated rural population growth, i.e. anticipated demand and supply for cargo over the project life cycle, all else equal. Furthermore, based on the site visits and consultations, the model's framework has been fine tuned to the specific conditions of the site, for instance, in the distribution between productive crops and potential for increased land use intensity.

580. Benefits are estimated based on consumer or producer surplus such as reduced transport costs, reduced cargo losses, and value of time saved. Additionally, benefits have been assessed on the basis of a proposed subproject's economic development impact such as induced agricultural production. Costs of wharf construction have been estimated based on the engineering design and realized costs for similar recently constructed structures in the Pacific. The economic costs of the project have been assessed by removing duties and other taxes on imported materials, and on construction, operations, and maintenance activities from the financial costs. All benefits and costs are in the domestic currency, Vatu, and are in 2009 constant prices.

581. With respect to the estimation of benefits, a significant amount of judgement had to be applied in concert with local consultations and data availability. A process of parameter and benefit verification via a form data triangulation using other references and studies was employed to minimize uncertainty and refine parameters and estimates. In general, a conservative approach in benefit estimation has been undertaken. For instance, given the lack of data, benefits attributable to increased transport safety has not been estimated, but rather simply assumed to be a qualitative benefit. Nor have any induced macroeconomic growth benefits been estimated associated with a more efficient shipping network.

582. On the cost side of the equation, the Project Team is highly confident that the proposed subprojects can be achieved within their estimated costs having purposely been liberal in the

[42] There are even questions on its existing functionality given wave action while ships are at berth.

approach taken with regard to unit costs and quantities, that is, where there was uncertainty, the higher unit cost or quantity has been used.

5.6.2 Assumptions and Parameters

583. The Project Team has consulted with shipping operators, shipping service users, provincial government staff, members of the DPH, and have visited all the proposed subproject locations in order to ascertain the specific realities of the sites regarding current shipping services, perceptions thereof and related and social issues, engineering considerations and risks, and environmental conditions and risks. As such, and in addition to the data compiled in the 2008 NZAID VISSP1, there is a degree of confidence that the estimates made are based on reasonable assumptions and parameters given the time and data limitations and likely conservative in nature.

584. In reducing the costs to existing transport users or suppliers, a surplus is generated that can be shared by either service suppliers or providers, the distribution depending on market conditions. To estimate the value of ship time saved by the construction of wharves and jetties, local ship operators have been consulted to ascertain the economic costs of running the vessels. Two representative ships have been modelled, one representative of conventional vessels while the other representative of bow ramped vessels:

- Conventional inter-island ship of 40-80 DWT, with a cargo and passenger payload capacity from 40-80 DWT and 25-60 1 way pax;
- Bow-ramped interisland landing craft of 100-120 DWT, with a cargo and passenger payload capacity from 100-120 DWT and 100-120 1 way pax.

585. Typically vessels sail in general north-south directions along the inner and exterior coasts of the main islands of Espiritu Santo, Malakula, Ambae, Penetcost, Ambrym, Epi in routes out of the two major ports of Luganville to Port Vila, either making circular voyages back to their departure port, or arriving in the other major port before returning back to its origin. Vessels are known to make frequent stops on these routes either at known centres or when signalled by residents on the shore.

586. Ships calls are not predictable. Local community residents have an idea of the various ship schedules and are starting to have an ability to contact vessels with the spreading of mobile phone technology, but the exact time of its arrival at any given point in the circuit is dependent on wind, seas, and the number and duration of earlier calls made while en route. In some places, particularly those along the exterior of the islands, if a vessel's carrying capacity is reached, it will turnaround, head back to its departure port, and not make any further calls. Without a secure storage facility, shipping services users must either plan ahead and be prepared to wait for the vessel to arrive or risk missing the vessel if they delay in hauling their cargo to the loading point once the ship call is certain.

587. When making the ship call in the outer islands, there are two scenarios in the *Without Project* condition contingent upon the type of vessel:

- A conventional ship, will loiter or anchor offshore and lighter goods to and from the ship. Shipping service users who bring their produce to the ship call location will usually assist the crew in loading and unloading the vessel's boats, but usually must pay for the lightering of their goods. In some cases, depending on the location and type of cargo, a third party may also provide boats for lightering services, which must be paid. The loading rate by such means is variable dependent on the local conditions, and hence the average length of such ship calls.[43] It is assumed that the loading rate in the *With Project* condition, with a wharf, is twice as fast as compared to the *Without Project* condition.
- A bow ramped landing craft, also makes multiple calls and, where possible, land on the beach or come as close as possible to the beach. From consultations with communities at potential outer island sites it was evident that in some cases even the landing craft were not able to come all the way into the beach and must load and unload cargo in various depths of water, slowing the process and risking damage to cargo. Hence, it is assumed that the loading rate in the *With Project* condition, with a landing stage or ramp, is marginally faster as compared to the *Without Project* condition.

[43] Most ship calls involve only 3 to 5 tonnes of cargo, which is about 2 to 3 lighter boat trips.

588. In the *With Project* condition, the economic benefit in reduced transport costs accruing to shipping services operators from a wharf is computed as being equal to the average annual number of ship calls to a specific location multiplied by the estimated time savings per call multiplied by the estimated average hourly ship in port cost. This is computed for both landing craft type vessels and conventional vessels based on location specific distribution derived from available data and observation.

589. Regardless of the vessel type, the ship's captain will typically pay the pay the consumers of the shipping services for the agricultural products loaded based on a standard beach price. However, based on observations and apparently contingent upon the commodity, particularly commodities other than copra, many cargo owners informed that they must travel to the central markets of Luganville or Port Vila with their product in order to sell their produce.[44] In doing so, they not only sometimes pay for the fare for the voyage both ways, but also must expend significant amounts of time away from their family and community. This is the "total economic price" they pay for not having a local middleman or wholesaler for their product.

590. Based on consultations, there was ample evidence of routine loss of both inbound and outbound cargo due to theft or damage, the latter mainly due to water damage either in the process of lightering, loading and unloading landing craft not fully beached, or simply from a lack of cover from the rain. Therefore, similar to the 2003 ADB OIIDP study, it has been assumed that in the *Without Project* condition 1% of cargo value is damaged.

591. Given the issues with ship call timing and potential loss of cargo, it is assumed that the construction of a secure storage facility is an integral part of the proposed subprojects in the *With Project* condition, necessary for the achievement of the envisaged benefits reduced cargo loss and value of time saved. The specific design of some form of middlemen, wholesaler, or cooperative intervention, i.e., trading channel is beyond the scope of this project. However, given observations made in addition to the provincial priorities contained in the regional economic development plan, further detailed analysis and design of such an intervention to reduce market inefficiencies or indeed failure is warranted.

592. The populations served and land area in the hinterland or catchment areas of the proposed subprojects have been adopted from the 2003 ADB OIIDP project's profiles of the same sites. Population values have been updated.

593. With reduced transport costs, better access to markets, and other associated agricultural market support programs, it is assumed that land use intensity will increase. The Vanuatu Resource Information System (VANRIS) data for the subproject hinterlands was utilized for presenting an assessment of current land and quality of land for various purposes. Based on site specific information, it was assumed that a percentage of unused prime agricultural land became utilized resultant of the subproject.[45] Agricultural products planted in this new area for cultivation were based on existing crop patterns rather than which crop resulted in most net value added.

594. Unit net value added for induced agricultural products was computed as:

	Market value
Less	Transport cost to market
	Farm-gate value
Less	Actual / implied land rent
Less	Cost of material inputs
	Gross value added
Less	Cost of labour inputs
	Net value added

[44] In particular, this seemed to be the case with kava.

[45] Note, only a percentage of unused prime agricultural land category was used as an attempt to be highly conservative. In most cases this amounted to less than 50 hectares.

595. All proposed subprojects were engineering designed based on a 50 year life. All proposed subprojects are assumed to have an economic life of 30 years before any necessary major rehabilitation is required. No residual value to the structure is assumed.[46]

596. Although, a lack of maintenance to previously existing structures is one key reason for their failure and no form of maintenance program is currently evident, annual maintenance costs of 1% of initial capital expenditure are assumed.

597. A Standard Conversion Factor (SCF) of 0.87 has been applied to nontrade components of the financial costs. This SCF calculation is based the value of exports, imports, and associated duties for the period of 1998 to 2008, and is consistent with previous estimates.

598. A real discount rate of 10% has been assumed.

599. Inland transport costs have been assumed based on values obtained at the specific subproject locations. These costs are based on the distance in the facility's hinterland and the type of cargo transport to the proposed jetty site, i.e., consolidation point. As indicated in elsewhere and as illustrated in *Table 5.5*, the shortlisted sites for evaluation are generally not new Greenfield sites, but rather established consolidation points and associated hinterlands. That is, producers in these hinterlands are already bringing their produce to the proposed site and the establishment of new infrastructure at these sites is generally not assumed to be diverting traffic from other sites such as beach locations where no infrastructure exists, as per the "bus stop" theory. [47]

5.7 New Project Appraisal

600. A summary of results from application of the general model to the specific site conditions is presented in Table 5.6.[48] A discussion of the model's application and associated results to each site is presented below with specific emphasis on highlights, caveats, and implications for implementation. However, first a few general points should be made concerning the model's application:

- It is expected that the engineering costs are highly conservative, that is, perhaps higher than actually will be realised should implementation proceed. This statement is based on recent similar projects and associated civil works in the Pacific. Nonetheless, the Project Team favoured a conservative approach to cost estimation for the following reasons: (i) it set a higher threshold for projects to clear in assessment and thus served as a filter to arrive at those few projects with the highest potential for success, hopefully avoiding past mistakes; and (ii) a standard engineering design was employed, and thus there is uncertainty concerning the actual application to a site, so high contingencies were used to counter uncertainty in what may actually be encountered.[49]
- In general, realization of the benefits of the project, particularly those of reducing transport costs, depend on its use over its design life and thus are a function of a number of items some intangible or beyond the scope of the Project, while relying on greater GoV active participation, namely as follows: (i) there needs to be coordination between other GoV complementary projects and programs such as agricultural extension services, micro-credit finance facilities, and the like to increase rural productivity and demand for transport; (ii) there needs to be better more efficient, and if need be, directed, coordination between transport users, the proposed storage facilities, and middlemen or wholesalers; and (iii) greater attention to regulation and the performance of the shipping industry will result in the demands of the users being better met.[50]

[46] However, it is assumed that the GoV on some level will be the owner of the infrastructure throughout its design. No provision has been made for the GoV to lease the infrastructure for a fee.
[47] In the case of Waisisi, one of the two Greenfield sites, cargo that would go to Wasisi would be diverted from Lenakel, but rather than an additional inland transport cost, this would represent a benefit in the form of transport savings given the expected hinterland and reduced travel distance.
[48] Detailed benefit and cost streams are presented in Appendix 5.1.
[49] During detailed engineering design and implementation the design will be altered, perhaps to a higher standard and cost for potential high priority subprojects if required, or where savings are found to a lower cost on other subprojects. However, the maintenance costs estimated as 1% of capital expenditure are still likely overestimated especially in comparison to the current expenditures on infrastructure maintenance and budget forecasts.
[50] It is envisaged that the shipping coordinator program will support point (ii).

- The induced agricultural development benefits are likely understated. The country's natural resources are significant and yet poorly utilised due to the agricultural sector's structural inefficiencies. Thus, only a small percentage of this potential has been estimated to be stimulated through more efficient transport services. Most agricultural production at present is subsistence based, and this is solely how the benefits have been assessed, whereas with better market access, the benefits from a more cash based economy would also be expected, such as greater employment opportunities, but calculation of these types of benefits has not been attempted.
- As described above, the standard outer island subproject engineering design and associated costs was established based on trying to cater to both types of vessels in the current Vanuatu domestic fleet: landing craft and conventional ships. Thus, the standard design involved both a landing craft ramp and a jetty. Given that by far the majority of vessels in the fleet are of conventional ships versus landing craft, and that the latter are arguably able to reach the beach without any infrastructure, to further the analysis the outer island subprojects are also evaluated without the landing craft ramps.[51] In this analysis, the estimated costs of the landing craft ramp and benefits have been omitted.

Table 5.9: **Summary of Project Appraisal**

Subproject	Province	Island	Capital Cost 2009 Prices		Economic Performance		EIRR Sensitivity Tests	
			VtM	US$M	EIRR	ENPV (Vt'000s)	Capital Costs +10%	Total Benefits -10%
Port Vila Inter-island Wharf	Shefa	Efate	812.40	8.12	29.5%	1,783.9	27.3%	27.0%
Waisisi	Tafea	Tanna	181.78	1.82	17.2%	127.39	15.7%	14.0%
Jetty only			131.90	1.32	23.2%	177.01	21.2%	19.1%
Lolowai	Penama	Ambae	181.78	1.82	14.0%	79.08	12.9%	11.6%
Jetty only			131.90	1.32	17.0%	106.7	15.7%	14.2%
Port Sandwich	Malampa	Malekula	181.78	1.82	14.1%	75.29	12.8%	11.5%
Jetty only			131.90	1.32	18.3%	117.89	16.8%	15.1%
Loltong	Penama	Pentecost	181.78	1.82	12.9%	48.15	11.7%	10.3%
Jetty only			131.90	1.32	16.0%	101.37	14.6%	13.1%
Latano @ Loltong	Penama	Pentecost	243.91	2.44	8.3%	-35.06		
Jetty only			194.03	1.94	9.6%	-7.08		
Lamen Bay Jetty	Shefa	Epi	181.78	1.82	9.0%	-15.67		
Jetty only			131.90	1.32	11.4%	16.57	10.3%	9.2%
Craig Cove Jetty	Malampa	Ambrym	181.78	1.82	6.8%	-46.96		
Jetty only			131.90	1.32	8.4%	-18.28		
Southwest Bay	Malampa	Malekula	181.78	1.82	6.2%	-57.01		
Jetty only			131.90	1.32	7.4%	-30.01		

5.7.1 Port Vila

601. As advised by previous studies and this project's current assessment, the maritime infrastructure situation has reached a critical point in Port Vila. In Vanuatu, the movement of cargo and people via the shipping links between islands is analogous to a land based country's interstate highway or rail system. As the capital, the primary urban centre, and the source of economic growth via the services sector and tourism, it is a vital hub of national economic activity and a key transhipment node with the outer islands.

[51] It remains uncertain of how often landing craft can actually reach the beach and unload cargo and passengers without lightering. Obviously, this depends on the location and characteristics of the specific location.

602. Outbound cargo tonnage to the outer islands in the form of the remainder of imports to Port Vila, but not consumed by Port Vila have been estimated based on the historic trend given GDP, the Vatu exchange rate, population, and data pertaining to the relative distribution of tonnage shipped between locations in Vanuatu. Inbound cargo tonnage from the outer islands in the form of outer island Vanuatu products namely: kava, timber, coffee, root crops, fruits, and vegetables, have also been estimated. Collectively, these form the estimated inter-island cargo tonnage throughput of Port Vila. Ship calls to Port Vila have been estimated conservatively given recent data, acknowledging the excess of shipping capacity, and projected population based demands.

603. The proposed wharf facility in *With Project* condition of three conventional vessel berths and two landing craft ramps has been designed in order to cater to such expected cargo throughput demands, projected ship calls, and shipping industry operational standards as well as specific Vanuatu conditions. It has been assumed in the *Without Project* condition that as of 2011, only one conventional ship berth and one landing craft ramp will be in operation to satisfy the projected Port Vila facility demands. This is deemed to be highly charitable, given that if safety, engineering standards, and other operational regulations were imposed more rigorously, the actual wharf capacity of Port Vila in the *Without Project* condition would be less, essentially zero.

604. The stream of net economic benefits have been calculated as the difference in project conditions focusing on the efficiency based cost savings from shorter ship waiting and service times given projections of ship calls, tonnage throughput, and a shipping model based on queuing theory and shipping industry standards. Based on this approach an EIRR of approximately 29% was estimated.

605. No attempt was made to calculate net incremental benefits stemming from the project. More specifically, it could be assumed that in the deteriorating *Without Project* condition, it is highly likely that the remaining structure would fail, or more conservatively that simply the remaining facilities would be unable to cope with the projected higher demands for cargo throughput eventually resulting in the ceiling on the tonnage that could be handled in any given *Without Project* condition year. With a capped tonnage throughout in the *Without Project* condition, the estimated project tonnage throughput in the *With Project* condition could be qualified as net incremental benefits. The issue with making such an estimate is at what level does one impose the tonnage ceiling? Additionally, it is not just the loss of that difference in the estimated value of tonnage throughput not realized, but also the multiplier effect of that value lost in terms of net income earned to Ni-Vanuatu that would be expended on other purchases shrinking the economy and stifling growth.

606. As discussed above elsewhere, in recent years from 2005 to 2008, GDP has been realising annual percent changes on the order of 5% to 8% per annum, being largely due to Port Vila based tourism growth. However, 1997-2007 average annual GDP growth has only averaged 2.2%, likely being correlated with rural population growth. Should the proposed investment in the new facility not be realised, it is likely that it is those rural populations on the outer islands who would be most effected, furthering the rural-urban economic divide and potential for inequity related issues to arise. Along this line of thinking, it would be realistic to assume that rural economic growth would be seriously hindered, thus an estimated net economic loss of 1%-2% of GDP would not be unreasonable. Given that many may shift their shipping routes to increase services to and from Port Santo, especially those in the more northern islands, a conservative measure could be 1% loss of GDP to the nation. Based on the 2007 estimate of GDP to be Vt51.9 billion, this would amount to conservative loss of Vt519 million per year until the solution is resolved as compared with a one time Vt812 million capital expenditure investment.

5.7.2 Outer Island Subprojects

607. The Waisisi subproject on Tanna is assessed to be highly feasible based on the economic evaluation. Tanna's population is estimated to be approximately 15% of the total national population, which is predominately served by the Lenakel facility on the southwest exposed side of the island. The model presumes the implementation of a facility at Waisisi to serve a current hinterland population of 6,200 persons in substitute of crossing the island to Lenakel.[52] While some agricultural and shipping benefits are estimated, the majority of benefits are accrued from travel cost and time

[52] This is only a small fraction of the estimated 13,100 by the 2008 NZAID VISS Phase I study that would be served by an alternative facility at Port Resolution, and Waisisi is a better location closer to the cross island road and closer to northeast communities. Port Resolution offers a nicely sheltered site but likely has insufficient depth, suffers from sedimentation, and would require dredging.

savings of those who would no longer have to travel to Lenakel for shipping services.[53] The resorts and local population catering to the tourism industry reside on the northeast side of the island, which does not at present receive regular ship calls unless the weather is too rough at Lenakel in which case ships anchor at Waisisi. Under present *Without Project* conditions, businesses and residents must make monthly cross island visits to Lenakel to purchase supplies for their enterprise or household, or in the exchange of their produce for shipment to Port Vila that can involve up to Vt10,000 for one shipment of goods. Furthermore, those who reside on the sparsely populated Erromango Island, which at present get very few ship calls, and on Aniwa, which is only 30km from Waisisi, would likely benefit from a facility at Waisisi, although the access benefits have not been estimated in the assessment of Waisisi. Given the predominance of ship calls to Tanna is currently in the form of conventional ships, the reduction in Waisisi subproject scope of the landing craft ramp results in a higher EIRR and ENPV given that the marginal benefits of the shipping gains from having the landing craft are less the marginal costs of constructing the landing craft ramp. Should the Project proceed, inclusive of the proposed infrastructure intervention at Waisisi, the subproject should not include a landing craft ramp.

608. Lolowai was assessed to be an economically feasible investment. Located in a sheltered cove on the easternmost point of Ambae, the port area is located in close proximity to the local administrative, provincial government, and commercial centres, and serves both part of the north and south coasts, having an estimated 2008 hinterland population of approximately 4,300 persons. The port receives a significant number of ship calls from vessels enroute to both Port Santo and Port Vila, before or after crossing the slot to Pentecost, picking up the area's significant weekly agricultural production, but suffers from inefficiencies in loading and unloading cargo.[54] While some ship savings and inland travel cost savings are realized the majority of benefits are in induced agricultural production. Similar to other outer island sites assessed, the proposed location at Lolowai is already an established cargo centralization point. This is especially the case for those residents on the southern side of the island. The proposed project, inclusive of the storage shed, will be highly complementary to the ongoing AusAID VTSSP of which one subproject is the upgrading of the circumferential coastal road.[55] Although it was safety was specifically mentioned as an issue with present operations during the consultation process at the site, no benefits stemming from increased safety of passengers in the loading or unloading was quantified. Although it is estimated that the number of ship calls to Lolowai are equivalent in terms of landing craft versus conventional ships, the removal of the landing craft ramp from the subproject design increases the EIRR and ENPV. Given conditions at Lolowai, it is possible that landing craft can use the beach, thus a landing craft ramp is likely not essential to the gains from the other proposed infrastructure civil works.

609. Port Sandwich has an existing 30 year old facility that enjoys a high rate of use due to its excellent sheltered anchorage and productive hinterland, however, the present condition of the facility risks failure and is dangerous to users. Some ship operators have suggested that the facility at Port Sandwich is on the wrong side of the harbour, however, the road connections on the north side of the harbour are lacking. Additionally, the greater density of population is the southern side in the Lamap vicinity. As an established cargo consolidation centre and good interior road network, Port Sandwich has a relatively extensive hinterland presently estimated at 5,350 persons. The residual life of the jetty facility are limited and the costs associated its unexpected loss due to due to failure would be significant given the levels of agricultural activity in the area. The main purposes of the project are to preclude a structural collapse and to provide a new facility that will allow more efficient cargo handling, and improved storage to allow crop production and transportation to the site to proceed independently of the timing of ship calls. Assessed benefits include reduced cargo losses, savings in ship operations time, reduced travel costs from agricultural producers, and induced agricultural production. The provincial government has indicated plans to make the site a commercial centre. It is likely that the implemented engineering solution at this site could be less than the conservative figure estimated for the analysis. As discussed Port Sandwich has an existing jetty, of which some 80% of the ship calls are conventional ships. The elimination of the landing craft ramp in the subproject scope has little impact on the estimated economic benefits while significantly reducing the costs,

[53] It is assumed that most coffee production will still be shipped to Lenakel where there is a processing facility, but this could change if the Lenakel facility fails again as it in 1994 when a cyclone rendered it inoperable for five years.

[54] Ambae produces some 6% of the nation's copra production,

[55] It is likely that the realized hinterland will be much greater than estimated due this land transport improvement and particularly the lack of ship calls on the south side of the island.

thereby increasing the EIRR and ENPV. Should the Project proceed, the rehabilitation of the civil works at Port Sandwich should be without the addition of a landing craft ramp.

610. There are two potential sites at Loltong, one is the location of the old Catholic Mission and previous jetty, more specifically referred to as Latano, as compared with a more sheltered yacht anchorage in Loltong proper. The local government in Loltong is very proactive and have developed zoning and land use plans to direct efforts and foster economic growth of the resident communities. They have proposed the Latano site as the location of a replacement jetty. This site was evaluated, as a representative outer island site, but unfortunately due the necessary length to reach sufficient water depth and associated engineering economic costs, that being approximately 34% higher than the standard representative design, the Latano site is not feasible. However, should a typical representative structure be able to be constructed in Loltong proper, then that subproject site is assessed as feasible. Based on consultations with the local community and data collected, while there would be some benefits to ship operations and induced agricultural production, the majority of benefits result from reductions in travel costs depending on the location of the local farmers and reduced damage to cargo. Loltong offers one of the best ship call locations on northwest Pentecost, and the 2008 NZAID VISP Phase I study evaluated this area as being conducive to cargo consolidation given cargo throughput and the fact that there are some locations (25%) unsuitable for landing craft style beach landing on western Pentecost. At either the Loltong proper or Latano sites, the majority of ship calls are in the form of landing craft. The removal of the landing craft ramp at either proposed subproject reduces the respective subproject costs and benefits, however, it does not significantly change the results with respective economic feasibility, particularly at Latano where it is the jetty that comprises the significant expense. Should the Project proceed, a facility should be built at Loltong proper, while the idea of building a long jetty at Latano should be abandoned.[56]

611. Lamen Bay is an existing commercial centre with a high frequency of ship calls and generally serves as a cargo consolidation point for the island of Epi, although its hinterland population is only estimated to number 2,350 persons. It is also known as a tourist attraction for passing cruise ships and an anchorage for yachts. As discussed above, it has an existing jetty facility wrongly sited, which consequently is not used as intended. Benefits have been estimated resulting in a more or less equal distribution amongst: ship operation savings, limited induced agricultural production, user travel cost savings, cargo loss reduction, and induced tourism, however, the subproject is assessed not to be feasible. An alternative site for a representative structure has been located, but quite simply the costs outweigh the benefits. Should this overall Project be implemented, the concept for this subproject may warrant being re-visited if a lower design engineering design cost can be estimated with greater confidence, including an analysis of possible rehabilitation of the existing facility and design augmentation to make it function as originally planned, if possible. It should be noted that during the public consultation, the question of rehabilitating the existing structure was raised in lieu of constructing a new structure. In any case, should civil works be constructed at Lamen Bay, it is questionable as to whether a landing craft ramp is necessary. This should be further assessed in concert with any proposed detailed engineering design of the specific subproject site.

612. Craig Cove was estimated to have a hinterland population of approximately 3,050 persons, approximately 25% of the population on Ambrym. Based on data collected, it is also a commercial centre for Ambrym receiving a high number of ship calls of some 300 per year reflecting the cargo consolidation that takes place there. However, the island is not deemed to have any further agricultural potential and the majority of its ship calls are in the form of landing craft who can make it all the way up on the beach most of the time. The location with its close proximity to Port Vila is also known for its supply of fish. Based on the model, the subproject is not deemed to be feasible whether with or without a landing craft ramp. The benefits, especially minimal ship operations savings given the estimated distribution of vessels making ship calls and the landing crafts' ability to fully exploit the beach, are simply not great enough to overcome the economic costs of the representative project structure. Should the overall project move forward, perhaps a simpler designed landing stage and cold store could be investigated.

613. Southwest Bay with its location on the western exterior coast of Malekula immediately raised some engineering concerns. The area's hinterland population was estimated at 2,730 persons. The area possesses significant agricultural potential from increased land use intensity and a

[56] Given the percentage of landing craft calling at the Loltong-Latano location and questions remaining over their ability to reach the beach, the merits of developing a more detailed cost effective design apart from the standard design should be investigated further.

complementary airport upgrade and interior road construction project is ongoing. Currently, the area only receives about 200 ship calls per year with an estimated majority being landing craft, which are able to make it all the way up on beach. Based on the representative subproject cost, the current level of economic activity in the area cannot justify the benefits for a representative subproject, with or without a landing craft ramp at this time. Should the overall project move forward, perhaps a storage shed should be investigated to reap the benefits of reduced user travel cost, reduced cargo loss, and to facilitate economies of scale from greater cargo consolidation which are already taking place at the site.

614. Based on the model employed, the analysis demonstrates that in the Outer Islands the efficiency gains from ship operations savings are only one component of the overall economic development impact or benefits from the proposed subprojects. Given the fact that the majority of vessels in the domestic fleet remain of conventional ships, compounded by the uncertainty over the efficiency gains of landing crafts' need to use ramps given that at times they can reach the beach, it appears that the marginal costs of including landing craft ramps in the standard subproject design outweighs the marginal benefits of their inclusion. To examine this further, the costs and benefits of including the landing craft ramps in the standard subproject design were factored out and analysed. The results are presented below in *Table 5.10*.

615. Thus, as per the analysis framework for the subprojects assessed, the addition of landing craft ramps should not be included with the jetties, as their contribution to EIRR is marginal at best and the ENPV of their additional cost is actually negative. This is likely due to the fact that: (i) shipping operations efficiency gains are only one estimated benefit stream from having an established passenger and cargo consolidation centre, (ii) landing craft are deemed more efficient than conventional ships and efficiency gains from a ramp are marginal, especially in some circumstances where they can reach the beach, and (iii) the majority of vessels in the domestic fleet remain of the conventional ship type.

616. Should the project proceed, given the marginal nature of both Loltong and Lamen Bay, perhaps a more detailed analysis is necessary to develop a different cost effective engineering design for these specific sites given vessel type, depth conditions, and other operational factors.

Table 5.10: **Analysis of Landing Craft Ramp Inclusion in Outer Island Subprojects**

Subproject	Province	Island	Economic Performance	
			EIRR	ENPV (Vt'000s)
Waisisi	Tafea	Tanna	Negative	-49.61
Lolowai	Penama	Ambae	2.47%	-26.32
Port Sandwich	Malampa	Malekula	Negative	-42.60
Loltong	Penama	Pentecost	2.34%	-27.98
Lamen Bay	Shefa	Epi	0.70%	-32.18
Craig Cove	Malampa	Ambrym	2.08%	-28.68
Southwest Bay	Malampa	Malekula	2.62%	-27.18

5.8 Identified Potential Reinstatement and Major Rehabilitation Works

617. This section assesses the potential merit of reinstating the two outer island wharves at Lenakel on Tanna and Litz Litz on Malekula and the publicly owned Simonsen wharf in Luganville. These facilities are of varying age and condition, with the latter being due to a combination of factors such as: usage, original construction quality, environmental conditions, and any previous or ongoing maintenance or major rehabilitation activities carried out.

5.8.1 Lenakel and Litz Litz

618. As discussed elsewhere in the report, there are two existing large concrete outer island wharves that were originally constructed in the 1988-1989 period resultant of a 1985 JICA feasibility study and subsequent grant funding for implementation. These structures are significantly different in design and cost than the design of those new potential outer island jetties proposed as a result of this current study. For instance, the Lenakel and Litz Litz wharves were built based on a 50 year design life.

619. Based on their location, the frequency of use of these two facilities differs as does any environmentally associated risk. Litz Litz located on the interior east cost of Malekula is in a relatively sheltered position, while the Lenakel wharf located on the southern coast of Tanna is exposed to the open sea and at significant risk of damage from cyclones. Indeed, although it was built to withstand the 1 in 30 year cyclone event, only a few years after construction in 1994, the Lenakel facility was so severely damaged by a cyclone that it required major rehabilitation in 1998 in order for the facility to be used once again. Whether this cyclone was of a 1 in 30 year event or greater intensity is uncertain.

620. Neither the Lenakel nor Litz Litz facilities appear to receive any regular maintenance. For purposes of the analysis, it is assumed that this lack of regular maintenance has reduced the original design life of the facilities. Without having any specific data available, for simplicity it is assumed that for every year of deferred maintenance the design life of the facilities is reduced by one-half a year, thus in the extreme should neither facility ever receive any maintenance, the design life is reduced to 37.5 years.

621. The analysis herein for these two facilities is framed at reinstating the facilities or recovering the value of the asset through various identified repairs to rectify the lack of regular annual maintenance up to the present. With adequate maintenance, it is assumed that the structures would otherwise exhibit a straight line depreciation of 2% per year over the 50 year design life resulting in a residual value of zero at the end of the design life. The lack of maintenance is assumed to imply an increased depreciation rate of the asset. The proposed design amendment of the additional construction of landing craft ramps at the two facilities is also discussed below.

622. Without the design amendment of the landing craft ramp, the economic costs of reinstating the Litz Litz wharf to its original economic design life cycle has been estimated to be Vt16.34 million. This results in an EIRR of 224% and ENPV of Vt367.4 million. Clearly based on this simple analysis and assumptions, these remedial repairs should be carried out.

623. The question of whether a design amendment of adding a landing craft ramp is difficult to assess given that it was not an original component of the project contributing to its estimated value for reinstatement. The rationale given for building a ramp is that landing craft vessels improperly using the wharf head itself have likely caused additional damage than would otherwise be incurred through its designed conventional ship use. Furthermore, the apparent current use of the causeway by landing craft is contributing to the erosion of loose coral material close to the access road. One may question whether this is simply a regulatory matter to prevent the landing craft from the wharf or causeway and establishing a dedicated location for them to come ashore.

624. Without the design amendment of the landing craft ramp, the economic costs of reinstating the Lenakel wharf to its original economic design life cycle has been estimated to be Vt19.7 million. This results in an EIRR of 64% and ENPV of Vt142.6 million. Once again, clearly based on this simple analysis and assumptions, these remedial repairs should be carried out. The difference between the Litz Litz and Lenakel results is largely due to the fact that Lenakel was recently rehabilitated in 1998 yet nonetheless requires more costly repairs than Litz Litz.

625. The question of whether a design amendment of adding a landing craft ramp is once again difficult to assess given that it was not an original component of the project contributing to its estimated value for reinstatement, nor was it deemed necessary as a component of its major rehabilitation that was implemented in 1998. In contrast to Litz Litz where landing craft are frequently making use of the facility, there are much fewer ship calls by landing craft at Lenakel. Furthermore, at Lenakel, the rationale for the inclusion of a landing craft ramp is that these vessels current use of a nearby beach is dangerous due to the approach given the rocks and currents. Unlike Litz Litz, apparently landing craft do not use Lenakel, whether this is due to regulation or some other reason is not known with certainty. Although, it is acknowledged that the present use of a nearby beach for landing craft is hazardous, as with the other outer island jetty assessments undertaken, without better

data on accidents, the benefits from increased safety are difficult to quantify. Additionally, given the cyclone risks associated with the Lenakel location and orientation, as well as the possible implementation of a recommended facility at Wasisi, there ought to be some consideration as to whether any additional new investment at Lenakel should proceed, as per the metaphorical argument known as "chasing good money after bad."

626. It should be also noted that given the original design and implementation funding of the Litz Litz and Lenakel facilities through a JICA grant, the GoV is eligible to apply to JICA for further grant funding for their respective reinstatement. The MIPU has been advised of this, however, at the time of drafting this report it is unclear as to whether the GoV has taken any action in this regard for either Litz Litz or Lenakel. Should the GoV want to proceed in amending the design of the facilities, this should be discussed with JICA in concert with a more extensive analysis involving an asset management system approach that can assess the probability of facility failure due to cyclone risk, damage assessment from various vessel uses, and optimal timing of major rehabilitation versus recurrent maintenance expenditures.

5.8.2 Simonsen Wharf

627. As described in Chapter 2, the publicly owned facility in Luganville, the Simonsen Wharf, is in need of major rehabilitation. Similar to Port Vila, the facilities in Luganville play a key role in the Vanuatu economy. The domestic inter-island facilities such as Green's Landing, Simonsen, and Melcoffee all serve as a transhipment point for agricultural exports.

628. The Simonsen facility currently has a five conventional ship berth capacity, a magnitude commensurate with that of Port Vila. Berth capacity is relatively low given the availability of the other existing privately held facilities in Luganville. Indeed, based on demand forecasts no new berths are deemed required in Luganville. While Melcoffee and Green's Landing offer additional capacity in Luganville, the loss of the Simonsen facility would impact upon waiting times and in general decrease the competitive environment.

629. The proposed wharf facility in *With Project* condition of major rehabilitation in 2014 of the wharf face and landing craft ramp has been recommended in order to cater to preclude any loss of berth capacity and cargo handling efficiency given expected cargo throughput demands, projected ship calls, and shipping industry operational standards as well as specific Vanuatu conditions. It has been assumed in the *Without Project* condition that as of 2015, berthing capacity of the facility will decrease resulting in increased waiting time of vessels and reduced cargo handling rates.

630. The stream of net economic benefits have been calculated as the difference in project conditions focusing on the efficiency based cost savings from shorter ship waiting and service times given projections of ship calls, tonnage throughput, and a shipping model based on queuing theory and shipping industry standards. The project's economic cost is estimated at Vt367 million and a 1% annual O&M cost has been assumed over the 30 year design life. Based on this approach an EIRR of approximately 15% was estimated.

5.9 Shipping Services Support Scheme

631. A key component of the Phase 2 effort as per the TOR was the directive to design a scheme to support domestic inter-island shipping services for isolated communities on routes that are presently deemed not to be commercially viable. This follows directly from the recommendations made in the NZAID Phase 1 Final Report which were:

- The use of a subsidy to contract an existing shipping services provider to make a scheduled deviation in current routes or a new independent voyage to the identified isolated rural communities; and
- Management of the rural community demands, shipping services contracting, and overall coordination of the effort by the GoV via a proposed shipping coordinator.

632. The specific design of both the shipping services support scheme and the role of the shipping coordinator is discussed in Chapter 1, however, it should be reiterated here that these two project components are high complementary. Indeed, one may go further and suggest that the shipping services support scheme could not be effectively implemented without the shipping coordinator. Along this line of reasoning, in the economic assessment of the shipping services support scheme, the costs estimated for implementing the shipping coordinator have been included in the analysis.

633. In general, international aid donors such as the ADB and NZAID recognize that subsidies usually create market distortions, and therefore restrict funding of subsidies to well defined conditions. For instance, the ADB Criteria for Subsidies (IN.226-96, 30 October 1996) specify various conditions under which subsidies are justifiable. These include:

- Situations of positive externalities, where social returns from a project exceed private returns. This criterion clearly applies in this case, although it should be demonstrated, as far as possible through quantified economic appraisal in the form of the economic gains to the nation outweighing the amount of funding given to private sector shipping service providers.
- Decreasing cost sectors where individual producers need to be subsidized to attain the socially optimal levels of output. This criterion likely also applies in consideration that the shipping support services act as a catalyst resulting in greater service predictability, which in turn drives greater rural output and demand for shipping services that eventually lead to commercial viability on the route once a demand threshold is met.
- The presence of other distortions, or the effects of other government interventions, which may have to be offset through subsidies.
- Redistribution, where subsidies are targeted at reducing poverty. This criterion clearly applies.
- Special considerations that may require subsidies, such as in the context of transitional economies, where there may be no or weakly developed market institutions.

634. In the case of Vanuatu, where the people living in small isolated communities on remote outer islands tend to be poor and disadvantaged lacking access to alternative livelihood opportunities and competitive markets, the first, second, and fourth criterion clearly apply. By both promoting economic growth and extending its benefits to those who are currently excluded by accidents of geography combined with poor services, the shipping services support concept aims at promoting inclusive growth, that is, more opportunities for greater numbers of the population to share in the gains from economic growth.

635. An important output from VISSP1 was the analysis of the shipping services currently being provided to various locations around the country in terms of ship call frequency, estimated levels of inbound and outbound cargo, shipping operator cost structures, and the fares charged on various routes. Given the lack of existing readily available data this was no small feat and was a necessary step laying the foundation for the current analysis to be undertaken.

636. In VISSP1 study, the minimum frequency threshold for an acceptable level of shipping services was set at a ship call once every three months, this being primarily based on the maximum amount of time that harvested copra remains viable for further processing.[57] At this minimum level, or equivalent to four ship calls a year, areas not receiving this threshold level of service were selected as potential candidates for this shipping services support services.

637. Over the course of the last year, particularly more recently close to the time of this report, some changes in the provision of shipping services have been observed. The list of islands or areas needing support services and their approximate 2009 populations is given below:

- Tafea Province: Futuna (510), Aniwa (540), and Aneityum (1645); and
- Malampa Province: West Santo (3,300) and Big Bay (4,050).

638. The reasoning for the shipping services support scheme and the shipping coordinator is due to market rigidities or failure. In places such as those five identified, there isn't enough demand for shipping in terms of cargo or passengers to stimulate a shipping operator to make a ship call on a more frequent basis due to the shipping services cost structure versus what the users would be willing or able to pay. Essentially, calls to these places cannot generate the minimum load factor to result in

[57] If one thinks about the role of the inter-island shipping to the outer islands as a vehicle offering market access, three months is likely near the maximum amount of time that people can live with whilst still remaining a part of the economy through trade, communications, and movements. Obviously, more frequent ship calls would be preferable to induce greater cohesion and interaction.

a profitable voyage. Given that ship calls are highly infrequent, the residents of these places are not induced to produce commodities beyond their own subsistence consumption since the extra labour of effort to do so fails to bring a surplus given the lack of regular access to markets.

639. The changing nature of the shipping services in concert with the role of the shipping services support scheme and the shipping coordinator should be remarked upon. The shipping services support scheme component of the project is initially envisaged to be a temporary intervention in the domestic inter-island shipping market, for a duration of 18 months over 2010-2011 and involve a minimum of six voyages to the five identified areas. Based on performance, need, and feedback, it is expected that a future assessment will then be made about the value of the services and whether it should continue, potentially being expanded based on demand, or remain the same, or should the initial process be fully successful, then it can cease as planned and allow the private sector to function on its own. The role of the shipping coordinator is also of this nature and much of its future will depend on performance and the other proposed institutional changes in the MIPU. As discussed above concerning the full realization of benefits associated with the outer island infrastructure interventions, it is envisaged that the storage facility and development of wholesalers or middle men will be important in cargo consolidation and utilization of the facilities over time. As such, it would be an extremely positive development if the shipping coordinator's role expanded in these areas and working with other agency programs such as the cooperatives, agricultural extension services, and rural development. In this sense, both components are somewhat of a pilot program whose future is contingent on performance.

640. For lack of better data, based on distance, initial cargo and passenger levels, and ship operating costs, it has been initially assumed that a 50% voyage subsidy will be required. Furthermore, it has been assumed that once the shipping services support scheme has been initiated and residents are informed of the next voyages, demand for the ship calls will increase allowing for a reduction in the subsidy. Again, for lack of better information a simple linear reduction in the subsidy level has been assumed for the six trips to the five areas over the initial 18 month period arriving at an estimated total cost of Vt3.33 million over two years.

641. The costs of the shipping coordinator program has been estimated based on a bottom-up accounting approach of establishing a network of local coordinators across provinces and properly equipping them. This has been estimated as an initial establishment cost of Vt12.85 million in year one, and an operations cost of Vt7.34 million every year thereafter.

642. It is assumed that ships operators willing to engage in a contract under the shipping services support scheme will at a minimum break even on the voyage and that following the initial incentive of the shipping services support scheme will continue to make the same number of voyages to the specific locations as the subsidy reduces. That is, revenues from the higher levels of cargo and passengers will more than cover the reduction in the subsidies.

643. In the *Without Project* condition, inbound and outbound cargo levels are assumed to remain constant with the present condition at best, however, further modifications have been made where specific projected data has allowed for adjustment, particularly in the case of West Santo and Big Bay where questions have been raised about the future levels of service without any support mechanism. These areas have historically had low numbers of ship calls but high copra productivity. It is not implausible to consider that without the proposed shipping services support scheme the copra trade in some of these places may collapse altogether.

644. In the *With Project* condition, inbound cargo is assumed to grow at a minimal level to keep pace with the projected rural population growth, while outbound cargo has been projected to grow based on historic levels, ship calls, and an induced growth factor attributable to the relative increase in the number of ship calls per specific location. A consumer surplus of 10% has been assumed on the incremental inbound tonnage reflecting that a consumer's willingness to pay for these imports is greater than the price paid.

645. Data on passenger demand is not available. It is assumed that with greater frequency of ship calls, more passenger trips will be made to visit relatives, access markets for entrepreneurial activities, or simply for children to go to school. Furthermore, it is assumed that the value of the voyage made to the consumer is greater than the price of the fare, but no attempt has been made to measure this surplus.

646. Based on the cost estimates and projected benefits of the shipping services support scheme operating in 2010-2011 and the shipping coordinator scheme operating from 2010-2015, the estimated EIRR of the program is 35.6% and an economic net present value of Vt6.7 million.

5.10 Recommendations for Proposed Project

647. As stated earlier in the section on the methodology and scope of analysis, an effort has been made to evaluate the various project components or subprojects on their own merit individually as best as possible given specific site information and data availability. Yet in Vanuatu, the shipping services and support infrastructure form a transport network of nodes and links to facilitate trade, economic development, and indeed social cohesion as a nation. The subprojects and components of the project evaluated on individual basis form parts of this network with key functions to support its effectiveness and efficiency in the transport of goods and people. As such, their combined value is likely much greater than their individual value alone. In particular of the project subprojects and components evaluated, this is most likely the case with Port Vila, the shipping coordinator and the shipping services support. Even in the case of the outer island jetty subprojects, given the process of site selection these chosen few are those which tend to serve a relatively high volume of the rural population and are strategically located.

648. The subprojects and components deemed feasible are:

- Port Vila Urban Wharf,
- Waisisi Rural Jetty,
- Lolowai Rural Jetty,
- Port Sandwich Rural Jetty,
- Loltong Rural Jetty,
- Reinstatement of the Litz Litz and Lenakel facilities,
- Major rehabilitation of the Simonsen Wharf in Luganville,
- Shipping Services Support Scheme, and
- Shipping Coordinator Scheme.

649. The projected economic benefits and estimated economic costs totalled to assess the project as a whole, strictly being the sum of its parts, results in an EIRR of 19% and economic net present value of Vt2,042 million. Based on the overall estimated benefits, costs, composition of the project from the selected subprojects the project appears to be robust with a recalculated EIRR of 16.4% should the costs realized be 20% higher than anticipated, or a remaining EIRR of 15.5% should 20% of the projected benefits fail to be realized.

650. As listed individually above, some of the subprojects have higher estimated EIRRs than others. Should the final composition of the project change whereby some subprojects with lower EIRRs are removed, then logically the overall project EIRR would be expected to increase, all else equal.

651. As stated previously, given the cost estimation process, it is highly unlikely that the project would experience a cost overrun, rather there could be some form of cost savings in individual subprojects or across the project as whole. This being the case the EIRR could be expected to be higher.

652. Should the project proceed, it is recommended that the individual subproject sites, particularly those on the outer islands be reviewed with respect to the engineering design and associated costs given a more detailed analysis of the site conditions and requirements.

653. A key aspect of this project is the shipping coordinator. It is highly recommended that this role become a permanent function of the MIPU or at least for an extended period of time, wherein the role is enlarged to not only assist in the shipping services support scheme, but to facilitate the use of the proposed storage facilities at the outer island sites, work with other agencies to promote rural productivity, and assist in the development of local market access through a cooperative, wholesaler, or similar service to facilitate the exchange of goods in the outer islands rather than in Luganville or Port Vila.

6. Legal Requirements

This chapter examines the current maritime legal framework with the idea of bringing it up to date and into harmony with maritime industry development within the region and also improving the safety and economic performance of domestic shipping in particular.

The salient features and main issues of the Vanuatu maritime industry and its legal framework are that:

- **the present legal framework has been inherited from the colonial era – with few improvements since;**
- **the scope and level of detail in some Acts are more suited to regulations or rules;**
- **Vanuatu is a signatory to at least 46 international maritime law instruments – only 19 seem to be appropriately written into Vanuatu law;**
- **Vanuatu's present maritime legal framework consists of at least 26 Acts that prescribe various requirements on the sea transport system and its participants: 18 relate to economic requirements and the markets that comprise the maritime industry while 16 relate to safety requirements;**
- **the main Acts relevant to the sea transport system are Chapter 131, the Maritime Act (to cater for what is sometimes referred to as "big ships"); Chapter 53, the Shipping Act (for the "little ships"); Chapter 26, the Ports Act; and Chapter 38, the Maritime Zones Act; and, Chapter 155 the Maritime (Conventions) Act;**
- **these requirements provide for flag and port state control (to some extent), the safety oversight of ports (to a lesser extent) and oversight of the sea lanes and waterways (to some extent);**
- **the Maritime Act in 1981 (essentially providing for an international shipping register) together with the Vanuatu Maritime Authority Act of 1998, have dominated the Vanuatu shipping industry - together these tended to blur the responsibility between the economic and safety requirements of the industry and to distance the government from some of its responsibilities;**
- **the success of the Vanuatu international shipping register largely rests on Vanuatu maintaining its 'white list' status with the International Maritime Organization (IMO);**
- **marine pollution, the marine environment, oil spills and conservation requirements are unattended within the current legal framework;**
- **the repeal in 2007 of the Vanuatu Maritime Authority Act 1999 resulted in some confusion for the administration of the main Acts; and today**

- **the principal safety concerns for domestic shipping are: overloading ships and not monitoring ship stability, inadequate competency of ships' senior personnel for the operations involved and the unsafe condition of some domestic wharves.**

It is recommended that:

1. the legal framework separate the economic requirements from the safety and security requirement; [s 6.10]

2. that Vanuatu's maritime law be consolidated into three (Bills) Acts: [s 6.10]

(i) a Sea Transportation (Bill) Act to provide for the transport (economic) requirements of Vanuatu's sea transport system incorporating provisions for the establishment of ports, economic regulation, marine pollution and environmental protection and expanding on existing economic provisions scattered throughout the present Acts; [s 6.11]

(ii) a Maritime Safety (Bill) Act to provide for the safety and security requirements of Vanuatu's sea transport system and for the adoption of the life cycle approach to safety regulation; [s 6.12] and

(iii) a Ship Registration (Bill) Act to provide for the registration of ships in Vanuatu and the establishment of two shipping registers: an international one and a domestic register. [s 6.13]

3. the Sea Transportation (Bill) Act be drafted first because it provides for the establishment of a Maritime Fund that is referred to in the Maritime Safety (Bill) Act and that the Maritime Safety (Bill) Act be drafted in parallel or in close proximity; [Appendix 6.2 and Appendix 6.3]

4. technical and legal assistance be sought to assist in the drafting of the new (Bills) Acts; [Appendix 6.3 – s1.24, and, Appendix 6.4 – s1.2] and that up to 12 man months may be required at an estimated cost of Vt35.0 million. [Table 8.20 & Table 8.21, Chapter 8]

654. One of the tasks of the Project is to: review the institutional requirements of government agencies responsible for domestic shipping; streamline and improve policy development, legislation, planning, administration and management; and, improve the safety and economic requirements and performance of domestic shipping.

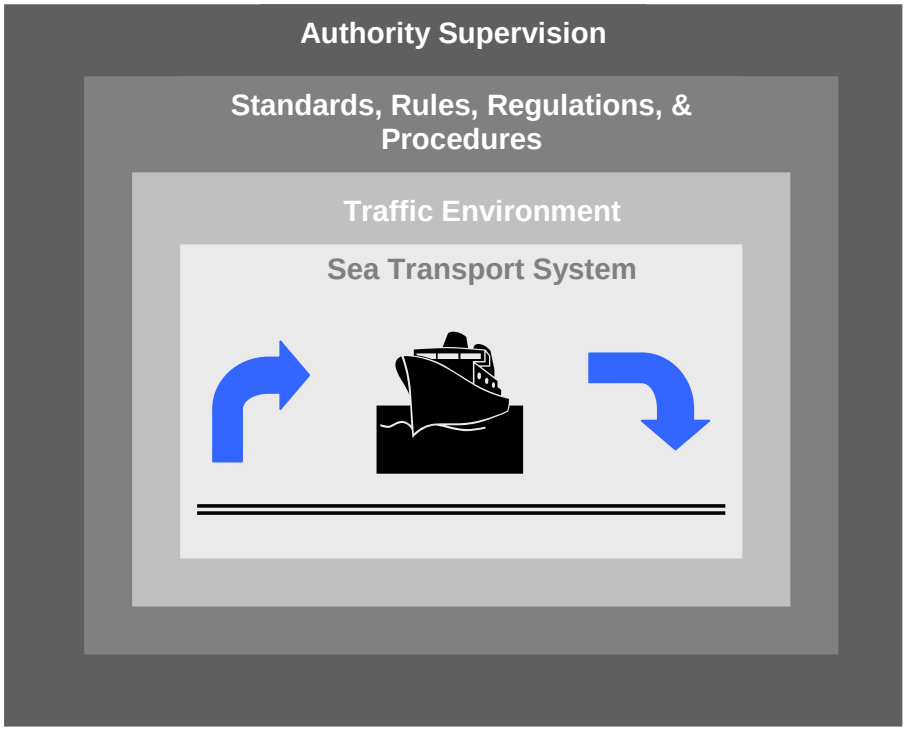
655. In order to do this a suitable framework for analysis is needed to understand the various requirements of the sea transport system and its interrelationships with the various components that make up the system; in particular, those components that carry out the work and contribute to the economic, social and political development of Vanuatu. Accordingly, the legislative requirements are considered first as these requirements must support the overall objectives of the system, the sea transport system. In turn the institutional arrangements to improve policy development, planning, administration and management will be considered in Chapter 7.

6.1 Maritime System

656. The maritime system is one of many systems that exist within the economic, social and political fabric of a country. Like other systems it is a complex unit with many different parts; it is controlled by the same plan or purpose: it is not a contest. The maritime system is no exception.

657. The primary purpose of the maritime system is to transport cargo and people from one place to another by either public, private or commercial means. The functions necessary to carry out this primary task constitute the sea transport system, which is focused on passengers and cargo. Passengers and cargo are the very reasons for the system's existence. *Figure 6.1* illustrates the components of a maritime system.

Figure 6.1: **Maritime System**



658. Apart from the carriage of passengers and cargo, ships are also engaged in fishing, cable-laying, oil exploration, hydrography and a variety of other marine work as well as being used for recreational activities by ships of various types and sizes. These ships use the same ports, harbours, sea lanes and water ways as passenger and cargo ships. So, for the purposes of an analytical framework marine work and recreational activities, etc are included in the sea transport system (See also footnote 61 in section 6.3.

659. The sea transport system works in a *traffic environment* comprising of other modes such as road, rail and air.[58] The various traffic environments are governed by *operating standards, particular rules and procedures*. In turn government authorities supervise the various traffic environments as well as the standards, rules regulations and procedures to ensure that they are both respected and appropriate to the objectives of the overall system.

6.2 Sea Transport System

660. Because of the sea transport system's complexity it is necessary to be able to look at it against some sort of analytical framework in order to be able to recognise and determine the system's legal requirements and the role and functions its component parts play. VISSP1 describes such a framework for analysis.[59] It is repeated here because it is fundamental to understanding the proposed legal framework and the institutional arrangements required to support the maritime and sea transport systems.

[58] For example airspace near an aerodrome may overlap with the airspace surrounding a seaport with its cranes and ships; access to a sea port is by road and sometimes rail and rules and procedures are needed to maintain appropriate separation.

[59] NZAID & Ministry of Infrastructure & Public Utilities: Vanuatu Inter-island Shipping Study (Phase I) Final Report 27th June 2008

6.2.1 Framework for Analysis

661. The transport system is a generic concept as in practice there are three specific transport systems:

- land transport system,
- sea transport system, and
- air transport system.

These three systems operate in different environments.

662. The sea transport system operates in a particular environment with a level of complexity, technology, operational parts and connections that sets it apart from the land transport system and air transport system. However, it can be argued that they are controlled by a similar 'game plan' and that their primary objective is similar.

663. The sea transport system[60] comprises three functional or operating subsystems that altogether perform the transport work; they are interdependent:

i) a *vessel operations subsystem* (viz. ships, boats, etc);

ii) *a sea port subsystem* or nodes (viz. seaports, terminals, jetties, wharves, channels etc), plus

iii) a *sea and water subsystem* or links facilitating navigation (viz. seas, oceans, rivers, and canals, navigation aids, etc).

664. The sea port subsystem is the point of entry and exit of passengers and cargo into and out of the sea transport system. This is effectively the only part of a particular modal transport system where contact with other modes occurs. Although from time-to-time the links or operating medium between modes can result in competing claims for the same resource, *e.g.* where a seaport and airport are in close proximity, airspace claims can be contentious, or where a bridge crosses a harbour or river.

665. It is evident that these three subsystems depend on each other and so should operate in a cooperative rather than in a contestable way. Unfortunately, this does not always occur, especially where private sector or commercial interests become involved. In this regard ownership is a key influence on how these subsystems operate and relate to each other, *i.e.* competitively or cooperatively.

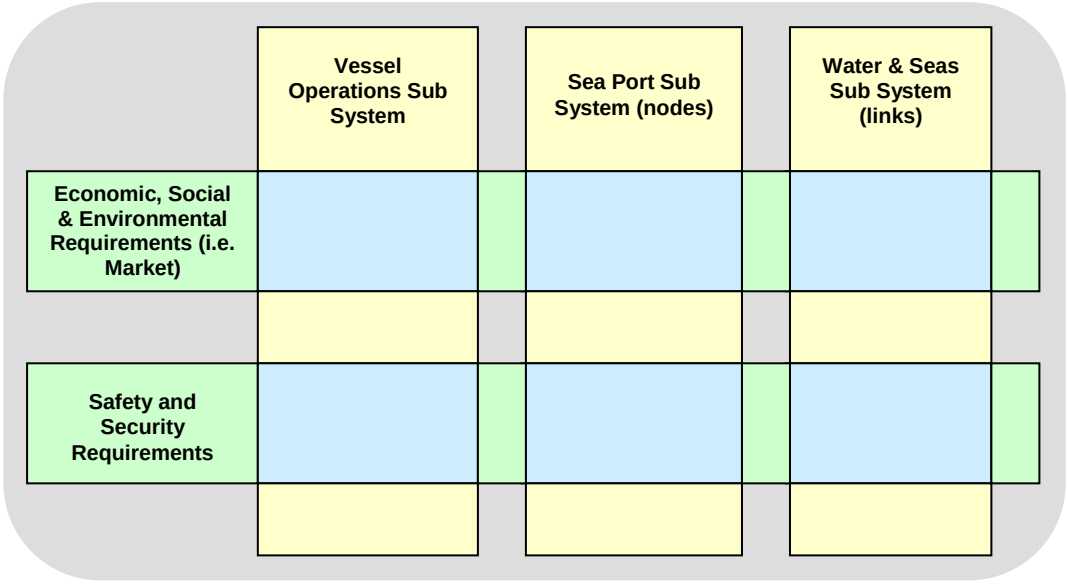
666. The functions and performance of these three subsystems are affected and governed by two sets of regulatory requirements:

- *Economic or transport requirements*: which are simply referred to as the "economic requirements" (ER) but they include and are not necessarily limited to *social*, *environmental* and *political* requirements; they concern supply and demand matters such as: the allocation of traffic rights, fares, rates and tariffs, taxes and levies, transport subsidies, pollution control, economic and social development issues, curfews, allocation of resources, *etc*.
- *Safety and security requirements*: which are referred to as simply "safety requirements" (SR) but they are to do with appropriate levels of safety and security within the transport systems; these requirements relate to both people and property.

667. The relationships between the subsystems and regulatory requirements are illustrated in *Figure 6.2*.

[60] As does the two other modal systems, air and land.

Figure 6.2: **The Sea Transport System**



668. The economic requirements are essentially to do with satisfying the demand for transport. Satisfying this demand usually involves trade-offs or compromises between various interests to meet specific or general economic, social, environmental and political outcomes. For example, transport has a dual relationship with trade and tourism. On the one hand transport serves trade and tourism; but, on the other hand transport can foster trade or tourism. This is known as the duality principle in transport.

669. The safety requirements are designed to achieve a certain level of safety and security. These requirements involve meeting minimum standards and mostly involve technical and operational matters – rarely are trade-offs involved or permitted but it makes all round sense to stop seeking improvements to these standards when the marginal expenditure is equal to or greater than the marginal benefit, otherwise resources are wasted. Furthermore, the security requirements can involve strict demarcation lines between the subsystems for example dividing the landside of a seaport from the seaside or quayside.

670. Governments set economic and safety policies and requirements. And, it is very important to differentiate between these two requirements. This is because safety and security requirements must meet minimum standards whereas there may be a variety of compromises and "trade-offs" in formulating economic requirements. In any event, such compromises and "trade-offs" will not involve safety standards. While the objectives of these two quite different requirements are themselves quite different, both are necessary to achieve the overall transport objective, that is, they are different sides of the same coin.

671. In all countries the government sector has historically had a huge involvement in the transport sector as an owner and operator as well as a regulator. For some parts of the transport system the government's involvement has been and still is huge, for good reason. However, the last two decades have seen a retrenchment of government participation within transport systems. This has been a feature in most developed economies and has been promoted in many developing countries. The wisdom of this shift in ownership from the public to the private sector has been furiously debated. Supporters of privatisation point to the improvements in shipping, seaports and airports, while critics point to failures in developed countries (e.g. the UK and New Zealand rail systems, the increasing monopoly power of privately owned seaports and airports and the many failed airlines that are back in government ownership). The critics contend that governments have eagerly sold off the more profitable and monopolistic services and facilities simply to pay off debt and are stuck with those (usually essential) facilities and services for which a private sector operator could not be trusted or the services and facilities are an (international treaty) obligation rather than filling a market need. Safety and security can fall into that category.

672. The ownership of the various components of a transport system has an influence on transport performance.

673. The vessel operations subsystem is generally owned and operated by private enterprises and sometimes State-owned enterprises or government departments. By and large, ships, boats, ferries, barges, *etc* tend to be owned by the private sector. This is the case in Vanuatu. The vessel operations subsystem is the object of a number of international maritime conventions, for example: International Convention for the Safety of Lives at Sea (SOLAS) 1974, Convention on the International Regulations for Preventing Collisions at Sea 1972, International Convention on Load Lines (LL) 1966 and the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) 1978.

674. The seaport subsystem is operated by government, local government or community, or by private enterprise. Because many seaports, wharves, jetties, channels, etc create a geographic monopoly, require special land rights or involve huge investment at the outset they are often government or local government owned unless a private investor is assured of a financial return. Today many seaports remain in government or local government ownership and control. But they have in recent years become targets for investors who see them as safe and low risk investments. Private wharves and jetties are generally part of some larger commercial or industrial undertaking such as an oil refinery, mineral enterprise (e.g. coal, aluminium, iron ore), etc. The seaports subsystem is also the object of international maritime conventions, in particular the International Ship and Port Security (ISPS) Code under SOLAS.

675. The waters and seas subsystem or links can involve sovereignty issues and for this reason is, in most countries, a government (State) responsibility. This is the case in Vanuatu. Significantly this subsystem is the object of a number of international treaties concerning sea resources, pollution, etc such as the United Nations Convention on the Law of the Sea, The International Convention for the Prevention of Pollution from Ships (MARPOL) 1973/78.

676. It is evident that the sea transport system serves two transport requirements: a domestic requirement and an international one. It is also evident that the sea transport system is the subject of a number of international conventions and treaties.

677. These three subsystems effectively comprise the 'sea transport industry'. The following paragraphs examine the Vanuatu sea transport system in more detail and its economic and safety requirements.

6.3 Distribution of Power

678. Within the maritime system there are three power groups that exercise some influence over the maritime system:

- *Regulatory power group*: defines the framework for the maritime system in both economic and safety dimensions. The regulatory powers want clear and simple rules along with the authority and ability to enforce the rules. In most countries a maritime authority or government department exercises most of the regulatory power.
- *Commercial power group*: provides the mechanism or means for transporting passengers and cargoes from one place to another.[61] The commercial powers are essentially the organisations rather than the individuals that make up the vessel operations, ports and sea lane subsystems – they produce goods and services (transport, training, vessels, etc), or buy goods and services (eg fuel, parts, vessels, maintenance, etc) or sell these goods and services. Most organisations accept the need for rules provided they do not unduly affect them or alternatively favour a competitor – rules can sometimes be seen as a way of keeping out potential rivals. The commercial powers expect to be consulted on the rules and want them to be written in a simple format. A characteristic of commercial powers is that safety has not always been a prime objective; today, in many sophisticated organisations, safety is a fundamental ingredient in the producing system. Nevertheless there are different ambition levels in terms of safety and profit. A similar observation could be made regarding the attitude of commercial powers towards the environment. There is generally a high level of knowledge,

[61] This broad categorisation more accurately reflects the commercial part of the maritime system. Non-commercial participants, such as sailing for sport or recreation (viz yacht clubs), mostly use goods and services that are provided on a commercial basis (eg components, parts, fuel, maintenance services, ports, jetties, navigation aids) that are provided by organisations within the commercial group. So they may be considered to be part of that group.

skill or experience amongst the commercial power group. The success of the commercial power group is largely measured by its ability to make a return on the capital employed and the ability to generate assets. Usually the shipping lines, and ports exercise considerable commercial power on the system and are considered to be major "players" in the system.

- *3rd party power group:* are those organisations and individuals outside the maritime system but with a direct interest in what goes on within the system and with what is produced within the system. The most important 3rd party power is the passenger and cargo owner but in some countries politicians are arguably the most influential 3rd party power. Others include: freight forwarders, insurance companies, banks, lawyers, industrial groups and unions, people who live near ports, the news media and society at large. 3rd party powers have an interest in the activities of commercial powers and in the process of regulation, especially freight rates, fares and safety issues. A characteristic of 3rd party power is that it can create an impact out of all proportion to the potential impact of the other two powers (e.g. news media).

679. *Figure 6.3* illustrates the interplay of the power groups and their relative relationship to the safety goals and objectives of the system. The safety regulator's prime responsibility is to safeguard the interests of fare-paying passengers and cargo owners and other 3rd parties, such as recreational sailors as well as the crew.

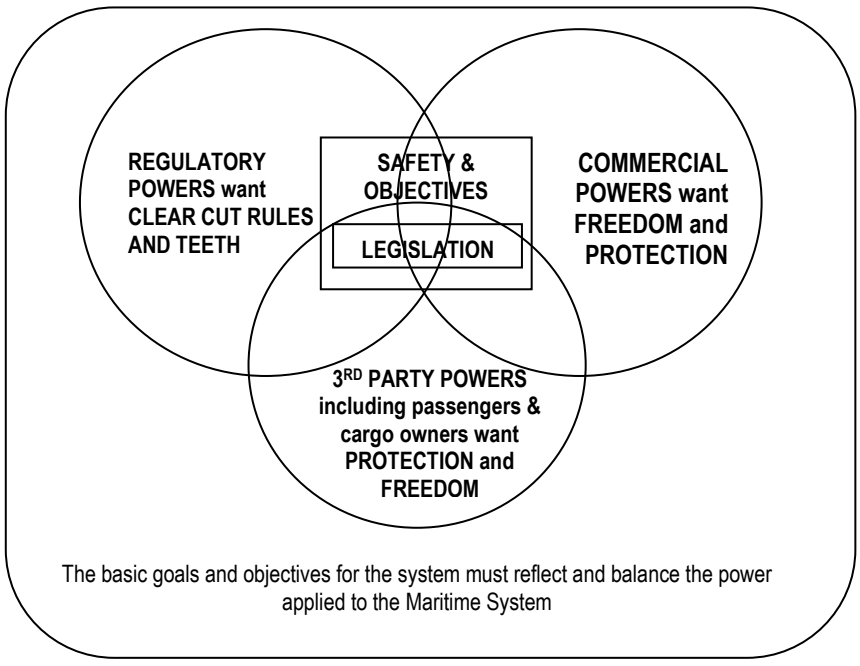
680. Historically, free market forces have not been trusted to do a completely satisfactory job in maritime safety. There are a number of vested interests that justify regulation.

681. If there was a good balance between the commercial and 3rd party powers then there would theoretically be no need for a regulator. In practice there is a continuous interplay between various organisations (and individuals) in pursuit of their own goals and objectives – both safety and economic.

682. Furthermore, there are a number of external forces that are applied to the maritime system. These forces emanate from political, economic, technological, social and environmental changes that surround our every day life. These external forces are not necessarily received and accepted by the three different powers in a uniform manner. Regardless, these forces influence society's ambitions.

683. Maritime legislation must reflect society's ambitions and at the same time take account of the balance of power within the maritime system.

Figure 6.3: **The Power Play within the Maritime System**



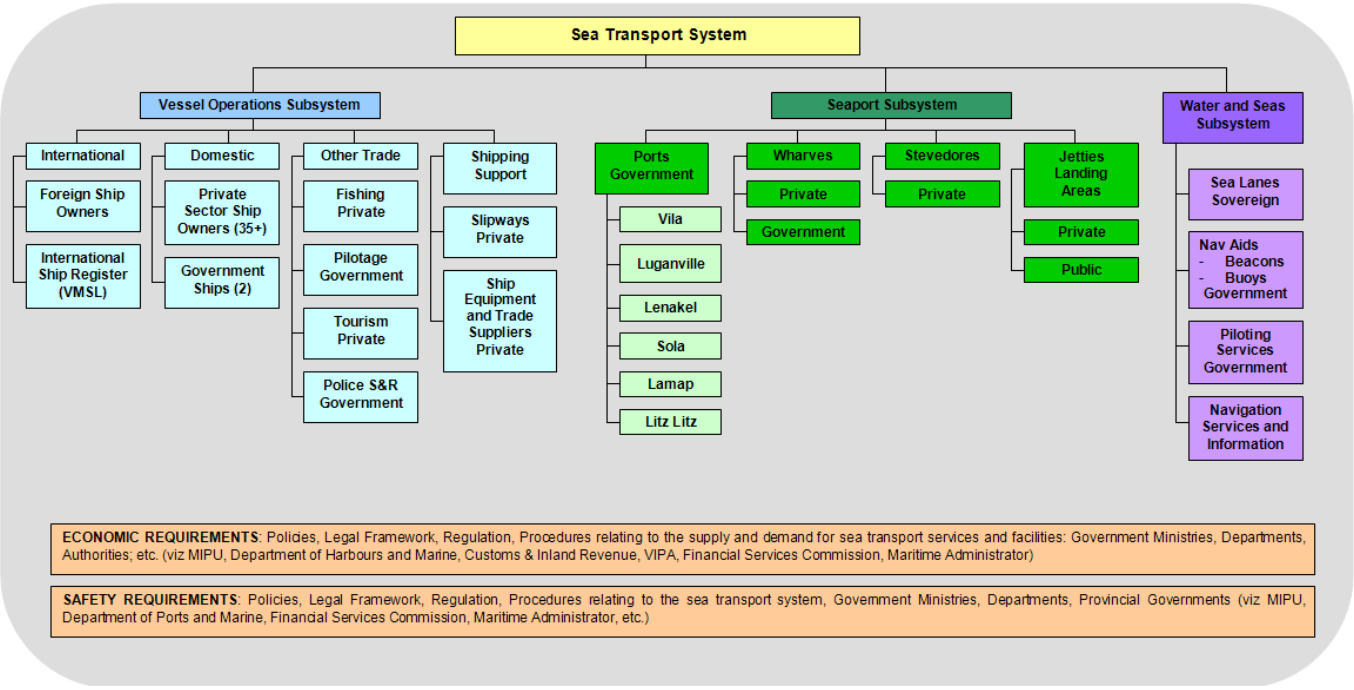
6.4 Vanuatu Sea Transport System

684. The sea transport system is concerned with the safe and efficient transportation of passengers and cargo by sea from one place to another around the Vanuatu coast and between the islands of Vanuatu as well as to and from Vanuatu. This study focuses on the domestic inter-island transport system. The sea transport system comprises:

- The *vessel operations subsystem*, which consists of all functions, involved in enabling a vessel to sail safely and efficiently from one place to another, including the functions serving vessels in port. It includes: ship owners, ship operators, shipbuilders, dry docks, maritime equipment manufacturers, *etc* involved in the international and domestic trades including ships registered in Vanuatu and foreign countries. It also includes vessels involved in fishing, pilotage, tourist operations, dredging, *etc* within Vanuatu waters and seas – it does not include naval vessels.
- The *seaports subsystem*, which provides the necessary services and facilities around the coast and in port for vessels to berth, to load and unload passengers and cargo, to refuel and re-supply vessels and for dealing with marine pollution. This subsystem includes port authorities in the form of government departments (Department of Ports and Harbours), provincial councils, harbourmasters, port and wharf owners, stevedores and border protection agencies. It includes jetties and landing areas on inner and outer islands.
- The waters and seas (navigation) subsystem, which provides the sea-lanes, lighthouses, beacons, buoys, communications, piloting services, and navigation services and information needed for the safe completion of voyages. The navigation system is owned by a mix of government and provincial government agencies and in odd places private enterprise – for example a radio network. The sovereignty of Vanuatu extends beyond the land and internal waters to the archipelagic waters and territorial sea. Vanuatu has exercised its rights concerning an exclusive economic zone (EEZ). International seas are free (from sovereignty claims).

685. The participants and institutional arrangements are illustrated in *Figure 6.4*. This does not purport to be complete but is a good illustration of the mix of public and private ownership showing the extent of private ownership in Vanuatu. For example, private ports could be added where the wharf is outside the defined limits of a government port.

Figure 6.4: **Vanuatu Sea Transport System**



6.4.1 Current Legal Framework

686. Not unsurprisingly the three subsystems of the Vanuatu sea transport system are subjected to economic requirements (ER) plus safety and security requirements (SR). These requirements are prescribed in a number of Acts and Regulations. Acts that in one way or another affect the sea transport system are listed in *Table 6.5*. Regulations that apply are summarised in **IB**.

Table 6.5: **Legal Framework for Vanuatu Sea Transport System**

Serial	*Name of the Act*	*ER*	*SR*	Commenced
	Maritime Safety & Sea Transport			
1	Derelict Vessels (Disposal) Chapter 9	√	√	1923
2	Maritime Chapter 131	√	√	1981
3	Maritime (Conventions) Chapter 155	√	√	1982
4	Motor Boats (Control) Chapter 57		√	1971
5	Prevention of Collision at Sea Chapter 166		√	1983
6	Search and Rescue Chapter 89		√	1976
7	Shipping Chapter 53		√	1968
8	Vanuatu Foreign Investment Promotion Chapter 248	√		1998
9	Vanuatu Maritime Authority (Repeal) Act 2007	√	√	2008
	Ports & Harbours			
10	Customs Chapter 257	√		1999
11	Foreshore Development Chapter 90	√		1976
12	Harbour Lights Chapter 2		√	1914
13	Port Vila Harbour (Prohibited Area) Chapter 22		√	1952
14	Ports Chapter 26	√	√	1957
15	Public Health Act 1994		√	?
16	Santo Wharf Project (Loan) Act 1990	√		1990
	Waters & Seas			
17	Maritime Zones Chapter 138	√		1982
18	Environmental Management and Conservation Act 2002	√		2003
	Special Economic Requirements			
19	Business Licence Chapter 249	√		1998
20	Excise Chapter 290	√		2003
21	Government Contracts & Tenders Chapter 245	√		1998
22	Vanuatu Financial Services Commission Chapter 229	√		1993
	Other Special Requirements			
23	Decentralization Chapter 230	√	√	1994
24	Leadership Code Chapter 240	√	√	1998
25	National Disaster Chapter 267		√	2000
26	Public Service Chapter 246	√	√	1998
	Total number	18	16	

687. There are at least a total of 26 Acts that prescribe various requirements on the sea transport system and its participants; 18 relate to economic requirements and 16 relate to safety requirements. Those Acts particularly relevant to the sea transport system are Chapter 131, the Maritime Act (to cater for what is sometimes referred to as “big ships”); Chapter 53, the Shipping Act (for the “little ships”); Chapter 26, the Ports Act; and Chapter 38, the Maritime Zones Act. Chapter 155 the Maritime (Conventions) Act details the international maritime conventions to which Vanuatu has acceded and taken into its law.

688. The present legal framework has been inherited from the colonial era (*e.g.* Ports Act 1957, Shipping Act 1968) with few improvements since. The scope and level of detail in some Acts are more suited to regulations or rules that prescribe safety standards, fees and charges (economic matters) or administrative detail. Some Acts contain only material that is better relegated to rules and regulations (*e.g.* Chapters 2, 9, 57, 22, *etc*)

689. Since the introduction of the Maritime Act in 1981 (essentially providing for economic requirements), this together with the Vanuatu Maritime Authority Act of 1998, has dominated the shipping industry and has tended to blur the responsibility between the economic and safety requirements of the industry. And, it can be argued, distanced the government from some of its responsibilities in the regulation and administration of the sea transport system.

690. Before its repeal in 2007, Chapter 253 the Vanuatu Maritime Authority Act (that commenced in 1999) established the Vanuatu Maritime Authority which, amongst other things, was the safety regulator. It was directly linked to Chapter 131, the Maritime Act, by provision in Chapter 253 for the Authority to appoint (with the Minister's consent) the Commissioner of Maritime Affairs to perform functions under the Maritime Act. Chapter 53, the Shipping Act was similarly linked where the Commissioner was also the Principle Licensing Officer who was effectively the 'safety regulator'. Under Chapter 131 the Vanuatu Maritime Authority also appointed the Maritime Administrator, whose functions are to administer the Vanuatu international shipping register.

691. The Vanuatu Maritime Authority (Repeal) Act 2007 made provision for the Prime Minister to appoint in writing such persons to carry out the functions, powers or responsibilities that were previously exercisable by the Vanuatu Maritime Authority (VMA) or the Commissioner of Maritime Affairs.

692. In turn the Minister of Infrastructure and Public Utilities was allocated "the responsibility of regulating the maritime industry and shipping generally in Vanuatu" and "the general administration of the Shipping Act". Subsequently a Principle Licensing Officer was appointed within the Department of Ports and Harbours and presently provides safety oversight of the Vanuatu sea transport system with four licensing officers appointed in accordance with the Shipping Act.

693. The Minister of Internal Affairs (*viz* Police Maritime Wing) was allocated the responsibility for maritime search and rescue.

694. The Minister of Finance and Economic Management was allocated the responsibility for the management of the Shipping Register for vessels of Vanuatu engaged in foreign trade plus the general administration of Chapter 131, the Maritime Act and all Regulations and Orders made under that Act. It was envisaged that the Vanuatu Financial Services Commission would have a role in this. Vanuatu Maritime Services Limited (VMSL) was appointed the Maritime Administrator by the Vanuatu Maritime Authority and continues in that role. VMSL's principle role is the administration of the international shipping register. In the meantime and in the absence of a Commissioner of Maritime Affairs VMSL deals with the Ministry of Finance and Economic Management.

695. Chapter 89, the Search and Rescue Act of 1979, provides for the organisation of search and rescue operations in Vanuatu and surrounding waters. Under CAP 89 the control of Vanuatu's marine-air search functions is delegated to the Director of Ports and Marine. Vanuatu falls within the search and rescue region in the South-west Pacific that is assigned to France. The 2004 agreement between France and Vanuatu on maritime search and rescue the Vanuatu Maritime Authority is regarded as Vanuatu's 'central alerting post'. With the demise of the Vanuatu Maritime Authority the Minister of Internal Affairs and in turn the Police Maritime Wing has been allocated the responsibility for maritime search and rescue. It is recommended that CAP 89 be amended to replace the Director of Ports and Marine with the Commanding Officer of the Police Maritime Wing and the agreement with France be amended accordingly.

696. Since the demise of the Vanuatu Maritime Authority there has been considerable blurring of responsibility for maritime safety regulation and for economic (regulatory) requirements within the Vanuatu sea transport system. Despite this it seems that the administration of the Vanuatu international shipping register has not been seriously hindered any more than when the Vanuatu Maritime Authority existed.

697. At the regulatory or rules and standards level there are only 13 regulations directly governing the performance of the Vanuatu sea transport system. Seven contain safety riles and requirements (standards) and seven contain economic rules and requirements. *Table 6.6* summarises the regulations.

Table 6.6: **Regulations for Vanuatu Sea Transport System**

Serial	*Name of the Regulation*	*ER*	*SR*	Commenced
	Maritime Safety & Sea Transport			
1	Maritime Regulations	√	√	1990
2	Maritime (Protection of Mammals) Regulations	√		1988
3	Maritime (Radio) Regulations	√		1981
4	Ship Security Alert System Regulations		√	2005
5	Shipping (Anti-terrorism) Regulations		√	2006
6	Shipping (Registration of Vessels) Regulations	√		1999
	Ports & Harbours			
7	Port Security Regulations		√	2004
8	Ports (Approved Private Installations) Regulations	√		1986
9	Ports (Compulsory Pilotage at Ports of Port Vila and Luganville) Regulations		√	1973
10	Ports (Dues, Fees and Charges) Regulations	√		1987
11	Ports (Operations in Luganville) Regulations		√	1957
12	Ports (Operations in Port Vila) Regulations		√	1965
13	Ports of Entry Statutory Order	√		2002
	Total number	7	7	

6.4.2 International Obligations

698. The Vanuatu maritime legal framework should provide for international maritime law instruments (viz treaties, agreements, conventions, protocols, codes and rules) that Vanuatu is a signatory to and that are in force. It is understood that Vanuatu is a signatory to at least 46 such instruments.

699. As noted in paragraph 687 above, Chapter 155, the Maritime (Conventions) Act, details the international maritime conventions to which Vanuatu has acceded and taken into its law. This Act details 19 such scheduled conventions. However, according to Vanuatu Maritime Services Ltd, the entity that administers the Vanuatu international shipping register there are 46 international maritime law instruments that Vanuatu have acceded to. Chapter 155 has not been amended to incorporate the additional instruments that Vanuatu has acceded to since 1982.

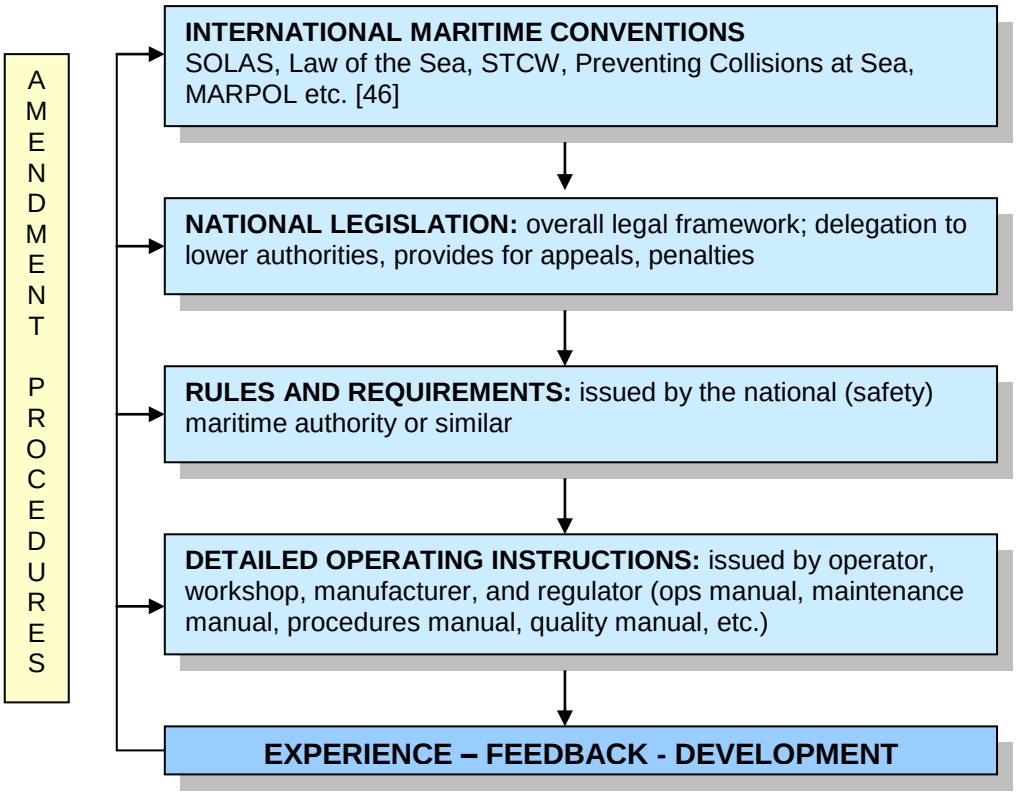
700. Arguably the most important of the international law instruments (together with their Protocols) are the:

- United Nations Convention on the Law of the Sea (UNCLOS) [Vanuatu ratified and acceded to on 10 August 1999]
- International Convention for Safety of Life at Sea (SOLAS) 1974 [scheduled convention in Chapter 155]
- Convention on the International Regulation for Preventing Collisions at Sea 1972 [brought into Vanuatu law by Chapter 161]
- International Convention for the Prevention of Pollution from Ships 1973, Protocol 1978 (MARPOL 73/78) [scheduled convention in Chapter 155]
- International Convention on Load Lines (LL) 1966 [scheduled convention in Chapter 155], and
- International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) 1978.

701. Vanuatu joined the International Maritime Organisation in 1986.

702. *Figure 6.7* illustrates the legal structure that transfers the commitments a State has as a signatory to international law instruments into national legislation. This structure exists in one form or another in the domestic legislation for each signatory State in developed maritime nations and many developing maritime countries too.

Figure 6.7: **Legal Structure for the Maritime Safety System**



703. Legislation is generally at two levels:

- at the top level a maritime safety act which is decided at parliamentary level; and
- below, rules, regulations and accompanying government orders and requirements which are decided at government level.

704. Under these statutes the safety regulator (*i.e.* maritime administrator or authority) is usually delegated the authority by parliament to issue technical standards, rules and requirements to implement the objectives of the act and regulations.

705. These enable the operator (*i.e.* shipping company, ship operator, sea port, harbour, piloting services provider, stevedore, or navigation aid provider, etc) to, in turn, issue detailed instructions to enable their people to carry out their functions in compliance with legislation, regulatory standards, orders and the operator's own requirements. These instructions are set out in a standard operating procedures manual.[62]

706. Provision needs to (must) be made for amendments at all levels of the legal structure to provide flexibility and to cope with the external forces on the maritime system, especially technological changes.

6.4.3 Current Safety Requirements

707. It is evident that the current legal framework and regulations provide for a number of safety requirements that tend to be piecemeal and patchy. In the more substantial Acts the safety requirements are interspersed with economic ones. But essentially these requirements to a greater or lesser (mostly lesser) extent provide for the safety oversight of ship operations subsystem, the ports subsystem and the sea lanes and waterways subsystem. The main provisions of Vanuatu's safety requirements and oversight are outlined below in sections 6.5, 6.6 and 6.7

[62] The regulator too will (must) also set out its own detailed instructions on how to develop rules, standards, carry out inspections and audits, enforce compliance and initiate enforcement actions, *etc* in its own procedures manual.

6.4.4 Current Economic Requirements

708. There are a number of Acts and Regulations dealing with various economic requirements relating to the sea transport system that in one way or another affect the supply and demand for various services and facilities within this system. These were identified in Appendix 1 to the Phase I report[59] and summarised below.

709. In 2000 the Coastal Trading (Control) Act was repealed which, in turn, effectively allowed for cabotage (trade in 'coastal' waters) by foreign ships. This is done by a New Caledonian shipping company, Compagnie Maritime des Iles, using the *Havannah* calling at Port Vila, Lakatoro (Liz Litz) and Luganville as part of voyages to and from Noumea. Worldwide, other than cabotage, sea transport systems are now generally devoid of market related economic requirements and so regulations.

710. The Shipping (Registration of Vessels) Regulations require that the owner of a vessel carrying passengers for hire or reward or a vessel over 8 metres in length engaged in commercial trade must obtain a certificate of registration. Amongst other things registration requires that the registered owner has, and continues to hold, public liability, pollution clean-up, and wreck removal insurance cover for amounts appropriate to the size of the vessel. It seems that in recent years (before the disbandment of the Vanuatu Maritime Authority) this Regulation has not been and is not being complied with nor enforced – many vessels in Vanuatu trade without explicit insurance cover and so are effectively (or ineffectively) self-insured. If this requirement was strictly enforced then it may bring about the reduction in a number of passenger and cargo services that otherwise would not be provided. Failure to register attracts a fine up to Vt100,000.

711. Marine insurance is a contentious issue amongst ship owners in Vanuatu. Few vessels in the domestic fleet seem to be insured for marine hull and machinery insurance let alone protection and indemnity insurance. The fleet comprises a number of old vessels (20 years or more) and these are 'uninsurable' by the insurance industry and so ship owners effectively (or ineffectively) self-insure. The issue, however, is protection and indemnity insurance. Furthermore it seems that both ship owners and regulators are not in accord on the need for and benefits of insurance. Regardless, it should be seen as an 'economic' matter and not a 'safety' matter.

712. Marine insurance has three main components: cargo insurance (taken out by the cargo interest), hull and machinery insurance, and, protection and indemnity insurance (both of which are taken out by the ship owner or operator. It is the last of these, protection and indemnity insurance, that covers the risks that legislation requires for an owner to be able to register a ship.

713. Chapter 248, the Vanuatu Foreign Investment Promotion Act, promotes and fosters foreign investment in Vanuatu. There are certain reserved investments and occupations for Vanuatu citizens where foreign investors cannot participate. What is referred to as 'coastal shipping' is a reserved investment for ships of less than 80 tonnes. It is possible that this restriction or reservation on foreign investment has no material affect on the characteristics of the Vanuatu domestic shipping fleet or the domestic shipping market. Foreign investors are required to obtain an approval from the Vanuatu Investment Promotion Authority (VIPA) in order to "invest" in 'coastal shipping'.

714. Able seaman and ordinary seaman, dock worker and freight handler are occupations reserved for Vanuatu citizens.

715. Chapter 249, the Business Licence Act, provides for the licensing of businesses, which states that, subject to certain exemptions, no person shall carry on a business without a business licence – the penalty for doing so is a fine up to Vt500,000 or imprisonment up to one year or both. Masters, officers and crews of merchant or trading vessels unless they are engaged in business are exempt from business licences. A foreign investor with an approval certificate from the VIPA is entitled to be issued with a business licence(s) in respect of an investment proposal. A business licence is generally issued for one calendar year and may be renewed.

716. Some business activities require approval of the Minister responsible for Finance and these are specified in the Business Licence Act – domestic shipping, port operations and related activities are not specified. Otherwise the Director of the government department responsible for the administration of business licences (Department of Customs and Inland Revenue) or local government councils issues the business licence to both foreign investors and Vanuatu citizens.

717. The application form for a business licence seeks certain information to be provided by the applicant for the licence (licensee). For a shipping business (Class E transportation, storage facilities and

tourism services) apart from general information and the name of the ship(s) involved, the applicant (licensee) is also required to provide details of the current safety certificate, certificate of registry and a current insurance certificate (type not specified).[63] Once this information is provided in hard copy and on payment of the annual licence fee a business licence is issued.

718. The Excise Act provides for the exemption from customs duty for certain excisable products – fuel oils and plant, machinery and materials (*inc* spare parts) used by cargo vessels engaged in inter-island transport qualify.[64] Ship owners pay customs duty of Vt15 per litre instead of Vt30 per litre and a rate of only 5% on spare parts, *etc,* instead of about 25% on average. Also there is no customs duty on the import of ships. These are indirect payments or benefits-in-kind that are received by suppliers of domestic shipping services and are a form of subsidy, which is a form of market intervention (providing for lower than normal operating costs). The indicated purpose for this subsidy is 'economic relief' but it is unclear whether the relief is targeted at the ship owner as provider of services or the user of inter-island shipping services.

719. It is questionable whether these forms of subsidies and market interventions result in benefits to the people of Vanuatu. For example, whether the Vt 12.5 million subsidy ship owners received in 2007 and again in 2008 enhanced the economic and social development of the outer islands or whether the main beneficiaries were the ship owners.

720. The Ports Act is a mixture of safety and economic requirements. The provisions of the Act relating to economic requirements (supply and demand for ports services and facilities) include: declaring ports of entry into Vanuatu, places to be a port and the limits of such a port, the licensing of the erection of private port installations, fees and charges to be paid at Government wharves. This will be further discussed in section 6.7 below.

721. The ports of Port Vila, Luganville, Lenakel, Sola and Lamap have been appointed ports of entry under the Customs Act, however, additional ports of entry may have been declared under some other authority.

722. The Foreshore Development Act regulates the carrying out of works on the foreshore, which requires the consent of the Responsible Minister (the Minister responsible for town and country planning – the Minister of Lands). There is an overlap in the responsibilities between this Act and the Ports Act and so the potential for a blurring of responsibility.

723. The Santo Wharf Project (Loan) Act simply provides for the borrowing of money from the Asian Development Bank to fund the cost overrun to complete the development of Santo wharf.

724. Chapter 138, the Maritime Zones Act, prescribes the extent of Vanuatu's sovereignty beyond the land and internal waters and its rights over the continental shelf and Exclusive Economic Zone (EEZ).

6.5 Maritime Act

725. Chapter 131 (CAP 131), the Maritime Act, provides for the establishment of a shipping register for vessels of Vanuatu engaged in foreign trade - the "big ships" or sometimes referred to as the 'Convention Ships'. [65] While it mainly concerns economic requirements it also provides for some safety requirements. As noted the original Act had its origins in 1981.

726. Since the repeal of the Vanuatu Maritime Authority Act, CAP 131 suffers from inadequate provisions for the delegation of power to key persons. In its present form CAP 131 delegates power to the:

(a) *Minister responsible for the Register of Ships and Seafarers* previously the Minister of Infrastructure and Public Utilities and now the Minister of Finance and Economic Management

[63] The reason for requiring an insurance certificate as a prerequisite for the issuing of a business licence is not known. No authority could be found for this requirement or for the provision of any other information supplied that is not specified on the business licence application form such as details of the current safety certificate and certificate of registry. The requirement to provide such information, which is also required for a certificate of registry of the vessel, seems to be unnecessary and discretionary on the part of the regulator. Moreover the present situation seems vulnerable to abuse or maladministration.

[64] Chapter 91 Import Duties (Consolidation) Act, Schedule III, Section 1 Economic Relief

[65] Foreign trade is trade between Vanuatu and a foreign country or between one foreign country and another – Chapter 131 Maritime Act section 1.

with powers to make rules and regulations (but always on the recommendation of the Commissioner) for the registration of vessels plus four other specific functions, to establish (on the recommendation of the Commissioner) standards for seaworthiness, appoint classification societies, and to carry out lesser functions.

(b) *Vanuatu Maritime Authority* (Authority) prior to its disbandment on 31st December 2007 had powers to appoint a Maritime Administrator, to establish rules and standards for personnel licensing, to prescribe fees and penalties not already provided in the Act, and to take and appoint people to receive declarations. These powers are (about) to be assumed by the 'Minister'.

(c) *Commissioner of Maritime Affairs,* appointed by the Vanuatu Maritime Authority, had extensive powers covering most functions covered in the Act, for example: to delegate authority and powers, to undertake various and general tasks (e.g. special agents), to make rules and regulations for tonnage statements, issue certificates, licenses, waive requirements, make recommendations to the Minister, take declarations, etc. Currently a Commissioner does not exist.

727. As noted CAP 131 provides for a *Maritime Administrator* to be appointed by the Authority. The Act is silent about the role and functions of the Administrator other than that the terms and conditions are left open to the Authority. Such provisions are extraordinary. The duly appointed Maritime Administrator is Vanuatu Maritime Services Limited (VMSL). VSML has a contract with the Government of Vanuatu (GoV) in which its appointment as the Maritime Administrator was renewed and for VMSL to be the GoV's sole agent for the purposes of administering the Vanuatu international shipping register. There is also a contract between the GoV and Vanuatu Maritime Marketing Limited (VMML) to market and promote the Vanuatu international shipping register and in doing this is appointed the GoV's sole (maritime marketing) agent. The Vanuatu Maritime Authority represented the GoV in concluding these contractual arrangements. Section 7.8.6 elaborates on these arrangements.

728. Amendments to CAP 131 are presently under way to clarify and rectify the delegations of power to key persons. Essentially the 'Minister' replaces the 'Authority'. The powers of the Minister to make rules and regulations are to be clarified and subject to the approval of the Council of Ministers may appoint a Commissioner of Maritime Affairs and Deputy Commissioners.

729. Curiously CAP 131 provides for the adoption by Vanuatu of US non statutory maritime law.[66] It is understood that this provision was included for marketing reasons at the time the Act was established in order to compete with other international shipping registers of the time (*eg* Liberia).

730. There are 11 Parts to CAP 131; six parts deal with economic requirements (ER) relating to shipping and one part focuses on safety requirements (SR) for shipping while three parts provide for both economic and safety requirements (ER+SR). It can be argued that CAP 131 is essentially concerned with economic requirements and this is its very being – to establish an international shipping register for the purposes of earning revenue for the GoV.

731. *Table 6.8* summarises the provisions of CAP 131 against these types of requirements (ER versus SR).

[66] Now it is uncertain what US non statutory maritime law refers to.

Table 6.8: **Provisions of CAP 131**

Part	Type	Provisions
1	ER+SR	*General*: interpretations
2	ER+SR	*Administration*: prescribes powers to the Authority (to be Minister), Commissioner, Deputy Commissioners, including that for the appointment of a Maritime administrator.
3	ER+SR	*Construction*: Vanuatu law to apply and the adoption of United States non statutory general maritime law (where not in conflict with Vanuatu statutory law), and for general penalties and appeals.
4	ER	*Documentation and Identification of Vessels*: this Part provides for the registration of ships, certificates of registration, provisional certificates of registry and temporary arrangements.
5	ER	*Preferred Ship Mortgages and Maritime Liens*: this Part provides for transfers, transmissions and mortgages of ships plus specific and general matters relating to ownership, mortgages and other interests.
6	ER	*Carriage of Goods by Sea*: that includes its own interpretations provisions and applies to carriers (owners or charterers) who enter into a contract of carriage for goods but not for the carriage of passengers.
7	ER	*Limitation of Shipowners Liability*: entitlement, claims, calculations of liability.
8	ER	*Radio*: administration of maritime mobile radio stations.
9	SR	*Rules of Navigation*: this part applies to both domestic shipping and international shipping and the provisions of the Convention on the International Regulations for Preventing Collisions at Sea (COLREG) 1972 to which Vanuatu has acceded are adopted.
10	ER+SR	*Wrecks and Salvage*: this Part mostly provides for economic concerns involving salvage with reference to marine casualty and investigations that can have a maritime safety dimension.
11	ER	*Merchant Seaman*: this Part is confined to ocean going merchant vessels of more than 75 net tons and concerns the terms and conditions of seafarers, labour contracts, behaviour, offences penalties, mediation, appeals, etc

732. CAP 131 is supported by the Maritime Regulations that are similarly a mixture of economic and safety requirements. Significantly the Regulations (section 33) provide for the Commissioner to appoint a Marine Inspector to inspect vessels in regard to Vanuatu's flag state control obligations (this is a matter that might be more appropriately found in the Act). The provisions for port state control are somewhat blurry; arguable CAP 131 provides for this. Regardless, port state control has been and is carried out from time-to-time. The Maritime regulations also include a chapter (4) on the prevention of pollution of the sea by oil. This appears to be the only reference to marine pollution and the marine environment in Vanuatu legislation.

733. Three chapters (2, 3 and 5) support the Vanuatu international shipping register, its open registry. In this regard some of the detail in CAP 131 could be moved into the regulations (which applies to the provisions for merchant seamen too).

734. The Regulations provide for the Commissioner or Deputy to institute a marine investigation to determine *both* the cause of the casualty or accident *and* the attribution of blame. Such investigations are generally recognised as involving a conflict of interest requiring two separate investigations: one to establish the cause and the other to determine responsibility and whether an offence has occurred. The definition for 'marine casualty' is inadequate.

735. Also and significantly the Maritime Regulations includes a chapter pertaining to 'Near-coastal Voyages'. The Regulations are linked to Chapter 53, the Shipping Act, with respect to manning. The Regulations also specify that "examination officers [for candidate certification] within Vanuatu are limited to the requirements for service on vessels of less than 500 gross tons engaged in near coastal voyages" and that and certification be in accordance with CAP 53 unless the candidate meets the requirements for service on vessels of 500 gross tons or more.

736. The Maritime Regulations are the primary regulations that set the standards and rules for the performance of the ship operations subsystem and the sea lanes and waterways sub system. These Regulations are sparse and compared to rules, regulations and standards adopted by other IMO states within the region they are inadequate and do not provide a good base for putting into operation a satisfactory safety regulatory oversight system.

6.6 Shipping Act

737. Chapter 53, the Shipping Act, provides for the control and safety of Vanuatu vessels but not to vessels registered under the Maritime Act; that is, what are referred to as “little ships” or “non Convention ships”. The original Act commenced in 1968. In its present form CAP 53 delegates power to the:

i) *Minister responsible for the Register of Ships and Seafarers* – since the repeal of the Vanuatu Maritime Authority Act the Minister of Infrastructure and Public Utilities has been allotted the responsibility for regulating the maritime industry and shipping generally in Vanuatu and the general administration of the Shipping Act with powers to make rules and regulations by Order.

ii) *Vanuatu Maritime Authority*, prior to its disbandment on 31st December 2007, had limited powers to decide on whether a formal accident inquiry is needed and established the tribunal for appeals. The Authority also had some minor powers in a Schedule. These powers are (about) to be assumed by the ‘Minister’.

iii) *Principal Licensing Officer* was to also be the Commissioner of Maritime affairs but since the repeal of the Vanuatu Maritime Authority Act the Commissioner no longer exists but the Principal Licensing Officer still exists in law and in practice. The Principal Licensing Officer has wide powers to grant licenses, certificates, survey vessels, examine seafarers, grant exemptions and amongst other powers, cancel, suspend, revoke licences, certificates and detain vessels.

738. CAP 53 is solely concerned with safety requirements and there are 13 Parts to the Act plus 13 Schedules. *Table 6.9* outlines the provisions of the Act.

739. As noted CAP 53 has 13 Schedules that detail grades and standards for various certificates of competency, fees, the syllabus for examinations, standards for minimum crew requirements, freeboard standards and formats for various certificates. All these standards are more properly prescribed in Regulations.

740. CAP 53 is supported by three Regulations: Shipping (Registration of Vessels) Regulations [commencement 1999], an economic requirement; the Shipping (Anti-terrorism) Regulations [2002] and the Ship Security Alert System Regulations [2005] both safety requirements.

741. Vessels other than foreign vessels operated within Vanuatu’s economic zone that is over 8 metres in length engaged in commercial fishing or commercial trade or that carries passengers for hire or reward must be registered. Paragraph 710 above discusses ship registration requirements.

Table 6.9: **Provisions of CAP 53**

Part	Type	Provisions
1	SR	*General*: interpretations and the powers of Principal Licensing Officer, including the power to appoint Licensing Officers.
2	SR	*Certificates of Competency*: .providing for examinations, prerequisites, conduct of exams, syllabuses, issuing of Certificates of Competency, their cancelation and suspension, equivalency, fraud, misrepresentation and bribery.
3	SR	*Crew Requirements*: need for certificated officers, penalties without proper certificates
4	SR	*Safety Certificates*: prescribes the requirements for the survey of vessels, issuing of safety certificates, revocation and suspension, marking of vessels, repairs and alteration, penalties, loss nor damage of vessel, *etc*
5	SR	*Carriage of Passengers*: provides for the maximum number of passengers to be carried on board a vessel and the requirement for life saving appliances
6	SR	*Loading of Vessels*: prescribes requirements for minimum freeboard
7	SR	*Unseaworthy Vessels*: penalties for putting to sea, impaired forward vision by reason of the disposition of deck cargo or passengers.
8	SR	*Dangerous Goods*: penalties for misdescription, power to deal with
9	SR	Discipline: offences by seamen
10	SR	*Miscellaneous*: radios for foreign going vessels to comply with SOLAS 1974, requirements for other vessels, reporting procedure, sufficient fuel to be carried, provisions for exemptions
11	SR	*Penal Provisions*: offences in connection with ships, endangering life or ship, general penalties
12	SR	*Regulations*: provides power to the Minister to make regulations, appeals
13	SR	*Application*: the provisions of CAP 53 do not apply to vessels registered under Cap 131

6.7 Ports Act

742. As already noted Chapter 26, the Ports Act, is a mixture of safety and economic requirements that provides for the control of ports in Vanuatu. It is one of the older Acts relating to the Vanuatu sea transport system. Of the four oldest Acts (commencement 1914 to 1957 being more than 50 years old) three relate to ports – see *Table 6.5*. The Ports Act commenced in 1957.

743. CAP 26 is least but still affected by the disbandment of the Vanuatu Maritime Authority. The Act delegates power to the:

i) *Minister responsible for ports and marine*: who is the licensing authority for any part of the tidal lands and waters of a port to be used for the convenience of shipping or of the public; and, amongst other things, has the power to appoint harbourmasters and assistants as well as to define the limits to ports. The responsible Minister is the Minister of Infrastructure and Public Utilities.

ii) *Commissioner of Maritime Affairs:* appointed by the Vanuatu Maritime Authority had specific powers to grant, vary or revoke licences to pilots. Currently a Commissioner does not exist and in the meantime there has been uncertainty as to the granting of additional licences or their cancelation. (These powers are (about) to be assumed by the 'Minister'.)

iii) *Harbourmaster:* who has extensive powers covering the movement and security of vessels with a port plus lights, moorings, buoys, obstructions, wrecks, etc. Essentially the harbourmaster is responsible for safety oversight of vessels within a port.

744. Excluding the section providing for the interpretation of words CAP 26 is made up of 10 unnumbered parts that provide for particular requirements and are summarised in table 6.5 according to whether they provide for economic or safety requirements. Four are economic requirements and five are safety in nature while one caters for both economic and safety requirements.

745. While the Minister is the licensing authority for the occupation of the foreshore for the convenience of shipping or of the public, it is noted in paragraph 722 that under the Foreshore Development Act the Minister responsible for town and country planning also regulates the carrying out of works on the foreshore of any island in Vanuatu.

746. CAP 26 is supported by seven regulations (statutory orders): four concerning safety requirements and three economic requirements - *Table 6.6* paragraph 697. The most significant are:

a) *Port Security Regulations:* introduced in 2004 to comply with the International Ship and Port Facilities Security (ISPS) Code that came into force on 1st July 2004 as part of the SOLAS measures.

b) *Port (Operations in Port of Luganville) Regulations*: introduced in 1957 to prescribe a number of mostly safety standards for navigation, berthing priorities (an economic requirement), cargo loading, etc.

c) *Port (Operations in Port of Port Vila) Regulations:* introduced in 1965 to prescribe mostly safety standards for navigation, cargo handling, etc. and also for licensed wharves.

Table 6.10: **Provisions of CAP 26**

Part	Type	Provisions
1	ER	*Ports of Entry*: provides for the nomination of Vanuatu ports as the first port of call for all vessels entering Vanuatu from foreign ports and for the Minister to authorise other ports of entry. (The Customs Act also provides for the appointment of ports of entry – currently five of which two seem not to be provided for by the Ports Act.) The Minister has the power by Order to set port dues.
2	ER	*Ports*: declaration of port limits.
3	SR	*Harbour Masters and Port Officers*: appointment and powers of harbour master, licensing of pilots (by Commissioner), non liability of the Government for acts of pilots, pilotage fees
4	SR	*Explosives*: provisions for vessels carrying explosives, dangerous material and prohibition of use.
5	SR	*Wrecks, Obstructions, Moorings, Ballast*: removal, destruction of wrecks, laying down of buoys or moorings.
6	ER	*Erection of Private Installations in a Port: delegates power to the Minister for the licensing of the occupation and use of the foreshore for certain purposes; provisions for lighting the foreshore.*
7	SR	*Harbourmaster's Power of Entry on Land and Control of Lights:* unhindered passage over land in relation to lights, lighthouses, buoys and beacons; screening of lights.
8	ER	*Government Wharf and Port Charges:* provision by Order for tonnage dues, wharfage charges, port charges, exemptions and the need for harbourmaster's permission to berth at the Government (international) wharf.
9	SR	*Offences and Penalties:* relating to navigation hazards within a port and bribery.
10	ER+SR	*Regulations:* provision for the Minister to make regulations by Order.

747. The provision in the *Port (Operations in Port of Port Vila) Regulations* for licensed wharves is of significance and particular relevance today. Section 3 of this Regulations states:

> **3. Licensed wharves**
>
> (1) Wharves in the port which are not owned by the Government shall only be operated for the loading and unloading of cargo if licensed by the Minister.
>
> (2) Notwithstanding any condition which may be imposed by the licences, owners of licensed wharves shall comply with the following conditions –
>
> (a) to maintain their wharves and the installations thereon to the satisfaction of the Minister;
>
> (b) to refrain from carrying out any extension, reclamation, or construction thereon without the written permission of the Minister.

748. The Project Team have not been able to establish whether non Government-owned wharves are licensed and if they are the terms and conditions of the license are not known. Furthermore it is

evident from Chapter 2, Infrastructure Requirements, that the provisions of section 3(2) (a) are not being enforced.

6.8 Transport (Economic) Requirements

749. In the VISSP1 report the following observations were made concerning economic regulation and are repeated here for the sake of completeness.[67]

750. Economic regulations propose to correct the imperfections of the free market as seen by the regulator. One of the effects from imposing economic regulation is the impact on the level of competition. This is especially true for transport and trading systems because of the opportunities for monopolistic exploitation and because of the concept of 'profit' adopted by various enterprises operating within the system. Nevertheless the impact on competition may well be the intent of the regulator.

751. The problem, however, lies with who benefits from the intervention.

752. Usually the intent is to benefit the public. The end result is often an inefficient incumbent, protected from competition and possibly resorting to monopoly prices. In turn the public are required to pay higher prices than would be the case if competition were present. A regulator often turns to price controls in an attempt to curb the monopoly power or market imperfections, but price controls will not induce efficiency. In other words, competition is the spur towards efficiency and any substitute tends not to address the prime weaknesses of monopolies, namely inefficiencies.

753. Economic regulation in the maritime or shipping sector can thus have the opposite effect than that intended. The intent is to protect the public - the effect can thus be higher prices and lower standards of service for the public or both.

754. Furthermore care should be taken that economic regulation or intervention is not misused as an alternative or additive component to safety regulation. This is because there may well be competing and conflicting incentives that could reduce the safety focus of the regulator and allow safety issues to 'fall through the cracks'.

6.8.1 Vanuatu's Sea Transport Markets

755. The economic and social benefits arising from the Vanuatu sea transport system depend on the effectiveness and efficiency of the system as a whole and its subsystems in particular. Inefficiencies, restrictive trade practices, monopoly abuses, political interference and conduct lessening competition will all reduce the effectiveness and efficiency of the sea transport system. Accordingly where these occur or could occur there can be merit in intervening in the market provided it is done in a measured manner.

756. The vessel operations subsystem, the market for shipping services both domestic and international, is a competitive one except for the remote communities where all the market power rests with the domestic ship owners and operators. This market is predominantly inhabited by the private sector.

757. The Vanuatu ports subsystem is mostly inhabited by the private sector with some public sector participation and is mostly competitive of sorts for domestic shipping. However, the granting of long terms concessions (40, 50 years) to particular companies for the exclusive operation of wharves – both international and domestic – introduces monopoly characteristics for their management and operation. Some concessions cover large geographic areas. For example, the concession between Lenakel Wharf and Stevedoring and the Tafea Provincial Government and the concession agreement between Ifira Wharf and Stevedoring (1994) Limited and the Government of Vanuatu covers the whole of Port Vila harbour – but where, for the present, there is some competition for domestic wharf services while the Dinh (BP) wharf remains in operations.

758. While the focus of this study is domestic shipping the legal framework applies to both domestic and international shipping, as does CAP 26. A 2007 ADB study and a 2008 AusAID study both show that Vanuatu's international ports are the most costly and inefficient in the South Pacific. [68]

[67] Final Report, Appendix 1, section 1.3.
[68] Oceanic Voyages – shipping in the Pacific,: ADB 2007 and also Pacific Economic Survey 2008, connecting the region: AusAID, March 2008

These monopoly arrangements at the international wharf are the main reason for Vanuatu's feeble port performance for exports and imports. For international shipping they stifle efficiency and effectiveness. Until an element of competition is introduced users of ports and wharves will continue to pay for the high cost and inefficiencies of port and wharf operations and, moreover, Vanuatu's economic and social development will continue to be hindered. There is a desperate need to review market arrangements within the international port(s) with the objective of introducing competition in one form or another and so increasing efficiency. Economic regulation is one way of doing this.

759. Presently the Minister responsible for ports and marine is the licensing authority for the use and occupation of tidal lands and waters of a port for, amongst other things, the convenience of shipping. This is in effect an economic license subject to conditions the Minister deems fit. It seems that no such licences have been granted or issued by the Minister in recent years and no current or expired licence has been found.

760. The direct revenue the GoV receives from the Vanuatu sea transport system, apart from indirect customs taxes or similar, is considerable. *Table 6.11* summarises the revenue collected by the department of Ports and Harbours in connection with international shipping between 2005 and 2008. The figure for 2009 is taken from the GoV 2009 Budget Volume 1 Fiscal Strategy Report and it seems the Vt180 million revenue figure is likely to be conservative. The Department of Ports and Harbours is one of the GoV's higher revenue earners.

Table 6.11: **Department of Ports & Harbours Revenue**

Units: millions Vt	2005	2006	2007	2008	2009
Pilotage	22.2	46.2	63.1	63.1	40.0
Line handling, storage	18.6	12.3	14.7	34.3	30.0
Berthage	37.8	80.9	106.5	120.0	90.0
Wharfage	94.5	43.8	35.0	28.8	25.0
Total revenue	**173.1**	**183.2**	**219.2**	**246.1**	**185.0**

761. By contrast the fees earned from the Vanuatu international shipping register are expected to be Vt 40 million in 2009, according to the 2009 Budget – that equates to the revenue earned from pilotage services and about 22% of the total revenue budgeted for by the Department of Ports and Harbours.

762. Overall, government fees and charges relating to the sea transport system are an important part of their economic requirements. The responsible Minister has the delegated power to establish these charges. In turn the services and facilities they relate to need to be properly managed and operated; this includes stevedoring and related wharf operations that are mostly provided for under long term concessions. Arguably this is not currently the case. Economic requirements placed on the sea transport system, especially the ports subsystem would enable Vanuatu to promote efficiency and competition within these markets.

6.8.2 International Shipping Register

763. The international shipping register was established in 1981 as a revenue earner for the GoV. There are currently over 600 ships on the international shipping register. It is understood that the GoV receives about Vt 50-90 million a year from this register. The register thus falls within the economic requirements of the sea transport system. That is provisions for the international shipping register from a revenue earning perspective are more economic than safety. However, there is also a direct link to safety requirements.

764. The success of the Vanuatu international shipping register largely rests on Vanuatu maintaining its 'white list' status with the International Maritime Organisation (IMO). This means that Vanuatu needs to comply with the various international maritime conventions it has acceded to and in particular: SOLAS and STCW (see paragraph 700). If Vanuatu's 'maritime administration' provides inadequate safety oversight and generally fails to comply with SOLAS and STWC then ship's on Vanuatu's international shipping register could (would) be subjected to greater Port State control scrutiny and Vanuatu seafarers may also be unable to find employment in international shipping.

Overall this would have a negative impact on Vanuatu's sea transport system, especially seafarers. Thus it is important that Vanuatu has a credible 'maritime administration' and safety oversight regime.

765. There is also sovereignty issues attached to the international shipping register in that ships so registered receive the protection of Vanuatu law. The corollary to this is that the activities of ships on Vanuatu's register impact on Vanuatu's international reputation.

766. Vanuatu is a contracting party for the Convention to the Conservation of Antarctic Marine Living Resources (CCAMLR). Vanuatu, however, has over the last three or four years been the object of criticism by CCAMLR Commission member countries. In its 2006 report the Commission noted:

> … with concern that Vanuatu was considering deploying five 'super trawlers' in the krill fishery in 2006/07. The information provided by Vanuatu was insufficient to determine whether this additional fishing effort and resulting catches could trigger the limit of 620,000 tonnes of krill agreed in Conservation Measure 51-01. However, it was noted that notifications for 2006/07 contained notifications with expected krill catch levels of 100,000 tonnes per vessel, thereby inferring a substantial potential krill catch could be expected by Vanuatu.
>
> The UK further noted that Vanuatu had failed to comply with the procedures agreed by WG-EMM in notifying its intention to harvest krill in the Convention area.
>
> Some Members recalled that at least one Vanuatu-flagged vessel had harvested krill in the Convention Area in the past and that Vanuatu had failed to comply with relevant CCAMLR data submission requirements. …
>
> In addition, the Commission agreed that the following questions highlighted by SCIC, should be urgently drawn to Vanuatu's attention:
>
> (i) Which of Vanuatu's two ship registers was used to register the five super-trawlers mentioned in the correspondence received from Vanuatu: the Register for domestic vessels or the Register for foreign-owned vessels?
>
> (ii) Whether Vanuatu exercises full Flag State control over activities of these vessels and where the vessels are located or are fishing now?
>
> (iii) What ports would be used for landing the catch?

767. Thus in its 2006 report the CCAMLR Commission was critical of Vanuatu's actions and it is understood individual members 'wondered about' the credentials of Vanuatu's representatives who appeared to be businessmen rather than bona fide State representatives. Individual State representatives also had their views recorded.

> Russia noted that the Commission had already expressed doubt as to Vanuatu's ability to exercise full Flag State control over these vessels. It appeared that the situation confronting the Commission now could be described as the use of Flags of Convenience. In addition, Russia suggested that the Commission should elaborate and adopt a measure which should prohibit fishing in the Convention Area by vessels using Flags of Convenience.
>
> The USA said that Vanuatu should be asked to accept international observers on its krill vessels.

768. In the CCAMLR Commission's report for 2007 the Vanuatu representative noted that Vanuatu had withdrawn its notification to fish for krill in the coming season and that no fishing had been undertaken by Vanuatu-flagged vessels in 2006/07 and also that Vanuatu's ultimate intent is to become a full Member of the Commission and is currently preparing legal instruments to apply for Commission membership. The 2007 report also noted 'with interest' that:

> While Vanuatu had taken steps to ensure that it exercises effective Flag State control over the fishing vessels on its register, it is also relevant to note that the vessels identified in the withdrawn 2007/08 krill notifications had been on the Vanuatu register for 15 years and had been engaged in the South Pacific jack mackerel fishery for the last five years. If, as anticipated, there is a notification from Vanuatu to fish for krill in the 2008/09 season, it will be for these same vessels.

769. The point is that unless Vanuatu conscientiously and consistently lives up to its obligations as a Flag State its reputation as a first class or 'white list' international shipping register will suffer. This

requires not only a competent 'maritime administration' but appropriate Government oversight to protect its sovereignty interests. These matters are separate from the administration and marketing of the register itself, which are economic concerns. Flag State control is a safety requirement whilst the administration of the international shipping register is of a function that falls into the economic requirements of the sea transport system.

6.8.3 Sea Lanes & Sovereignty

770. One of the more significant economic interests is the sovereignty beyond Vanuatu's land and internal waters extending over the archipelagic waters, territorial waters, the rights of passage for all foreign ships along with Vanuatu's rights over the continental shelf and EEZ. Vanuatu is well catered for here as this is provided for in CAP 138, the Maritime Zones Act, which amongst other things provides for a mixture sovereign rights, exclusive rights, exclusive jurisdiction for various activities over and within the continental shelf and EEZ, especially for resources.

6.8.4 Marine Pollution, Environment, Oil Spills, Conservation

771. Economic requirements include provisions for:

- general marine pollution;
- protection of the marine environment from harmful substances;
- protection of the marine environment from hazardous ships, structures, offshore operations;
- plans and responses, including financing, to protect the marine environment from oil pollution;
- civil liability for pollution of the marine environment; and
- compensation and other matters and measures.

772. Vanuatu is a contracting party to about 24 international conventions, protocols, guidelines, agreements concerning marine pollution, the marine environment, oil spills and conservation. Presently Vanuatu's obligations and responsibilities under these international maritime law instruments are unattended and its legal framework is effectively silent on these areas other than noting that Vanuatu is a contracting party.

773. The transport (economic) requirements need to provide for Vanuatu's obligations and responsibilities under these international maritime law instruments or otherwise Vanuatu should withdraw from those international conventions, protocols, guidelines, agreements for which no provisions have been made.

6.9 Safety Requirements

6.9.1 Responsibility

774. The principles of maritime regulations have been tried and tested over a number of years. Both the State and the operator have responsibilities for the safe conduct of maritime operations. The principles essentially rest on the nature of responsibility:

- the State is responsible for setting national standards for the safety of maritime operations and seeking compliance with those standards; and
- the operator is responsible for the safe conduct of their operation and to comply with any regulations the State may promulgate.

775. Thus there is a division of responsibility between the State and the operator over matters of maritime safety and operation, and, the public interest.

6.9.2 Approach to Safety Regulation

776. Experts in safety and health systems have analysed the interaction between a technical system established for safety purposes and the human tasked with carrying out its functions. They have concluded that the way ahead is through effective and integrated systems. Managing safety in organizations, at all levels, is about systems control.

777. There are two aspects to such control: control by design, and control through ongoing management action. It is argued that, in the present context, these two aspects are strongly related as managers have responsibility not only for actions but also for the design of the organization, its work, equipment and work environments.

778. For the maritime industry it is a simple conceptual step to view the various levels of the system such as operations, regulations, policies, and government, as a part of an overall system with their various responsibilities and roles for safety or for transportation – this is the maritime system (see section 6.1 above).

779. Overall a systems approach to safety oversight would conceivably produce more predictable and satisfactory results than other approaches. This is also consistent with the endeavours of the IMO who are attempting, through various initiatives including human factors, to reduce accident rates and improve the safety of life at sea.

780. The life cycle approach described at *Appendix 6.1* is a systems approach. It is recommended that Vanuatu adopt the life cycle approach to safety regulation and oversight for its sea transport system. This is the approach Vanuatu has adopted for the safety regulation of civil aviation and is the basis of the Vanuatu Civil Aviation Act. Likewise the life cycle approach will form the basis of the proposed Maritime Safety Bill (Act).

781. The adoption of the life cycle approach will to a large extent be seamless to individuals requiring licences and certificates of competency as well as to ship owners as far as certificates of seaworthiness is concerned. The biggest to change will concern organisations such as ship operators and wharf operators where the objective will be to introduce certificates of operation (*e.g.* ship operator certificate, wharf operator certificate) where an organisation or individual meets specific safety standards concerning the overall safety management of the organisation itself.

6.10 Separation of Economic & Safety Requirements – Matters of Policy

782. There are a number of very good reasons for keeping safety regulation separate from economic regulation within the legal framework and the institutional arrangements that administer the regulations.

783. Economic regulations deal with the policies and requirements that are aimed at the sea transport market, and in particular at satisfying the supply and demand for public sea transport services. These are, in fact, the transport requirements of the maritime system. The transport requirements are not only confined to sea transport operators but include port and wharf operators and the providers of any maritime service, such as pilotage, that play a role in the provision of public sea transport services.

784. These requirements deal with international and domestic cabotage, tariffs, port charges, navigation facility charges, port facilitation, service standards for ports and other providers of maritime services (e.g. navaids), competition monitoring, sea transport market research, and other activities that have an impact on the “market” for sea transport. This “market” is both the domestic and international market that is of economic, social and political interest to Vanuatu. (In this regard policies and requirements concerning sea lanes and the EEZ, over which Vanuatu has complete and exclusive sovereignty, is a matter of national importance and so are included in transport (economic) requirements.) These interests will be reflected informally or formally in Vanuatu’s sea transport policy that supports the overall national economic, social and political ambitions of the country.

785. It is evident, therefore, that matters of sea transport are more properly matters of trade, commerce and foreign policy than matters of maritime safety. Thus transport (economic) requirements are most effectively and efficiently handled by government organisations like the Ministry of Infrastructure and Public Utilities or a Ministry of Transport.

786. However, the safety requirements of the maritime system refer to policies, regulations, standards and other requirements to achieve an appropriate level of safety in the sea transport system. These safety requirements are quite independent of the transport or economic requirements.

787. As noted in section 6.2.1 transport (economic) and safety policies and requirements are set by governments. It was also noted that it is important to differentiate between these two requirements. As a rule safety requirements must meet minimum standards. Whereas there may be a variety of compromises and "trade-offs" when it comes to formulating transport or economic requirements. In any event, these compromises and "trade-offs" will not involve safety standards. The point is the objectives of these two different requirements are themselves quite different and so governments should and do deal with these two requirements separately – often in separate government departments or entities.

788. There is a direct link between developing policies and monitoring their effectiveness. In order not to blur the accountabilities and responsibilities between transport or economic requirements and those of maritime safety, these two responsibilities should be separated.

789. In conclusion the reasons therefore for not mixing economic and safety regulation are:

- the commonplace difficulty in distinguishing between what are properly economic matters and what are properly safety matters and the potential for blurring the responsibility for the two quite different disciplines (this occurs in Vanuatu today);
- matters of sea transport are more properly matters of trade, commerce and foreign policy and are most effectively and efficiently handled by government organisations responsible for maritime affairs (in most countries this is a Ministry of Transport or similar, in Vanuatu the equivalent is the Ministry of Infrastructure and Public Utilities);
- matters of maritime safety are mostly technical and operational where minimum standards are to be complied with and do not involve 'trade-offs' between foreign policy, industry and commerce policy objectives; and
- the institutional considerations and level of involvement of the Responsible Minister is quite different for economic regulation than it is for safety regulation – the former requires a close and day-to-day involvement by the Minister; the latter requires some distancing between the Minister and the regulator.

790. Any one of these, alone, is sufficient reason for keeping them separated.

791. Furthermore, as a passing comment, there is no reason or identifiable advantage in mixing safety and economic requirements within the same Act or to support putting safety regulation and economic regulation together in the one organisation.

792. It is thus proposed that Vanuatu's maritime law be consolidated into three (Bills) Acts:

- a *Sea Transportation (Bill) Act* to provide for the transport (economic) requirements of Vanuatu's sea transport system;
- a *Maritime Safety (Bill) Act* to provide for the safety and security requirements of Vanuatu's sea transport system; and
- a *Ship Registration (Bill) Act* to provide for the registration of ships in Vanuatu.

793. This arrangement and consolidation puts all existing safety and economic provisions into three Acts. *Figure 6.6* illustrates the proposed consolidation. In addition new provisions will be incorporated to provide for the life cycle approach to safety regulation in the case of the Maritime Safety (Bill) Act. The Sea Transportation (Bill) Act will incorporate provisions for the establishment of ports, economic regulation, marine pollution and environmental protection and expand on existing provisions scattered throughout a number of Acts. The Ship Registration (Bill) Act will establish two shipping registers: an international one and a domestic register.

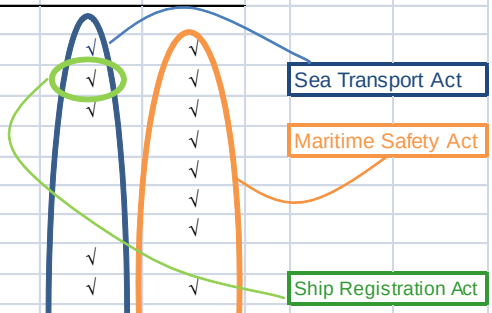
794. The reasons for three separate Acts are:

- to simplify the regulation and monitoring of Vanuatu's sea transportation obligations relating to transport (economic) requirements and maritime safety and security requirements and to make it more clear which entity administers which Act;

- to avoid the blurring of responsibility between transport (economic) requirements and maritime safety and security requirements and to help distinguish between these two quite different requirements; which can be achieved by collecting all the economic development, trade and foreign policy matters relating to the sea transport system together in the Sea Transportation Act – these largely reflect Government policy and so are subject to close Ministerial involvement; and by
- collecting all the technical and operational matters relating to maritime safety together in a Maritime Safety Act – these are largely independent of Government policy other than an objective to have a high level of safety; as well as
- the three Acts are aimed at different users or audiences– the Sea Transportation Act and Ship Registration Act are mainly of interest to owners, investors, and their representatives, whereas the Maritime Safety Act is very much of interest to ship operators, seafarers, engineers, pilots and people directly involved in operating services or facilities within the maritime system. That is two different interest groups or users primarily use different Acts.

Figure 6.12: **Sea Transport System Proposed Legal Framework**

Serial	*Name of the Act*	*ER*	*SR*
	Maritime Safety & Sea Transport		
1	Derelict Vessels (Disposal) Chapter 9	√	√
2	Maritime Chapter 131	√	√
3	Maritime Conventions Chapter 155	√	√
4	Motor Boats (Control) Chapter 57		√
5	Prevention of Collision at Sea Chapter 166		√
6	Search and Rescue Chapter 89		√
7	Shipping Chapter 53		√
8	Vanuatu Investment Promotion Act 1998	√	
9	Vanuatu Maritime Authority (Repeal) Act 2007	√	√
	Ports & Harbours		
10	Customs Act 1999	√	
11	Foreshore Development Chapter 90	√	
12	Harbour Lights Chapter 2		√
13	Port Vila Harbour (Prohibited Area) Chapter 22		√
14	Ports Chapter 26	√	√
15	Public Health Act 1994		√
16	Santo Wharf Project (Loan) Act 1990	√	
	Waters & Seas		
17	Maritime Zones Chapter 138	√	
18	Environmental Management and Conservation Act 2002	√	
	Special Economic Requirements		
19	Business Licence Act 1998	√	
20	Excise Act 2002	√	
21	Government Contracts & Tenders Act	√	
22	Vanuatu Financial Services Commission Act 1993	√	
	Other Special Requirements		
23	Decentralization Chapter 230	√	√
24	Leadership Code Act 1998	√	√
25	National Disaster Chapter 267		√
25	Public Service Chapter 246	√	√
	Total number	18	16



795. The three draft Bills could be easily clipped together to produce one Act. Joining them together would make the Act unwieldy and would negate all the reasons above for consolidating and rationalising existing Acts into three. There is no identifiable advantage in joining the three Acts together, rather only disadvantages. However, the Sea Transportation Act and Ship Registration Act could be joined together. They both deal with economic requirements. The merit or otherwise of doing this probably rests on whether the two Acts have the same responsible Minister.

6.11 Sea Transport Bill

796. The Sea Transportation Bill (Act) would, as its name suggests, provide for Vanuatu's transport (economic) requirements and obligations as a party to a number of international maritime law instruments, particularly those concerning the United Nations Law of the Sea and the marine environment. This new Act would, amongst other things, provide for the economic regulation of sea transportation markets in Vanuatu, provide for marine accident investigation, and consolidate existing laws relating to the sea transportation markets in Vanuatu (*i.e.* shipping services, port services, marine services, *etc*.). It would also provide for a Maritime Fund to receive funds that may be provided by Parliament for the purposes of the three Acts, as well as to receive all monies earned from fees and charges (especially from ports and ship registration), various investments, leases acquired or vested in the MIPU or the national maritime administration or other government department.

797. In particular the Act needs to:

- establish the objective(s) of the sea transport system;
- declare the responsibilities and functions of the responsible Minister (Minister of Infrastructure and Public Utilities);
- declare Vanuatu waters and seas;
- provide for the power of the Minister to make maritime regulations;
- provide for the powers and functions of the licensing authority(s);
- provide for the establishment of a Maritime Fund
- provide for consumer protection against restrictive trade practices and monopoly abuses);
- provide for the protection of the marine environment;
- set offences and penalties relating to restrictive trade practices, monopoly abuses, and general matters;
- provide for appeal provisions; and
- provide for marine accident investigation.

798. *Appendix 6.2* contains a synopsis of the proposed Sea Transportation Act.

6.12 Maritime Safety Bill

799. The Maritime Safety Act would provide for Vanuatu's safety and security requirements in line with its obligations as a party to a number of international maritime law instruments, particularly the International Convention for Safety of Life at Sea (SOLAS) 1974, the Convention on the International Regulations for Preventing Collisions at Sea, 1972, and the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978 (STCW). This new Act would, amongst other things, ensure the establishment of a maritime safety administration (as a Directorate of the Ministry of infrastructure and Public Utilities), ensure safety and security regulation of the maritime system in Vanuatu.[69] It would also consolidate existing safety and security laws in Vanuatu. The new Act would make reference to a Maritime Fund to be established by the new Sea Transportation Act.

800. In particular the Act needs to:

- establish the objective of the maritime system (as distinct from the sea transport goal established in the Sea Transportation Act);

[69] As a contracting State to *UNCLOS* Vanuatu is obligated to conform with international safety and security standards and to adopt measures to ensure safety and security by establishing, amongst other things, a flag State and port State oversight capability. The fundamental elements of national safety and security oversight capability are legislation establishing and empowering a maritime administration or authority, and, the promulgation of specific maritime regulations.

- declare the responsibilities of the responsible Minister (Minister of Infrastructure and Public Utilities);
- provide for the power of the Minister to make maritime regulations;
- establish a maritime safety administration to fulfil the responsibilities of a flag State and those of a port State;
- provide for a director of maritime safety with specific powers;
- set out the functions and powers of the director of the maritime safety administration;
- establish a Maritime Register, as distinct from a shipping register, where all appropriate records, documents, *etc* are to be kept and maintained;
- prescribe requirements regarding maritime security and maritime crimes;
- provide for fees and charges;
- set offences and penalties relating to safety, security and general matters; and
- provide for appeal provisions.

801. The Maritime Safety Act could be named the Maritime Safety and Security Act. In this regard it is considered that the term 'safety' also implies security and wherever the term safety is used in *Appendix 6.3*, which is a synopsis of the Maritime Safety Act, security is also implied.

6.13 Ship Registration Bill

802. The purpose of requiring the registration of ships is to enable the government to keep a record of Vanuatu ships that are engaged in the sea transportation system in either foreign or domestic trade for two reasons: one to do with economic development and the other related to Vanuatu's safety responsibilities. The former facilitates the economic, social and environmental well being of the people of Vanuatu. The latter facilities Vanuatu's flag State control responsibilities. Because the objective of the sea transport system is essentially an economic one – to move passengers and cargo efficiently and effectively from one place to another - it is considered that ship registration requirements are likewise essentially economic in nature but with a safety dimension as well.[70]

803. Chapter 131, the Maritime Act, provides for the establishment of a shipping register for vessels of Vanuatu engaged in foreign trade[71] - essentially the 'Convention Ships'.[72] Chapter 53, the Shipping Act, through regulations provides for the registration of domestic ships. Section 6.5 above discusses the main features of CAP 131 with regard to the international ship register and section 6.8.2 elaborates on the current situation.

804. As noted in section 6.6 ship registration requirements for non convention ships or ships that make up the domestic fleet are provided for in Chapter 53, the Shipping Act, and prescribed in the Shipping (Registration of Vessels) Regulations. The regulations require that any vessels carrying passengers for hire or reward or are over 8 metres in length and engaged in commercial activity be registered. There is no mention of ship registration in the Shipping Act.

805. Because ship registration is essentially an economic requirement it could be included in the proposed Sea Transportation Act or, as done in a number of maritime nations, provided for in a separate Act. The point is requirements for ship registration could be equally well catered for as a stand alone Act or incorporated into the Sea Transportation Act.

806. As Vanuatu has an open register then there is merit in a stand alone Act. One influencing factor would be whether the responsible Minister for ship registration is also the Minister responsible

[70] Strictly, in Vanuatu's case, it can be argued that ship registration requirements for its open register are financial and not safety related.
[71] Foreign trade is trade between Vanuatu and a foreign country or between one foreign country and another – Chapter 131 Maritime Act section 1.
[72] The Maritime Act had its origins in 1981 and was drafted to attract ship owners to consider using the Vanuatu open register – at that time the main competition was (and still is) Panama, Liberia and the Bahamas. It is understood that the Vanuatu international shipping register now has over 600 ships on its register and that 50 odd are larger than 1,000 gross registered tonnes.

for sea transportation and maritime affairs. Given the role that ship registration plays in both areas it would be nonsense for there to be two separate responsible Ministers. This is not to suggest that the Minister responsible for any contractual arrangements for the provision of purely administrative services concerned with revenue collection and in support of an open register need be the same Minister, but it would certainly simplify overall governance and oversight arrangements.

807. The requirements for ship registration are reasonably standard throughout the world. *Appendix 6.4* outlines fundamental requirements that should be provided for in a Ship Registration Act. The objective is to provide for seamless transitional arrangements between the provisions of CAP 131, the Maritime Act.

6.14 Safety Oversight and Regulations: some observations

808. This section discusses safety oversight and regulations for both shipping and wharf 0perations with the focus on the domestic sea transport system.

809. In Phase I of the project on the subject of shipping reforms the Final Report noted that:[73]

> … without a proper safety regime private sector operators decide for themselves on what a 'safe' standard is and whether or not to maintain and repair their wharves or slipway.
>
> An appropriate safety regulatory regime for wharf structures and operations (including slipways) is needed to ensure owners operate and maintain them to a safe standard. Such a safety regulatory regime would be the responsibility of the new maritime safety authority. This is a concept similar to that for surveys for the operation and maintenance of ships.

and

> Compliance with and enforcement of safety standards are a serious problem in Vanuatu and have reached a level that is insupportable on the part of both the regulated and the regulator. This must change. The lack of enforcement has mainly arisen through poor governance, management and administration, however, the lack of adequately experienced and trained people has also partly contributed. The low level of compliance is simply a consequence of the lack of enforcement and a generally poor safety culture within the shipping industry. It will take a decade or more to change this once a safety regulator is properly established and functioning.

810. Since the submission of the Phase I Final Report a small licensing unit, under a Principal Licensing Officer has been established within the Department of Ports and Harbours of the MIPU. Its allocated role is "the regulation of the maritime industry and shipping generally in Vanuatu". Although the focus is domestic shipping and CAP 53, the Shipping Act, there remain overall flag and port state responsibilities. With its limited resources the licensing unit has thus focused on domestic shipping and in recent months ensuring that the rules and regulations (safety standards) are complied with. Progress has been made, however, in the wake of the demise of the Vanuatu Maritime Authority that, amongst other things, acted as the safety regulator, access to all documents and information is still denied and the licensing unit is effectively operating on a provisional or transient basis under the authority of a Prime Ministerial letter.[74] The licensing unit has over the last 12 months or so been literally charged with picking up the threads. In the meantime nothing has changed about the poor safety culture within the shipping industry.

811. One of the first tasks of the new maritime safety administration will be to decide on its approach to safety regulation, in particular the setting of safety standards and the drafting of a new set of safety rules or regulations. In doing this for domestic requirements Vanuatu can either establish safety standards afresh, based on the international maritime law instruments it is a party to with appropriate adjustments for domestic maritime system, or it can adopt by reference or incorporation safety standards and associated rules and regulations that have been developed and proven by another State or recognised international body (*e.g.* South Pacific Community's four maritime safety regulations based on IMO formats, the IMO Safety Regulations for Cargo Ships not Covered by IMO Provisions in the Mediterranean Region, the Caribbean Cargo Ship Safety Code that is accepted by the US Coast Guard, *etc*).

[73] Final Report *Vanuatu Inter-island Shipping Study*, McGregor & Company, 27th June 2008: sections 3.1.2 and 3.1.3

[74] Prime Ministerial letter to the Minister of Infrastructure and Public Utilities, 28th December 2007, *Allocation of Responsibility for Maritime Regulation*.

812. The IMO has an active technical cooperation programme that could be engaged to assist Vanuatu develop or adopt a regulatory regime to suit its environment. It is recommended that Vanuatu consult with the Regional Maritime Programme of the South Pacific Community (Suva, Fiji) and also the IMO's Technical Cooperation Committee to assess the most effective and efficient approach to establishing maritime safety standards, rules and regulations for Vanuatu's purposes.

813. The Project Team did not carry out a safety oversight audit. However, in the conduct of Phase II a number of observations were made concerning ship operations and maritime safety. The following sections summarise these observations.

6.14.1 Ship Operations and Safety

814. The level of safety performance in Vanuatu is mainly a reflection of non-compliance, the inadequacy of the safety regulator in being able to ensure compliance and the lack of enforcement.

815. The present rules and regulations are barely adequate and arguably require an industry with a superior safety culture to be functional and effective. For example, and in particular, the safety requirements (standards) for loading and stability plus ship management fall into this category. If the main concerns relating to ship operations and safety performance, and where the risk of an accident or incident are considered to be high, were to be reduced to the three most hazardous then they would be:

- passenger overloading;
- cargo overloading and not monitoring ship stability; and
- inadequate competency of ships' senior personnel for the operations involved.

816. While these are the main concerns or hazards to safe ship operations there are a number of other serious concerns or hazards that are very common in domestic Vanuatu shipping and that have a significant impact on safety performance. These include:

- no or inadequate shipboard systems and procedures (mostly 'no');
- no on-the-job training of junior mates and engineers by their superiors;[75]
- inadequate navigational procedures (both in terms of quality and availability);
- insufficient life saving appliances (both in terms of availability and quality); and
- poor maintenance practices that result in poor ship condition.

6.14.2 Main Concerns

817. Ship safety can be separated into three major topics: human factors, ship operations and ship condition. Safety requirements or standards are set to reduce the risk of accidents and incidents occurring from recognised hazards. Such requirements are usually catered for by a set of maritime safety regulations or rules. Table 6.7 summarises these together with the equivalent NZ Maritime Rule, and a suggested regulatory instrument.[76]

818. The following sections comment on each of the requirements and potential hazards in Table 6.7 and suggest what action could be taken to mitigate the risks of an accident or incident. If the suggested action or similar is taken and promptly then the safety performance of Vanuatu domestic shipping will be significantly improved. If not then fatal and serious injury accidents will continue to occur.

6.14.3 Seafarer Competency & Qualifications

819. Seafarers are adequately taught. Problems are that: some certificates are reportedly issued without the person passing the examination; ships are manned by people without the correct

[75] That is, the new entrants into the industry do not pick up on good practices, because there are none to observe.
[76] There are of course, many other items; these are the ones that are of major concern.

qualifications; there is insufficient oversight for compliance; there is a lack of shipboard use of systems that have been taught. Altogether this is an issue of compliance and enforcement.

820. *Recommendation*: Retain the existing provisions in Part 2 of CAP 53 Shipping along with Schedules 1, 2, 4, 5 and 6, however, the schedules are best incorporated into a regulation rather than an Act. Inspect ships more regularly and rigorously to enforce the requirements. Require owners to recruit from overseas if Vanuatu residents with the correct qualifications are not available (*ie* the regulator should not grant dispensations). By way of comparison people would not contemplate flying in an aircraft flown by an unqualified pilot and the safety regulator does not permit this - passengers lives at risk. A similar situation exists for ships' Masters and engineers.

6.14.4 Ship management procedures

821. In Vanuatu ships are not well operated. Safety procedures are not followed. Contingency plans do not exist. Crew fatigue is not monitored.

822. *Recommendation*: Adopt a new rule that sets out the obligations and duties of the owner and the Master with regard to the operation of a ship. Such requirements could be based on the Safe Ship Management Code contained in NZ Maritime Rule 21, Safe Ship Management (SSM) or a similar rule.

Table 6.13: **Safety Requirements & Standards**

Requirement	NZ Maritime Rule (MR) equivalent	Suggested Vanuatu Maritime Rule
Human Factors		
Competency & qualifications	MR32: Qualifications and Amendments 1 and 2	Existing Part 2, CAP 53, Shipping
Ship Operations		
Ship management procedures	MR 21: Safe Ship management Systems & MR23: Operational Procedures & Training	A new rule, based on the Safe Ship Management Code set out in NZ Maritime Rule 21 Safe Ship Management.
Crewing levels	MR 31B: Crewing and Watchkeeping - Offshore, Coastal and Restricted (Non-Fishing Vessels)	Existing Part 3, CAP 53, Shipping
Safety equipment	MR 42A: Safety Equipment - Lifesaving Appliance Performance Standards & MR42B: Safety Equipment - Fire Appliance Performance Standards	SPC Ship Safety 'Model' Regulations
Navigational equipment	MR45: Navigational Equipment	SPC Ship Safety 'Model' Regulations
Cargo and passenger weight disposition		
Loadline	MR47: Load Lines, & MR 21: Safe Ship Management Systems	SPC Ship Safety 'Model' Regulations plus the proposed procedures for loading and stability.
Intact stability	MR 21: Safe Ship Management Systems	
Ship condition		
Surveys, certification & maintenance	MR46: Maintenance & Surveys	SPC Ship Safety 'Model' Regulations

6.14.5 Crewing levels

823. Crewing levels for near coastal voyages are specified in Part 3 and Schedule 7 to CAP 53, the Shipping Act. Whether or not the manning certificate is complied with is another matter. (Again the Schedule is better placed in the regulations.)

824. *Recommendation*: Retain the existing provisions of Part 3 of Cap 53 Shipping. Inspect ships more regularly and rigorously to enforce the requirements. Require owners to recruit from overseas if Vanuatu residents with the correct qualifications are not available (the regulator should not grant dispensations).

6.14.6 Safety equipment & navigational equipment

825. It would appear that the level of compliance and enforcement to ensure that safety equipment or life saving appliances plus navigation equipment is satisfactory for the operations envisaged is low. However, in recent weeks, since the ferry disasters in Kiribati and Tonga the licensing unit has been ensuring a higher level of compliance.

826. *Recommendation*: Adopt the South Pacific Community's Safety Regulations for Non Convention Vessels with respect to safety and navigational equipment. Inspect ships more regularly and rigorously to ensure compliance with the requirements.

827. In order to promote safety, the safety regulator could issue every ship with a full portfolio of Vanuatu charts on completion of its next survey. At each subsequent survey, replace charts with corrected charts and charging the owner for any missing charts (in order to dissuade the charts being given away). A safety requirement is that a ship must be equipped with navigation equipment appropriate to its operations. It would therefore be an offence for a ship to put to sea without such charts.

6.14.7 Cargo and passenger weight disposition

828. There are instances where ships put to sea either overloaded with cargo and passengers, or in a stability condition that is unsafe or sometimes both. Complying with the approved maximum numbers of passengers and loadline requirements is straightforward, but ship stability is more difficult to assess. It is therefore proposed that a procedure be developed to provide for a simplified stability condition assessment.

829. *Recommendation*: Adopt the South Pacific Community's Safety Regulations for Non Convention Vessels for load line and intact stability, supplemented by a procedure developed specifically to simplify the assessment of stability. Attached at *Appendix 6.5* is a procedure to do this. Inspect ships more regularly and rigorously to ensure compliance with loadline requirements, ship stability and maximum passenger numbers.

6.14.8 Surveys, certification & maintenance

830. Keeping a ship in a seaworthy condition costs money. It also requires the crew to carry out maintenance at daily, weekly and voyage intervals. The ship management procedures set out above can cover the maintenance requirements. The periodic survey becomes the check. Random surveys will also help enforce compliance.

831. *Recommendation:* Adopt the South Pacific Commission's Safety Regulations for Non Convention Vessels with respect to survey, certification and maintenance. Ensure that the survey inspection regime has persons with adequate knowledge to carry it out. Inspect ships on a random basis to help enforce the requirements.

6.14.9 Wharf safety

832. Many wharves and jetties in Vanuatu are in an unsafe condition. Owners do not carry out maintenance, and in due course, the structural integrity of the wharf or jetty deteriorates. In most jurisdictions there is no formal survey carried out by any government agency of the structural condition of a wharf, jetty or slipway or similar. The responsibility for safe operation lies with the owner. In Vanuatu, as in most places, the onus is on that owner to monitor the structural condition, and act appropriately.

833. The evidence is that owners do not act appropriately. As a consequence most wharves and jetties are hazards to people ships, and cargo. Unless wharves, jetties, slipways and other marine infrastructure is maintained in a safe condition then people will be killed or injured and property will be damaged or lost.

834. One way to improve the safety of wharf and shipping operations is to implement a survey regime, similar to that imposed on ships, aircraft, aerodromes and road vehicles. This would firstly enable owners and users (ship owners, passengers, cargo owners, shippers, etc) to be aware of the integrity of marine structures, and secondly allow such structures to be operated under restricted

conditions until repairs are made. Or, ultimately, if the condition of the marine structure warrants it, close the structure until either it is repaired or rehabilitated, or in the worst cases, demolished.

835. New South Wales (NSW) has just such a regime for all ferry wharves in the State, and which could be adopted in principal for Vanuatu. The NSW safety oversight procedure:

- provides suitable criteria and standards for public wharf safety (sets safety standards);
- outlines appropriate inspections and maintenance requirements (functional supervision, sets safety standards); and
- establishes an appropriate methodology for the ongoing compliance of wharves (rules for continued operation).

836. NSW Maritime (the safety regulator) follows this safety oversight procedure when ensuring compliance of public ferry wharves with the safety requirements. Their *Marine Safety Act 1998* provides for NSW Maritime to issue the owner of a public ferry wharf with the following notices:

- an *Improvement Notice* – requiring remedial safety work to be undertaken; and/or
- a *Prohibition Notice* – barring any activity at that wharf that may involve a risk to the health or safety of persons using, or operating ship services.

837. If the risk or non-compliance is deemed to be minor, NSW Maritime may issue a *Defect Advisory Notice* requiring the owner to provide a timetable and strategy for repairs. If the owner fails to comply with this notice, NSW Maritime would then issue a formal *Improvement Notice* or *Prohibition Notice.*

838. If such a safety oversight strategy was introduced in Vanuatu along with a wharf operating certificate that sets out a number of safety standards (requirements) such as:

- wharf operating limitations;
- personnel requirements;
- rescue and fire fighting requirements;
- public protection;
- marine pollution and the marine environment;
- continued compliance;
- wharf maintenance;
- port and wharf emergency plan;
- inspection programme;
- ground vehicles;
- unsafe conditions, audits and inspections;
- wharf security; and
- duration and renewal of certificate

then the risks of accidents and incidents involving death or injury to people as well as damage to or the loss of property would be very much reduced.

Under the Civil Aviation Act and its companion rules and regulations, aerodrome operators are required to have an aerodrome operating certificate that includes the above safety requirements and more. There is no sensible reason why a wharf or port should not have similar safety requirements or rules governing the certification and operation of wharves and port.

7. Institutional Arrangements

Chapter 7 reviews the Government of Vanuatu's institutional arrangements for the management and administration of its obligations and responsibilities for the economic requirements and safety performance of the Vanuatu maritime industry with particular attention to domestic shipping requirements.

The following describes the main features of Vanuatu's current institutional arrangements:

- **the MIPU is involved in regulation (civil aviation and now maritime transport) and service delivery (meteorological services, ports and harbours, national road network, infrastructure development, maintenance and repair);**
- **the MIPU has been resource constrained in its role of developing government policy but now has an office of maritime affairs;**
- **the Department of Ports and Harbours (DPH) has remained largely unchanged since colonial days and today is responsible for providing: safety regulatory oversight to domestic shipping, port state control, port services for international shipping including security, and, the maintenance oversight of marine infrastructure in Vanuatu;**
- **DPH is also responsible for administering the Shipping Act and the Ports Act;**
- **the Ministry of Finance and Economic Management (MFEM) is responsible for the administration the Maritime Act and managing the international shipping register - this nominally includes responsibility for providing Flag State control over ships engaged in international shipping for which the MFEM has neither the capability nor capacity to carry out these responsibilities.**

To meet its international obligations Vanuatu, needs a competent national maritime administration to, amongst other things, fulfil its flag and port state responsibilities, and to ensure that merchant ships comply with international and national or domestic maritime standards as applicable. The national maritime administration needs to be supported by a number of policies, authority and a mandate to ensure that the government's obligations and responsibilities are carried out [refer section 7.9.1]. It is recommended that:

1. **these obligations, responsibilities and duties be split between a maritime safety regulator and the maritime policy unit within the MIPU; [s 7.9.1]**
2. **the safety regulator be called the Maritime Safety Administration of Vanuatu and its early focus be: safety regulation oversight of ship operations, wharf infrastructure safety, seafarer competency and assisting in maintaining the body of law concerning maritime safety matters; [s 7.9.2]**
3. **the Maritime Safety Administration be a directorate of the MIPU in a similar fashion to the Civil Aviation Authority but separate from the proposed Department of Ports and Marine; [s7.9.1 and s7.9.2]**

4. a specialist technical adviser be sought for a period of up to five years to assist in establishing the Maritime Safety Administration and provide advice on such matters as safety and security policy, maritime regulation, safety standards, marine environmental protection, certification (seaworthiness and competency), compliance, enforcement and general maritime industry matters [s7.12.3]; at a cost of about Vt18.6 million per year [table 8.20, chapter 8];

5. the maritime policy unit be the chief policy adviser to the Minister (Government) on all maritime matters – both economic and safety – and be responsible for implementing the Government's economic and sea transport policies and requirements, in particular: administering international law instruments to which Vanuatu is a party, maintaining all Vanuatu maritime law, managing the domestic and international shipping registers, monitoring Vanuatu's sovereignty interests and establishing a Maritime Register, etc; [s 7.9.3] and

6. the Department of Ports and Harbours continue to provide pilotage and berthing services, towage, navigation aids and nautical information plus port security and the department's name be changed to the Department of Ports and Marine. [s 7.10.2]

839. This chapter reviews the institutional requirements of government agencies responsible for shipping and ports with the idea of streamlining policy development, planning, administration and management to improve the safety and economic performance of the maritime system and especially the sea transport system. The emphasis in this phase of the Project is domestic shipping. However, in reviewing both the legal framework and the institutional arrangements that support the Vanuatu maritime system it is impractical to separate international requirements from domestic ones. Therefore the requirements for both needs to be catered for at policy, strategic and institutional levels and will be evident from the discussions in Chapters 6 and 7.

840. This chapter reviews the findings in VISSP1 and makes some observations about policy making, regulation, service provision and the role of the State in safety regulation and oversight. In drawing conclusions about institutional arrangements comments are made about corporatisation and privatisation as well as governance and corruption. Current institutional arrangements within the Vanuatu maritime system are reviewed before examining the main institutional requirements to support the maritime system. Various organisational options are then briefly examined with the objective of determining the most appropriate organisational structure for the Department of Ports and Harbours and the maritime safety regulator. The institutional arrangements surrounding ship registration requirements are also discussed along with the establishment of a Maritime Fund.

7.1 VISSP1 Report & Recommendations

841. In the Phase I report, VISSP1, eight tasks were recommended for inclusion in Phase II, the current Project.[77] These included two tasks [tasks 7 and 8] that dealt with policy, institutional, and legal improvements to "facilitate improved planning, management, safety regulation and service delivery". Phase I suggested that such improvements will need to include consideration of the following tasks:

- the removal of shipping subsidies connected with fuel oil and spare parts, equipment, machinery, etc connected with domestic shipping;
- the sale of the two government-owned ships (using the services of an international ship broking firm);
- the establishment of a small policy unit in the MIPU;

[77] *Vanuatu Inter-island Shipping Study – Phase I*, Final Report, 27th June 2008, McGregor & Company, section 3.7

- a review, updating and streamlining of legislation relating to the safety and economic requirements for maritime, ports and shipping activity, including:
  - a review of responsibilities and the delegations of power to licensing authorities;
  - a safety regulatory regime for wharf structures and operations (*inc* slipways) to ensure they are rehabilitated and maintained to an appropriately safe condition; and
  - the merits of adopting the SPC/IMO "non convention sized ships in the South Pacific" code as a safety standard.
- the establishment of a Vanuatu Maritime Safety Authority as a department within the MIPU;
- a review of the qualification period and on-the-job training requirements for the granting of certificates of competence; and
- the introduction of a practical course on shipping administration and business.

842. In addition the Phase I report included an appendix that briefly reviewed government policy, public sector institutional arrangements, governance, functions and management - see *Appendix 2: Policies, Institutions and Governance* in the final report. It is understood that the GoV accepted all the suggestions except the sale of the two government ships. The monthly charter fees or lease charges for both ships are still not being paid and while the agreement for the lease of the ships expired in May 2008 it is also understood that these are presently being renegotiated for renewal. Nothing has occurred since the submission of the Phase I report to suggest the GoV maintain ownership of these two vessels, rather the way in which these two ships have been operated reinforces the conclusion made in Phase I. Both ships should be sold outright.

843. Apart from suggestions relating to certificates of competency and a practical course on shipping administration and business nothing arose during Phase II to change or modify the other suggestions concerning policy, institutional, and legal improvements. However, a small policy unit was approved by the Public Service Commission in October 2008 including the establishment of a maritime affairs manager. In February 2009 a person was appointed under contract to act as maritime affairs manager and an appointment was made in September 2009. Other policy positions remain vacant.[78] As well a 'Licensing Unit" within the Department of Ports and Harbours was also established late 2008 along with the appointment (under contract) of a Principal Licensing Officer – see paragraph 810– as an interim measure pending the establishment of a maritime safety regulator. Over this same period and following the repeal of the Vanuatu Maritime Authority Act amendments to the Maritime Act and Shipping Act were also drafted and passed awaiting to be gazetted; in this regard additional amendments to these two Acts have also been drafted that altogether have institutional consequences – see sections 6.5 and 6.6 above. These amendments may be held until the legal reforms and requirements described in chapter 5 are implemented.

844. So while there has been progress (improvements) within the MIPU during the past 12 months or so there has been little change at a government policy or macro level within the maritime industry. Thus the observations, analysis and summary of policies, institutions and governance made during VISSP1 remain valid. As noted in paragraph 842 above these are summarized in Appendix 2 of the VISSP1 final report. For the sake of completeness they are reproduced here in full or in part.

7.2 GoV Maritime Policies

845. The main Government policy document appears to be the Comprehensive Reform Program (CRP) that arose out of a national summit eleven years ago in Port Vila. This is updated after each national summit (the last being in 2006) to reflect the emerging priorities and resolutions of the summit; in turn these changes are submitted to the Council of Ministers for approval.

846. The CRP has been around since 1997 and the Priorities and Action Agenda (PAA) since 2003. Over the intervening 10 years it is difficult to judge whether these policy documents have had any impact on inter-island shipping, particularly the CRP. According to ship owners in general, these policies have had little or no impact. The policies do not seem to filter down to individual government departments. Furthermore, comments were made (to the project team) that: "there is a lack of policy

[78] These include: infrastructure policy manager, executive officer, information, communications and technology manager and a secretary to the corporate office.

in all areas of government", "setting policy is not something that is done well", "the Government should be more strategic in its thinking", "political agendas get in the way of public policy", etc.

847. The overall impression (of the project team) is that where policy exists then policy making in Vanuatu tends to be intuitive rather than the result of evidence-based analysis. The process seems to be consultative at a high level but does not seem to reach those levels directly affected and faced with implementing or not the various policies. For example, the Ship Owners Association claims it has been unable to meet with the Minister of Infrastructure and Public Utilities and, furthermore, until this year there has been nobody (with any responsibility for domestic shipping) within that Ministry to discuss their concerns with.

7.2.1 Comprehensive Reform Program (CRP)

848. The overall policy objectives of the CRP are to:

- facilitate the role of the private sector in leading the economy;
- enhance and promote sustainable economic and social development;
- develop and strengthen institutions to support rural development;
- strengthen institutions of governance;
- strengthen public sector reform, the Parliament, and the legal sector; and
- strengthen public sector reform to encompass the Judiciary.

All these are directly relevant to domestic shipping and the economic and social development of remote communities and outer islands.

849. If all these policies are implemented successfully they would improve the performance of inter-island shipping, and the economies of remote communities and outer islands. It is difficult to access the effectiveness and success of the CRP. Its policy objectives are certainly ambitious and require a long time period for implementation that would be an iterative process. Nevertheless the project team is very supportive of the policy for private sector lead economic growth.

850. The state of the domestic shipping industry and marine infrastructure suggests that the maritime sector has been by-passed by the CRP.

7.2.2 Priorities and Action Agenda (PAA)

851. The PAA is an official policy document prepared by the DESP in the Ministry of Finance and Economic Management (MFEM) in June 2006. According to the Foreword in the PAA, the document

> is an integration and prioritisation of the action agendas contained in the already accepted and ongoing national and provincial programs including the CRP, Business Forum Outcomes and the Rural Economic Development Initiatives (REDI) Plans. The overall objective is to link policy and planning with the limited resources the government controls. This will ensure that the most urgent and important outcomes of these programs are achievable in the medium term.

852. The main priority in the PAA is to create an environment for private sector led economic growth, which embraces:

- public sector reform and good governance;
- improving the investment, operating and regulatory environment for the private sector; and
- providing the necessary infrastructure and support services, particularly in rural areas, for the primary sectors and tourism as well as in the urban centres.

853. According to the PAA (section 9.2) the critical issues in marine transport centre on:

- lack of access to capital for ni-Vanuatu wishing to start businesses in the shipping industry, which is perceived as arising from:
  - doubtful viability of many inter-island shipping services as a result of the widely scattered geography; and
  - the vulnerability of assets, and consequent risks of loss, from natural disasters including cyclones.

- (unsatisfactory) operational efficiency which is constrained by outdated design and equipment, which is compounded by poor maintenance; and that
- Port Vila and Luganville wharves serving coastal and inter-island trade are cramped, lack adequate cargo sheds and passenger handling facilities and are poorly maintained.

The project team agrees with the second and third points but not the first.

854. Government policy for marine transport is to develop and maintain Vanuatu's shipping infrastructure so that people, communities and business can effectively participate in national and international trade. The priorities are to:

- maintain and upgrade existing infrastructure;
- improve management of the sector through improved consultation with ship owners and other stakeholders;
- improve operational efficiency in the ports and eliminate subsidies; and
- improve and maintain safety standards through regulatory measures and seafarer training.

855. The study team is in agreement with these policies – they are directly relevant to and supportive of inter-island shipping services. The question is, "has this policy been implemented?" The answer is, "no!", as this report makes clear. The GoV's response to the ideas, suggestions and recommendations of the Phase II report will show whether the GoV is serious about developing and maintaining Vanuatu's shipping infrastructure so that people, communities and business can effectively participate in national and international trade.

7.2.3 Government Policy Overview

856. The various government policies enunciated by the CRP and PAA all sound good. They have been around for a number of years and in the meantime nothing much seems to have happened – including the shipping and ports areas. Policies seem to have not been picked up by individual ministries, their departments and other government agencies. Individual public servants are not well acquainted with them but rather tend to be concerned with "the crisis of the moment". Furthermore the explicit allocation of policy responsibilities from the CRP and PAA to individual ministries seems to be lacking.[79]

857. Thus Government policies seem to have been little more than the outcome of paper exercises. There is no hope of these policies being implemented if only because individual ministries and departments have lacked the funds and human resources to do so. This is certainly the situation with the Ministry of Infrastructure and Public Utilities (MIPU) and the Department of Ports and Harbour (DPH).

858. There is another dimension that interferes with government policy or at least blurs the responsibility for its implementation and also the accountability for any outcome and performance. This is the readiness of the government to enter into long term agreements or concessions that grant significant economic privileges in the form of monopoly arrangements and control to one organisation or another without sufficient safeguards or remedies in place to ensure, let alone enforce, agreed and expected performance. The outcome is that privileges seem to be granted to private sector individuals or organisations with no expectation or guarantee of performance in return. These sorts of arrangements do not enhance the economic and social development of the people of Vanuatu but instead benefit the individuals or organisations concerned.

859. From a domestic shipping perspective the following summarises the policy position:

- Government policy is for economic development to be private sector lead.
- Government's domestic maritime policy is to develop and maintain Vanuatu's shipping infrastructure for Vanuatu to effectively participate in 'national trade' (ie inter-island trade).

[79] Nowhere is a list to be found of Acts and their 'Responsible Ministers", which indicates that it is quite possible individual Ministers may be unaware of their responsibilities and so coordination and consistency of policy at a Ministerial level is lacking, if not dysfunctional.

- The responsibility for implementing this policy seems to have not been allocated to the MIPU but it has neither the manpower nor financial resources to implement it - a situation that appears to have existed for two decades or more.

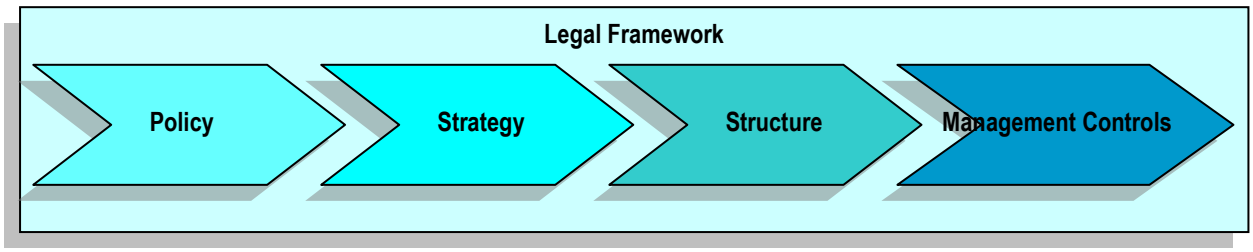
7.2.4 Institutional Strengthening - Governance and Management

860. There is a natural link between policy, strategy, organizational structure and management controls. Once a government and Minister have determined policy, and in this case maritime and shipping policy, the Minister and his or her Ministry will develop strategies to achieve the particular policy objectives. In turn particular institutional arrangements and organizational structures will be needed to support these strategies (*ie* those set out in the Priorities for Action Agenda, which declare Vanuatu's maritime transport policies). With the institutions in place, appropriate management controls will be needed to ensure the various strategies are successful (viz a private sector lead strategy, business model for seaports, public service model for regulators, etc).

861. The key point is: policy determines strategy - strategy determines structure – structure determines management controls. *Figure 7.1* illustrates this relationship.

862. An important ingredient in establishing 'management controls' is an appropriate legal framework that prescribes the various policy objectives, powers, role and functions, institutional arrangements, provisions concerning offences, penalties, financial provisions, *etc*. In other words an appropriate legal framework is needed to support public policy objectives and institutional arrangements. Chapter 5 addresses this requirement.

Figure 7.1: **The Links to Institutional Strengthening**



863. It will be evident, therefore, that if an organization such as a new maritime safety regulator is established in a policy or strategic vacuum or if the legal framework is inadequate or inconsistent with public policy objectives, or policy is contradictory or ignored there will probably be deficiencies in whatever institutional arrangements are decided.[80]

7.3 Government Functions & the Minister

864. In Vanuatu, like in many other countries, public servants do as they are directed and ministers retain all the power and have the last say. The presence of 'political advisers' tightens this power and possibly insulates the minister from advice given by public servants. While public servants are bound to act in the interests of the people of Vanuatu, political advisers work to maintain the power of the minister. These are two different things.

865. Government functions can be categorised as: policy making, regulation, and service delivery. The MIPU is involved in regulation (civil aviation and now maritime transport) and service delivery (meteorological services, ports and harbours, national road network, infrastructure development, maintenance and repair). To date it seems that the MIPU has not had a large role in developing policy.

[80] A common deficiency in the corporate world is for a new chief executive to immediately restructure the organisation before policies and corporate objectives are decided upon or ratified by the board or before appropriate corporate strategies have been developed to achieve those objectives (or both). Restructuring thus takes place in a vacuum. While restructuring gives the appearance that 'something happening', instead the 'wheels are spinning' inevitably resulting in more uncertainty and confusion.

7.3.1 Policy Making

866. Policy advice involves interaction with Ministers. This means that the Minister and his or her official advisers (not political advisers) should have a direct relationship. Therefore there is a need for a small department or unit in a ministry to carry out the research, analysis and planning that is an indispensable part of policy development. The MIPU has been (is) without such a unit and so is handicapped in being able to properly develop sensible policy. The MIPU needs a small policy unit to develop and oversee policy matters concerning infrastructure development and maintenance, inland transport, civil aviation, maritime transport and meteorology.

7.3.2 Regulation

867. Where regulation is concerned the level of involvement of the Minister is a determining factor. If the Minister is the regulatory decision-maker (*i.e.* licensing authority) then there can be no legal separation from the State, which is the case for economic regulation or intervention.[81] In this case it makes sense for the regulatory function to be a government department. Furthermore, a close relationship between the 'policy makers' and the 'regulators' would better enable the government and the Minister to observe the impact and effect of their policies.

868. Where the Minister has little or no real involvement it is desirable for there to be an element of legal separation between the State and the 'Regulator'. This is the case where the Minister is not necessarily the licensing or the approving authority and usually involves regulation by setting standards such as where the safety of human lives is involved. Here a Regulator as an independent entity is usually a more suitable institutional form. However, there are portfolios where public interest and public perceptions demand administration by a Minister (*e.g.* Police, and perhaps Customs and Excise).

869. Regardless of the involvement of the Minister "good regulation" requires openness, transparency, consistency, accountability and independence. Institutional arrangements should foster this.

870. The Vanuatu Maritime Authority (VMA), as the safety regulator, was established as a statutory authority. However, the Act establishing the VMA completely separated the authority from the Responsible Minister. When the governance and management of the VMA became untenable to the Minister (Government) there was little or nothing the Minister could do to take corrective action and so the institution itself had to be disbanded.

871. So before deciding the most appropriate institutional arrangement for the new maritime safety regulator, a policy unit and that of an economic regulator there is a need to consider the role of the Minister in these functions and day-to-day activities. There is also a need to consider the capability and capacity of the industry alongside the history and development of the public sector (especially the public service) plus that of the judicial system.

7.3.3 Role of State in Safety Regulation and Oversight

872. In carrying out its responsibilities under various international maritime law instruments Vanuatu has enacted legislation to provide for the development and promulgation of a code of rules and standards.

873. In developing a code of rules for maritime safety a State may adopt an active role in the implementation of the various rules or it can adopt a passive role. The role a State, or maritime safety regulator, adopts is crucial to the development of a "safe" and orderly maritime system.

874. An *active role* is one where the State will promulgate, in some detail, the rules and regulations that prescribe standards for the safety of maritime operations. Regardless of detail, however, these rules and regulations can never, on their own, provide the operator with comprehensive instructions on which to base an operation. More importantly, an active role is one where the State may adopt a high level of functional supervision characterised by close surveillance and domination of the conduct of operations along with the ongoing provision of support and advice (perhaps on a day-to-day basis) to ensure operators remain within the rules (*i.e.* prescribed operating standards).

875. A *passive role* is the other extreme. In a passive role the State would have limited, even no involvement in the functional supervision of operations. Its role in this case would be limited to

[81] For example, the Minister is the 'licensing authority' for the erection of private installations in ports.

investigatory action and the initiation of legal proceedings when operators broke the rules. In this situation the interpretation and implementation of maritime rules would rely on the competence of the operator and be left entirely to the operator. With a passive role the State effectively relies on the threat of enforcement action for compliance.

876. So, what is the preferred approach to safety regulation and oversight?

877. On the one hand it can be argued that an active role tends to be counter productive for several reasons:

- too detailed rule making may stifle the development of the maritime industry - since rule making usually lags technical and operational development;
- too much detailed checking by maritime safety inspectors may tend to dilute an operator's responsibility for safety in their operation and may not necessarily lead to a high level of safety; and
- detailed and frequent inspections require resources proportional to the amount of activity in the maritime industry - so vast State resources may be required.

878. On the other hand it can be argued that a passive role would lead to abuses in the conduct of maritime operations and at the same time leave very limited means to detect such abuses before an accident occurred.[82] A completely passive regulator will have difficulty in keeping up with technical and operational developments in shipping[83]. Moreover, some operators do not have the capability to consistently interpret and apply rules and standards correctly. So, in the absence of functional supervision, the State would not be able to assess whether rules and standards are being complied with. The State, therefore, would be unable to properly exercise the necessary preventive and correction action and so be unable to fulfil its responsibility.

879. Non compliance is immediately apparent under an active regulatory regime and more difficult to identify in a passive regulatory environment. As a result the cost of corrective action and enforcement under a passive regime is likely to be relatively high because of the amount of investigatory effort needed and the limited or no information that would be otherwise collected and available under an active regime.

880. From a different perspective it can be argued that an abundance of maritime rules and standards, *etc* would enable regulators to escape the need to justify their decisions in cost-benefit terms. (This could be interpreted as a negative or candid view). Similarly, it could be argued that an abundance of rules and standards would safeguard the public interest that would not otherwise be protected. (This could be interpreted as a positive and reasoned view). The truth of the matter is somewhere between these two arguments.

881. So, putting the question again but in a slightly different way - what is an appropriate balance?

882. In many developed maritime countries there has been a trend to adopt a role that is active but system orientated. This is based on the fact that the operator has ultimate responsibility for the safety of his operation.[84]

883. Whether a state adopts a more passive or more active role in the implementation of its responsibilities for maritime safety depends on a number of factors such as the:

- actual balance (or allocation) of responsibility between the State and the operator (ie do operators truly accept and exercise responsibility for the safe conduct of their operations or do operators expect the State to carry some or most of this responsibility);
- perceptions and expectations of operators (and perhaps, too, the public);
- capability of the State;

[82] It is generally argued that legal enforcement against abuses has very limited effect for accident prevention; neither does the threat of enforcement. This seems to be the case in Vanuatu.

[83] In this sense rules and requirements cannot be set once and for all. Rather there must be room for continuing development in an environment of open dialogue between the regulator and the maritime community.

[84] By system orientated we mean the regulator relies more on the overall system safety of an operation than detailed "nuts and bolts". Thus more emphasis is placed on the operators' management capabilities (*viz* quality and safety assurance) rather than on marine inspectors (*viz* quality and safety control).

- capability of the operators;
- State's philosophical approach to public policy and management;
- economic justification (viz cost-benefit) within the State's resources;
- degree to which the State wishes to promote, control or restrict the maritime industry; and
- level of sophistication and maturity of the maritime industry itself.

884. Experience in developed maritime nations suggests that considerable merit exists in an overall State regulatory system which falls between the active and passive extremes and in line with the technological, economic, social and legal environment of the maritime system. Vanuatu does not have a systems orientated approach and its approach seems to be more passive than active simply because of limited resources and a lack of skill and experience within the maritime industry.

885. For Vanuatu the role of the State and its approach to safety regulation and oversight is vital to the development of its maritime industry – both international and domestic. If Vanuatu wishes to be seen as a country that faithfully complies with its international maritime law instruments, is serious about promoting and developing its maritime industry and has ambitions to be one of the leading maritime nations in the Pacific, then it would be well advised to follow the example of the developed maritime nations in the region – Australia and New Zealand, as it has done for civil aviation.[85]

886. In practice because Vanuatu maintains an open international shipping register and operates a maritime college it has no option unless it wants to be seen as a 'rogue' State and black-listed.[86] This would have serious consequences for ships on Vanuatu's open register and for ni Vanuatu seafarers. Vanuatu ships would likely be targeted for Port State control inspections and ni Vanuatu seafarers would be less welcome (maybe unwelcome) as crew on seagoing merchant ships.

7.3.4 Service Provision

887. Where service delivery is the main function then State-owned enterprises can be a suitable institutional form for the organisation provided there are no constitutional issues that would prevent it (*e.g.* Defence, Foreign Affairs). Following the rash of corporatizations and privatisations that were set up in the developed economies in Europe and in turn New Zealand and Australia about 15 to 20 years ago it has been very 'fashionable' for governments to corporatize its trading or service provision entities such as sea ports, airports and other public utilities. Airports Vanuatu Limited is an example of a purely service provision State-owned enterprise.

888. The DPH's main function is the delivery of ports and harbours facilities and services and the question arises whether it should be corporatized into a government non public service entity or even privatised. The answer to this is that while the DPH could be corporatized or even privatised, experience in Vanuatu indicates this would be inappropriate and could possibly lead to the further degradation of the DPH's main functions. The next two sections elaborate on this matter.

7.4 Corporatisation or Privatisation

889. Within the Vanuatu maritime industry there has been and is talk and support for corporatizing the DPH. Airports Vanuatu Limited is given as an example. In some sectors of the maritime industry there is also interest in privatising the ports and all its operations. For international ports the GoV is the owner (landlord) and the private sector is the operator. For domestic ports, as noted in chapters 2 and 5 wharves are both publicly and privately owned. The advantages and disadvantages of corporatisation and privatisation are not often well appreciated. The following paragraphs outlines experience in these matters in various places around the world.

[85] Vanuatu's approach to safety regulation will have a direct bearing on the success or otherwise of the Vanuatu Maritime College and the international reputation of ni Vanuatu seafarers trained at the college. In particular Vanuatu's adoption and compliance with STCW 95 that sets qualification standards for masters, officers and watch keeping seafarers on seagoing merchant ships is one of the international maritime law instruments that along with its compliance with SOLAS 74, MARPOL 73/78 and LL 66, shape Vanuatu's international reputation.

[86] The IMO maintains a so-called "White List" of countries that are considered by the IMO's Maritime Safety Committee to give "full and complete effect" to STCW 95. There are 71 countries on the "White List" including Fiji, Kiribati, Marshall Islands, PNG, Samoa, Tonga, Tuvalu, Vanuatu, Australia and New Zealand.

890. There is a difference in the institutional arrangements for airports and seaports in Europe and those in North America. Essentially airports and seaports in North America are seen as public utilities that have a role to play in the economic and social development of the region they serve. For seaports the public utility role is often exercised and promoted by way of a landlord function with management and operations being a private sector activity. For airports the public utility role can include management and operations. Whereas in Europe airports and seaports tend to be seen as just another economic activity, not unlike an airline or shipping company, that should be freed from the shackles of government management and control, regardless of its natural monopoly. Notwithstanding this, however, where the general perception in the US is that airports, for example, are not-for-profit public utilities, there has been one privatization development that has been successful and welcomed by the airlines in particular. That is the contracting out of the management of Terminal 4 at JFK International Airport, which is owned by the Port Authority of New York and New Jersey.[87] This is the exception in North America.

891. In small countries in the Pacific seaports tend to be owned and operated by the state.

892. In Europe the unshackling process has evolved in two stages. First corporatization followed by a possible privatisation. The declared motivation for corporatization has been to improve the efficiency and effectiveness of an airport or seaport by lowering costs and improving service. This was naturally welcomed by the airlines, passengers, shipping companies and cargo interests. The declared motivation for privatisation has not been so clear cut. Reasons for privatising airports and seaports included: less bureaucracy and more cost consciousness, to raise cash for their government owners, gain efficiency by exposure to 'the market', to gain access to capital markets, *etc*. It was also claimed that privatised airports and seaports would be managed on a fully commercial basis but it was not stated just what that would mean. The consequences were not foreseen. In Europe, New Zealand and Australia there have been a number of examples where privatisation has been accompanied by spectacular failure. In New Zealand some seaports have been successfully but partially privatised as have airports. In both cases the public sector remains a significant or majority shareholder.

893. The air transport markets best illustrates the privatisation debate that in some cases are also relevant to the sea transport markets.

894. Today the benefits to airlines and passengers are hotly debated. There is sufficient evidence to support the view held by the majority of the airlines that costs have not been reduced and that airports have not become more cost conscious. Furthermore, there appears to be less inclination on the part of governments to impartially regulate these natural monopolies. Airlines operate in a very competitive market against a number of other airlines, have little control over their largest costs (fuel), and sometimes do not always have the power to set prices. Airports do not face the same market conditions and often have the sole 'franchise' for the main point of entry to a country, region or city.

895. In short airlines are not enamoured with privatised airports or airports owned and operated under some sort of private-public-partnership. They contend that privatisation of airports has resulted in two tranches of price increases. The first increase when the airport is corporatized and being prepared for privatisation in order to enhance the attractiveness of the airport as an investment. The easiest way of increasing revenue is to increase airport charges. The privatisation process usually awards the airport to the highest bidder in one form or another. The successful bidder sometimes over-bids (the airlines would argue 'always'). In turn, to recover the cost of their investment the new owners increase airport charges, again. Furthermore, where the regulator (*ie* Government) maintains an ownership interest or receives some franchise income and the airport has a natural monopoly there is little inclination to regulate prices. Evidence for airline concerns rests with the very high earnings before interest, tax, depreciation and amortization (EBITDA) ratio of up to 78% and pre-tax margins of 48%, whereas airlines are lucky to achieve a pre-tax margin of 10% in good years.

896. The counter arguments are by comparison slim. Privatisation is usually accompanied by an extensive investment or capital expenditure programme to increase airport capacity. This makes a comparison of before and after privatisation arguments difficult. Price increases are, it is claimed, only part of the increased pre-tax margins - cost control and productivity increases contribute as well.

[87] A private consortium, including Schiphol, the main international airport in the Netherlands, has a 50 year lease to develop and manage the terminal with the ability to charge airlines fees and generate revenue from passenger-related (shopping) concessions from the almost 8 million passengers using the terminal annually.

897. Private owners of airports seek to get a return on their investment that might be typically 7% to 12% - so, the greater the investment the greater the cash return. In this regard airlines argue that, unlike seaports, airports do not consistently consult on future capital investment expenditure where some upgrading has gone too far and capacity increases unjustified.

898. Overall it is fair to say that considerable tension exits between airlines and airports and that this tension is greatest where airports have been privatised in one form or another.

899. This type of tension can also exist between shipping companies, especially cruise lines, and seaports, regardless of port ownership. It exists for Port Vila, where the port has a reputation for the highest price and lowest productivity in the Pacific for international shipping.[88] In Port Vila the international wharf is owned by the government but a private entity (Ifira Wharf and Stevedoring (1994) Limited) has a 50 year concession to manage all wharf operations. The conventional motivation and reasons for corporatisation and privatisation do not apply in Vanuatu. The answer to increased effectiveness and efficiency lies in competition and not ownership.[89]

7.5 Governance and Corruption

900. The shipping industry in Vanuatu involves a wide spectrum of government involvement even though the provision of domestic shipping services is dominated by the private sector. The government's involvement includes: economic regulation, safety regulation, ports and harbours, foreshore development, navigation aids, environmental matters, *etc*. There is also an international dimension to some of Vanuatu's transport and trading activities, notably the Vanuatu international shipping register.

901. Allegations of corruption and malfeasance have characterised some aspects of transport and trading in Vanuatu. A report by *Transparency International Vanuatu, National Integrity Systems – Country Study Report Vanuatu Update 2006*, outlines Vanuatu's corruption profile. It states that:

> Statutory bodies such as the Vanuatu Maritime Authority (VMA) and the Vanuatu Commodities Marketing Board (VCMB) are generally perceived to be corrupt institutions and subject to political interference.
>
> Land is a major issue in Vanuatu and allegations of corruption in dealings with land (and foreshores) are widespread both at the ministerial level … as well as at the land owners' level….Private sector land developers … are often perceived to be fuelling corruption in land dealings.
>
> Politicians who have had quite damning Ombudsman's reports published about their behaviour continue to get elected.

902. The alleged corruption and misconduct surrounding the VMA was acted upon by the Government in December 2007 by shutting it down and the VMA's activities in this regard are still being investigated.

903. The VCMB has been criticised for failing to carry out its regulatory functions, the lack of audited accounts over a number of years (8 or 9), being technically insolvent, consistently accumulating huge losses, unaccounted for bank accounts plus government and donor grants. Furthermore there seems to be a reluctance on the part of the responsible Minister to use the powers at his disposal.

904. The Leadership Code Act (CAP 240) was introduced in 1998 to give effect to Chapter 10 of the Constitution governing the conduct of the leaders of the people of Vanuatu. The term "leaders" is wide ranging and includes politicians, nominated or appointed officials and public servants, all of whom have a position of influence and authority within a community. The Code requires a 'leader' to be fair, honest, avoid personal gain, avoid bringing his or her office into disrepute, and to be familiar with and understand the laws affecting his or her role and function. It is understood that a 'leader' has yet to be found guilty of a breach of the Leadership Code.

905. The Government Contracts and Tenders Act (CAP 245) requires that all qualifying government contracts use a competitive and transparent process.

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[88] Oceanic Voyages – shipping in the Pacific, ADB 2007, page 28, figure 1 and page 30 figure 2. *Pacific Economic Survey 2008 – connecting the region*, AusAID March 2008, page 74, figure 6.2

[89] A private monopoly is not necessarily more efficient and effective than a public one.

906. The 2002 Ombudsman's report into the granting of a Government contract to Ifira Wharf and Stevedoring (1994) Limited in 2000 is heavily critical of the process and way in which the contract was extended for 15 years. More recently this same contract was extended for a further 35 years, which provides the exclusive use of the so-called Port Vila (Government) wharf and Port Vila foreshore up to 2050 but with obligations to develop additional wharf capacity. It has been criticised as not being done in accordance with CAP 245.

907. It is evident that in Vanuatu the governance and management of statutory authorities have been susceptible to serious levels of corruption. Official misconduct also seems to be a trait in some government dealings in the maritime industry. Furthermore, any activity that involves international trade or international treaties (*viz* maritime conventions, civil aviation conventions, *etc*) is perhaps especially vulnerable to corruption.

7.6 Institutional Conclusions

908. For the reasons outlined in section 7.5 above the maritime safety regulator should be established as a department within the MIPU.

909. The establishment of a statutory ports authority or a ports company would be likewise especially susceptible to serious levels of corruption – the DPH should therefore remain a department within the MIPU.

910. The safety regulator and DPH are relatively small organisations in terms of people and other resources. So establishing them as separate entities would merely increase the cost and complexity of governance and management for no gain but at potentially risk of malfeasance.

7.7 Government's Maritime Roles & Functions

911. There are a number of activities necessary for the achievement of the objectives of the maritime and sea transport systems. The government has obligations and responsibilities for a number of these activities:

- providing port services and facilities for international sea transport and trade at Port Vila and Luganville that includes pilotage, provision and maintenance of wharf facilities and navigation aids, etc – this is the responsibility of the Department of Ports and Harbours;
- ensuring the provisions of wharf operations and stevedoring at international ports where the government has contractual agreements for their provision - this is the responsibility of the Department of Ports and Harbours;
- providing and maintaining wharf and jetty facilities in the outer islands - this seems to be the responsibility of the Ministry of Infrastructure and Public Utilities and provincial governments;
- maintaining and upgrading of the maritime infrastructure in general (as stated in the PAA – paragraph 854 above) – this is the responsibility of the Ministry of Infrastructure and Public Utilities;
- providing Flag State control and Port State control over merchant ships engaged in international commerce – this is the responsibility of the maritime safety regulator;
- setting safety standards and providing safety oversight of all domestic maritime operations - this is currently the responsibility of the Department of Ports and Harbours;
- providing nautical information - this is probably the responsibility of the Department of Ports and Harbours;
- providing port security for international shipping - this is the responsibility of the Department of Ports and Harbours;
- safeguarding Vanuatu territorial waters in their fullest extent - this responsibility appears not to have been allocated to any government ministry or department but is arguably the responsibility of the Ministry of Foreign Affairs or Internal Affairs;

- providing maritime search and rescue - this is the responsibility of the Ministry of Internal Affairs, Police Maritime Wing;
- providing and administering the international shipping register - this is the responsibility of the Ministry of Finance and Economic Management;
- providing services and facilities to protect the marine environment and deal with oil spills and other marine pollution – this has not been allocated to any government ministry or department but is arguably the responsibility of the Ministry of Infrastructure and Public Utilities; and
- administering international maritime law instruments that Vanuatu is a party to – there has been no attention given to this function but it seems to be the responsibility of the Ministry of Infrastructure and Public Utilities or the Ministry of Finance and Economic Management; it is likely that both the State Law Office and Ministry of Foreign Affairs also become involved.

912. *Flag State* refers to the authority under which a country exercises regulatory control over the commercial vessel which is registered under its flag. *Flag State Control* is the process of ensuring that national (Vanuatu) flag vessels meet both national regulations and, for vessels on international voyages, the appropriate international maritime law instruments the nation (Vanuatu) is a party to. It is also the process for taking all reasonable steps necessary to give full and complete effect to these instruments and to ensure that a national (Vanuatu) ship is fit for the purpose and complies with standards to protect the safety of life and to protect the marine environment.

913. Flag State Control is achieved by inspections made by national (Vanuatu) maritime safety inspectors or by qualified organizations or individuals in accordance with appropriate delegations of authority by the national (Vanuatu) maritime safety regulator to the organization or individual. This is a delegation of *authority* (to carry out on behalf of the State for what are properly State functions) not a delegation of *responsibility*. So the national (Vanuatu) maritime safety regulator retains at least a duty of care to ensure overall compliance. Therefore the maritime safety regulator still needs to check organizations or individuals with such delegations of authority to ensure that the delegations are being properly exercised.

914. *Port State* refers to that authority under which a country exercises regulatory control over the commercial vessel which is registered under another country's flag. This authority only exists while those vessels are operating within that country's territorial waters. Territorial waters extend out to 12 miles (22.2 km). *Port State Control* (PSC) is the inspection of foreign ships in other national ports to verify the competency of the master and officers onboard, that the condition of a ship and its equipment comply with the requirements of international conventions (viz SOLAS, MARPOL, STCW, *etc*) and that the vessel is manned and operated in compliance with applicable international law.

915. To a greater or lesser extent these activities are carried out except for the protection of the marine environment. Most of these activities, however, appear to be carried out to a 'lesser extent' and those that are not are hampered by inadequate resources, both funds and people. For some of these activities the government contracts for the provision of these services. The administration and promotion of the Vanuatu international shipping register is contracted to Vanuatu Maritime Services Limited. The provision of international wharf operations and stevedoring services is, as noted above, contracted to Ifira Wharf and Stevedoring (1994) Limited in Port Vila and NISCOL in Luganville.

916. Considerable revenue is earned by the government in providing some maritime facilities and services. Section 6.8.1 details the revenue earned over the last five years by the Department of Ports and Harbours and the three relevant paragraphs are repeated below:

> 760. The direct revenue the GoV receives from the Vanuatu sea transport system, apart from indirect customs taxes or similar, is considerable. *Table 6.11* summarises the revenue collected by the department of Ports and Harbours in connection with international shipping between 2005 and 2008. The figure for 2009 is taken from the GoV 2009 Budget Volume 1 Fiscal Strategy Report and it seems the Vt 180 million revenue figure is likely to be conservative. The Department of Ports and Harbours is one of the GoV's higher revenue earners.

Table 6.11: **Department of Ports & Harbours Revenue**

Units: Vt millions	2005	2006	2007	2008	2009
Pilotage	22.2	46.2	63.1	63.1	40.0
Line handling, storage	18.6	12.3	14.7	34.3	30.0
Berthage	37.8	80.9	106.5	120.0	90.0
Wharfage	94.5	43.8	35.0	28.8	25.0
Total revenue	**173.1**	**183.2**	**219.2**	**246.1**	**185.0**

761. By contrast the fees earned from the Vanuatu international shipping register are expected to be 40 million Vt in 2009, according to the 2009 Budget – that equates to the revenue earned from pilotage services and about 22% of the total revenue budgeted for by the Department of Ports and Harbours.

762. Overall, government fees and charges relating to the sea transport system are an important part of their economic requirements. The responsible Minister has the delegated power to establish these charges. In turn the services and facilities they relate to need to be properly managed and operated; this includes stevedoring and related wharf operations that are mostly provided for under long term concessions. Arguably this is not currently the case. Economic requirements placed on the sea transport system, especially the ports subsystem would enable Vanuatu to promote efficiency and competition within these markets.

917. Port charges and fees levied by the Department of Ports and Harbours contribute to Port Vila's place and reputation as the most expensive and inefficient ports in the Pacific. However, the DPH charges are not unreasonable.

918. The following sections outline the current organisational arrangements for the Department of Ports and Harbours, Ministry of Infrastructure and Public Utilities and for the administration of the international shipping register.

7.8 Institutional Arrangements

7.8.1 Service Provision

919. The provision of piloting services, navigation aids, nautical information, port security, wharf operations and stevedoring at international ports currently reside with the Department of Ports and Harbours - wharf operations and stevedoring at international ports is provided under contract.

920. The provision and maintenance of the maritime infrastructure currently resides with Public Works Department. Provincial governments may also be involved.

921. The provision of ship registration services for international shipping is currently provided by Vanuatu Maritime Services Limited notionally under the (minimum) oversight of the Ministry of Finance and Economic Management (MFEM). Domestic ship registration services are now provided by a small unit headed by the Principal Licensing Officer within the Department of Ports and Harbours.

7.8.2 Regulation and Market Intervention

922. Safety regulation is presently provided by a small unit headed by the Principal Licensing Officer that was set up within the Department of Ports and Harbours late 2008.

923. Economic regulation of the sea transport markets, including ports, is partly but inadequately provided by the Department of Ports and Harbours (*e.g.* monitoring of government contracts). Aspects of the economic regulation of the sea transport markets are also provided by departments within the Ministry of Finance and Economic Management, including the matter of subsidies.

7.8.3 Government Policy

924. Maritime policy advice to the Minister (Government) was provided by the now disbanded Vanuatu Maritime Authority. Since its demise some maritime policy advice is provided by a committee within the MFEM referred to as the Maritime Technical Advisory Committee. It consists of selected individuals representing the Government (four members) plus one from the industry. Presently its members are: Vanuatu Ambassador to the European Union resident in Brussels, Director General of Finance, a representative of the State Law Office, Director of Fisheries, and a ni

Vanuatu businessman involved in the fishing industry and who was the closing chairman of the Vanuatu Maritime Authority. It is understood that the advisory committee meets infrequently and on an *ad hoc* basis. It is also understood that its main task is to assist the Minister (of Finance) administer CAP 131, the Maritime Act, and manage the international shipping register. VMSL therefore notionally reports to this committee as there is no longer a Commissioner of Maritime Affairs. The Ministry of Infrastructure of Public Utilities is not involved, even in an observer capacity.

925. Maritime policy advice is also provided to the Government through the Minister of Infrastructure of Public Utilities by the Director General of MIPU and the Department of Ports and Harbours. This seems to have been limited to matters concerning domestic shipping, ports and harbours. However, since the appointment of a maritime affairs manager this advice has broadened but remains separate from that of the Maritime Technical Advisory Committee.

926. It seems that policy development and advice is presently ad hoc, uncoordinated and probably dysfunctional. The formation of a Maritime Technical Advisory Committee is obviously a temporary arrangement pending the establishment of, amongst other things, a maritime safety regulator and a review of institutional arrangements concerning the international shipping register.

7.8.4 MIPU

927. In Phase I it was suggested that a policy unit be established – refer paragraph 843 above. This has been implemented with the establishment in October 2008 of a number of positions to this effect. The positions have been established within the 'Office of the Director General' and each position reports directly to the director General. As noted a maritime affairs manager has been appointed, first on contract in February 2009 and then as a permanent position in September 2009. Other positions established but yet to be filled are:

- infrastructure policy manager: to coordinate the development and implementation of government policies for infrastructure
- executive officer: to provide efficient and effective support services to the director general and directors
- information communications and technology manager: to plan, manage and coordinate Government ICT policies and the Ministry's ICT requirements and to implement Government ICT technical requirements; and
- secretary: to provide executive assistance and secretarial support to the office of the director general.

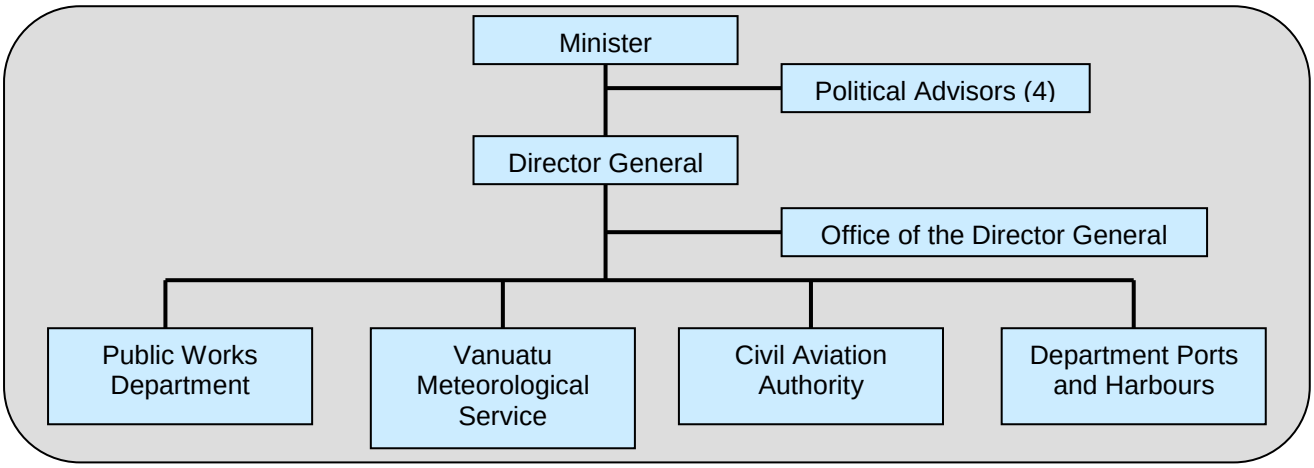
928. The stated purpose of the maritime affairs manager is to manage and oversee maritime affairs and provide policy advice.

929. While the role and functions (referred to as duties and responsibilities) are spelt out in the job description approved by the Public Service Commission further consideration of their specific role and function for each of these four positions is needed. This has been done for the maritime affairs manager.

930. The office of the director general also includes a finance manager, human resources manager and a senior human resources officer. These positions have been occupied for some time. The purpose or role of the finance manager is to manage the budgeting process, cash flow and financial reporting.[90] The purpose or role of the human resources appointments is to provide an effective and efficient human resources function including the management of the payroll. *Figure 7.2* illustrates the organisational structure of the MIPU.

[90] The Public Service Commission job description for the finance manager repeats the job purpose for the human resources manager and requires correction.

Figure 7.2: **Organisational Structure of the MIPU**



931. There are four departments each headed by a director:

- *Public Works Department*: responsible for the national road network and infrastructure throughout Vanuatu, its building and maintenance
- *Civil Aviation Authority and Department of Civil Aviation*: responsible for the safety and security regulation of civil aviation
- *Vanuatu Meteorological Service*: responsible for the provision of meteorological services for Vanuatu; and
- *Department of Ports and Harbours*: responsible for the administration and management of two ports and harbours (Port Vila and Luganville) and supposedly also for flag state control and port state control.

932. As remarked in the Phase I report the most extraordinary feature of the organisational structure is the number and presence of political advisors (now four and so one less than in 2008). The project team has not assessed the role and functions of these advisers in terms of the MIPU's role, functions and responsibilities.

7.8.5 Current Department of Ports & Harbours

933. It is understood that the organisation of the Department of Ports and Harbours (DPH) has remained largely unchanged since (British) colonial days and when the harbourmaster(s) and director were expatriates. It is also understood that in those days the department was referred to as the Department of Ports and Marine. This partly explains the unwieldy organisational structure of the department today when the department carried out anything and all to do with shipping, ports, harbours, navigation aids, etc – it was a provider of services, including shipping services, and also the safety regulator. The extent and substance of its safety regulatory role is not known but it can be reliably concluded that the then Department of Ports and Marine carried out traditional safety oversight of that time – surveying ships, (limited) seafarer competency, and port operations – existing ports and shipping legislation supports this conclusion. A feature of 'colonial days' and the British system was the importance of the harbourmaster who was the principal maritime officer placed in charge of everything nautical.

934. With the introduction of the ISPS code in 2006 port security responsibilities were added to the DPH. These responsibilities were placed under the harbourmaster who effectively assumed the role of port security officer. An establishment of 18 security personnel within the DPH was approved by the Public Service Commission to comply with the ISPS code.

935. With the disbanding of the Vanuatu Maritime Authority in December 2007 the DPH was allocated the responsibility for administering the CAP 53, the Shipping Act, and late 2008 a Principal Licensing Officer's unit was established within the DPH. This arrangement returned the DPH to the roles it carried out prior to the establishment of the Vanuatu Maritime Authority in 1998.

936. The DPH is responsible for the following functions:

- administering CAP 26, the Ports Act;
- administering CAP 53, the Shipping Act;
- providing Flag State control of the domestic fleet;
- providing Port State control;
- administering and maintaining the domestic shipping register;
- providing advice on all port related development;
- providing pilotage and berthage services at Port Vila and Luganville for international ships;
- providing safe and efficient port services for international ships;
- monitoring and managing the contractual arrangements for the provision of wharf operations and stevedoring services;
- providing safety oversight for "all declared ports in Vanuatu";
- providing port security at Port Vila and Luganville in compliance with the ISPS code;
- managing repair and maintenance of port and marine infrastructure (including navigation aids); and
- billing and collecting revenue from port charges and related fees.

The responsibility for providing Flag State control over ships engaged in international shipping is nominally allocated to the MFEM; however, it has neither the capability nor capacity (nor inclination) to adequately administer these responsibilities. It is understood that Vanuatu Maritime Services Limited, who administer the international shipping register, provide some Flag State control functions.

937. There is also an expectation of providing towage services once a tug is acquired. These functions are presently provided to a greater or lesser extent. Again, apart from pilotage, berthage and port security most of the above functions are provided to a lesser extent or not at all. There seem to be a variety of reasons for this ranging from inadequate or unsatisfactory leadership, management and control to the lack of resources. In most areas it seems to be more a matter of capacity than capability except for leadership and management.

938. The revenue in connection with international shipping is considerable. This is first commented upon in chapter 5 and summarised in *Table 6.10*, and is repeated in paragraph 916 above. *Table 7.3* summarises revenue and expenditure for the four years 2005 – 08, which on average is the equivalent of about USD 1.2 million per year over the last five years, which is exceeded only by: revenue from customs and excise, rates and taxes, land registration fees, the Reserve Bank and revenue from fishing licenses.

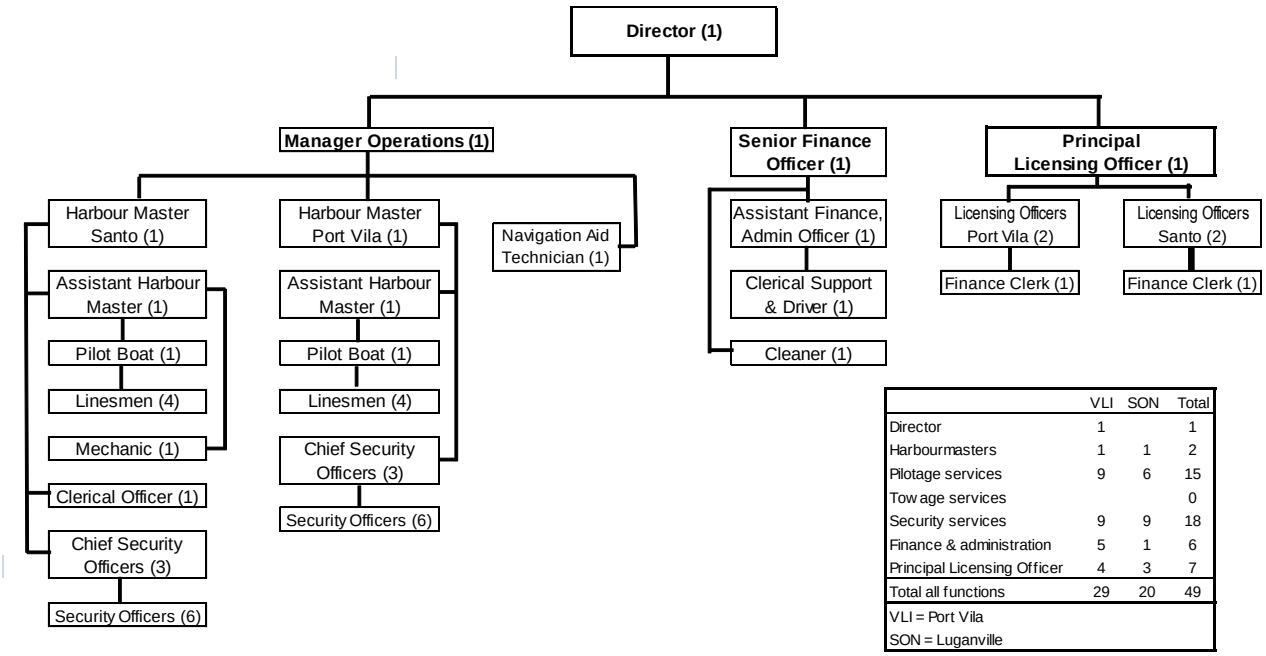
Table 7.3: **DPH Revenue & Expenditure**

Units: Vatu	*2005*	*2006*	*2007*	*2008*
Revenue	173,110,996	183,221,000	219,173,637	235,652,309
Expenditure				
Personnel	22,776,673	36,261,395	49,614,268	42,738,057
Operations	29,430,380	25,185,228	33,276,334	91,091,436
Total expenditure	52,207,053	61,446,623	82,890,602	133,829,493
Surplus	120,903,943	121,774,377	136,283,035	101,822,816

939. The current organisational structure of the DPH is unwieldy and confusing but it is apparent that its focus is international ports and shipping, apart from the Principal Licensing Officer's unit. At the very least the lines of responsibility are not clear. One of the main points of confusion is the role and functions of the operations manager and the relationship between the operations manager and the harbourmasters; and, in turn their relationship with other people within the DPH. Two organisation

charts have been approved by the Public Service Commission (PSC): in July 2006 that included the provision for port security services, and in December 2008 that included the provision for the Principal Licensing Officer's unit.[91] However, between the two there are other differences and there are also differences between these charts and the PSC approved job descriptions. The organisation chart in *Figure 7.4* is an interpretation based on the two charts, job descriptions and personal discussions with DPH staff.[92]

Figure 7.4: **Department of Ports and Harbours**



	VLI	SON	Total
Director	1		1
Harbourmasters	1	1	2
Pilotage services	9	6	15
Towage services			0
Security services	9	9	18
Finance & administration	5	1	6
Principal Licensing Officer	4	3	7
Total all functions	29	20	49

VLI = Port Vila
SON = Luganville

940. The PSC organisation chart suggests that the Principal Licensing Officer (PLO) reports to the Operations Manager. A job description for the PLO was not available and the Operations Manager's job description has not been updated since the PLO unit was established. Regardless, it would be nonsense for the PLO to report to the Operations Manager, especially in consideration of the delegated powers the PLO has as the safety regulator and as the licensing authority for safety regulation. Furthermore, in the context of CAP 26, the Ports Act, it is also nonsense for the Harbourmasters to report to the Operations Manager. Just why they apparently report to the Operations Manager is not clear and no explanation has been given.[93] If, however, the Senior Finance Manager and the PLO are intended to report to the Operations Manager then the question arises as to why a one-on-one relationship exists between the Director and the Operations Manager? There seems to be some uncertainty within the DPH as to reporting relationships, and if there is no uncertainty then there appears to be some confusion, at least. The need to maintain two offices, one in Port Vila and the other in Luganville, requires good communications between the two locations.

[91] The copies of the PSC approved organisation charts were not easily read or followed but sufficient for Phase II purposes.

[92] For example, according to the job description, the Assistant Harbourmaster Vila reports to the "Harbourmaster/Director"; the Shipwright/Welder reports to the Manager Operations/Harbourmaster; linesmen report to the Pilot Boat Boson or Wharf Supervisor; the Seaman- Vila reports to the Boson or Leading Seaman; the Tug Engineer reports to the Operations Manger rather than the Tug Master, whereas the Tug Master reports to the Harbourmaster. Furthermore the 2006 Job Description for the Senior Finance Manager states that the job reports to the Operations Manager and yet the 2006 organisation chart shows the Senior Finance Officer reports to the Director while the 2008 chart shows the Senior Finance Officer reports to the Operations Manager. The Operations Manager's job description states that the duties include that of Deputy Director and Acting Director in the absence of the Director yet in the absence of the Director (suspended) the Director of Meteorology was appointed Acting Director DPH and in the subsequence absence of the Director of Meteorology the Senior Finance Manager was appointed Acting Director as she was in 2008 in the absence of the Director DPH. The point is current organisation charts and job descriptions are misleading and in one way or another inaccurate.

[93] There is an oblique or implied reference to the Harbourmasters in the Operations Manager's job description in duty and responsibility 7.8, managing 'the whole operation of the Department. Otherwise it is silent.

The effectiveness of DPH's communications system has not been tested or inspected but based on what amounts to a dysfunctional organisational structure and limited resources internal communications can only be inadequate at best.

941. According to the PSC establishment the DPH is established for 56 positions, including the PLO unit and provision for a tug based at Port Vila. The present (Q3/09) manning is only 38, which includes five in the POL unit. The tangible establishment, however, seems to be 48 against which the present manning should be measured. One of the difficulties has been to precisely determine what the actual establishment for the DPH is and the actual manning. This is partly because the organisation charts, job descriptions and the established appointments are not easily reconcilable.

942. In conclusion the organisational structure of the DPH is unwieldy and confusing. During the past two years or so it has lacked leadership at a time when its role and functions have expanded by assuming the role of safety regulator after a period of some regulator uncertainty (which continues) and with limited resources. In recent years the focus of its operations has been international shipping, with its safety regulatory role a domestic dimension has now been added to its scope of attention.

943. The department will benefit from a complete review and reassessment of its role, functions and structure. This is one of the tasks of Phase II.

7.8.6 International Shipping Register

944. Vanuatu established an international shipping register in 1981 in parallel with the introduction of the Maritime Act, CAP 131, the purpose of which was (is) "To provide for the establishment of a shipping register for vessels of Vanuatu engaged in foreign trade and for matters connected therewith." It was established as a revenue earner for the Government of Vanuatu and so falls within the transport or economic requirements Vanuatu's sea transport system. This is discussed in section 6.8.2.

945. CAP 131 provides for a *Maritime Administrator* to be appointed by the Vanuatu Maritime Authority but is silent about the role and functions of the Administrator other than that the terms and conditions are left open to the Authority. The indication is that the Maritime Administrator would administrate the international shipping register on behalf of the Shipping Registrar. CAP 131 also refers to the *Commissioner of Maritime Affairs* appointed by the Vanuatu Maritime Authority, who had extensive powers covering most functions in the Act, in particular to delegate authority and to appoint individuals (and organisations) to undertake various and general tasks (*e.g.* special agents). The Commissioner of Maritime Affairs appears to be or act as the Registrar of Ships. Currently a Commissioner does not exist.

946. It is understood that when the Vanuatu international shipping register was originally set up the Commissioner of Maritime Affairs belonged to or headed a department of the new Ministry of Finance and Economic Management that was also responsible for the Registrar of Companies, Collector of Stamp Duties and the Banking Commissioner. When the Vanuatu Financial Services Commission (VFSC) Act, CAP 229, was enacted in 1993 it is understood that the Vanuatu Financial Services Commissioner took on the role of the Commissioner of Maritime Affairs. Then in 1999 when the Vanuatu Maritime Authority was established with the enactment of the Vanuatu Maritime Authority Act 1998, the Authority was empowered to appoint the Commissioner of Maritime Affairs.

947. In 1981 Vanuatu Maritime Services Inc (VMSI) entered into a contract with the Ministry of Finance and Economic Management (MFEM) to set up and administer an international shipping register for a period of 10 years plus one more year, from 1981 to 1991. VMSI established an office in New York. In 1992 the Pacific International Trust Company and the European Trust Company, based in Port Vila, entered into a contract with the MFEM to administer the international shipping register for a period of 15 years from 1993 to 2008. Vanuatu Maritime Services Limited was thus appointed the Maritime Administrator and purchased the assets of VMSI.[94] A parallel contract with the MFEM was also entered into to market the Vanuatu international shipping register throughout the world for a period of 15 years from 1993 to 2008. Thus Vanuatu Maritime Marketing Limited was appointed the Government's sole marketing agent.

[94] During 1992 and 1993, between the time VMSI retired or withdrew as the Maritime Administrator and the time a new contract with the Government of Vanuatu was concluded, it is understood that Vanuatu Maritime Services Limited administered the international shipping register on an informal basis.

948. In 2007 Vanuatu Maritime Services Limited (VMSL) and Vanuatu Maritime Marketing Limited (VMML) severally with the Government of Vanuatu renewed their appointments as the Maritime Administrator and sole marketing agent to administer and market, respectively, the international shipping register for a further period of 10 years from 1st January 2008 to 31st December 2017.

949. Since the disbandment of the Vanuatu Maritime Authority late 2007 the situation has been in a state of flux. The MFEM has again been allocated the responsibility for the management of the international shipping registry, the general administration of CAP 131, the Maritime Act, and also for overseeing the Maritime Administrator. At the time of the reallocation of responsibilities (28 December 2007) the Government held preliminary discussions with the Vanuatu Financial Services Commission, however, since then the VFSC have had no involvement with the international shipping register; instead a maritime technical advisory committee was established within the MFEM to advise the Minister of Finance accordingly – see also *section 7.8.3*. Just who the Registrar of Ships now is, is not clear or obvious but presumably, by default, the Registrar is the DG Finance. By default and in practice the Vanuatu Registrar of Ships is effectively VMSL and the Registration Office would effectively be VMSL's New York Office.

950. There is no doubt that without the services of VMSL Vanuatu would have been unable to administer an international shipping register or open registry. Furthermore, it seems that VMSL administers the international shipping register effectively and efficiently, and has done so over the past 15 years or so. It is also evident that despite the institutional and governance muddle of the last three years or more VMSL has continued to successfully administer the international shipping register. Notwithstanding this, however, VMSL and its administration of the international shipping register draws much criticism both from official (public) and private sources, with all sorts of allegations. It is considered that the genesis of these criticisms is simply the lack of information about the overall objective of the international shipping register, the Government's objective(s) and role, VMSL's role and functions and the fact that the Registrar of Ships and VMSL have not (never) been audited, although it is understood government officials visited VMSL's New York office once.[95] So like other government agencies, boards, companies, *etc* the Registrar of Ships and VMSL have never been audited and so its operations remain opaque and in turn attract criticism from all directions. This is a situation that can obviously be readily rectified by the appointment of a reputable international auditor to audit the Registrar of Ships, VMSL and VMML and in one way or another put to rest criticism.

7.9 Institutional Requirements

951. The following sections outline the institutional requirements for a national maritime administration for administering the economic (transport) requirements and safety requirements of the various international maritime law instruments Vanuatu has acceded to as well as for developing maritime policy.

7.9.1 Government Responsibilities and Obligations

952. The United Nations Convention on the Law of the Sea (UNCLOS), the International Convention for the safety of Life at Sea 1974 (SOLAS 74), International Convention on Standards of Training, Certification and Watchkeeping for Seafarers 1978 plus the 1995 amendments (STCW 95), require, amongst other things, that a Flag State shall have a competent national maritime administration and that it will set national standards for the safety and security of maritime operations and seek compliance with those standards. This is also an expectation of the International Maritime Organisation (IMO). At the very least a country needs to establish a maritime administration to fulfil its flag state and port state responsibilities to ensure that merchant ships comply with international maritime standards and national maritime standards as applicable.

953. Such a national maritime administration needs policies, authority and a mandate to carry out the government's obligations, responsibilities and duties for:

- the registration of ships;
- establishing safety and security standards;

[95] VMSL maintains offices in Hong Kong, Tokyo, Shanghai, London, Athens, Oslo and Dubai.

- regulating shipping, ports, navigation and other marine operations, including the functional supervision (inspecting, auditing, etc) of these operations – including Flag State control, Port State control and the sea transport markets;
- maintaining the body of Vanuatu law concerning all maritime matters;
- certifying and registering seafarers;
- ensuring the provision of nautical information;
- conducting maritime accident and incident investigations;
- monitoring Vanuatu's sovereignty interests over its territorial waters, continental shelf and exclusive economic zone;
- administering international maritime law instruments to which Vanuatu is a party; and
- representing the interests of Vanuatu at and with international organisations (viz IMO) and with agencies of foreign governments with maritime interests.

954. It is proposed that these obligations, responsibilities and duties be split between a maritime safety regulator and the maritime policy unit within the MIPU on the basis of safety requirements naturally being allocated to a safety regulator and economic or sea transport requirements being allocated to the MIPU maritime policy unit. Such an allocation will maintain a separation of the economic and safety requirements within the maritime system – see section 6.10 - with the addition, in the first instance, that the administration of all international maritime law instruments to which Vanuatu is a party to will always be the responsibility of the MIPU maritime policy unit.[96]

955. There are also maritime facility and service provider functions that the Government (MIPU) has taken upon itself to supply – these are strictly trading activities within the sea transport system for which the DPH was originally set up to provide.

7.9.2 Maritime Safety Administration

956. It is proposed that the Vanuatu maritime safety regulator be called the *Maritime Safety Administration of Vanuatu* or Maritime Safety Administration (MSA). There are two reasons for this. The first is that the term 'Administration' is common throughout the world as a term for a regulator because a regulator deals with 'administrative law'– the term is favoured in North America. The term 'Authority' is also used in reference to a regulator, especially in British spheres of historical political influence; it has both safety and economic connotations and is the favoured term to refer to a port in many parts of the world where there is no connection with safety regulation. The second reason is that the term 'Administration' would help to distinguish the new safety regulator from the discredited Vanuatu Maritime Authority.

957. The Maritime Safety Administration would have the authority and a mandate to carry out the government's obligations, responsibilities and duties for:

- establishing safety and security standards;
- regulating shipping, ports, navigation and other marine operations and providing the functional supervision (inspecting, auditing, etc) of these operations – including Flag State control and Port State control;
- maintaining the body of Vanuatu law concerning all maritime safety matters, in particular the proposed Maritime Safety Act;
- certifying and registering seafarers;

[96] A number of international maritime law instruments to which Vanuatu is a party are safety focused and so in administering these instruments the maritime safety regulator needs to be directly involved. It may also be necessary to involve the State Law Office. The degree of involvement will depend on the initiative or response contemplated by the Government of Vanuatu. Regardless, the MIPU maritime policy unit should (needs to) be the 'post office' for all State communication concerning international maritime law instruments to which Vanuatu is a party.

- ensuring the provision of nautical information relating to standards, rules, technical information for maritime safety and security, navigation, ports, etc, along with delegations of authority, much of which will be entered into the Maritime Register;
- conducting maritime accident and incident investigations for its own requirements as opposed to those of the State, and for providing advice to the MIPU on matters of maritime safety and security; and
- representing the interests of Vanuatu at and with international organisations and agencies of foreign governments with maritime safety interests.

7.9.3 MIPU - Maritime Policy Unit

958. It is proposed that the Maritime Policy Unit within the MIPU be the chief policy adviser to the Minister (Government) on all maritime matters – both economic and safety – and to implement the Government's economic and sea transportation requirements including matters of economic regulation.

959. The purpose or corporate objective of the Maritime Policy Unit should be:

> **To foster a safe, accessible, affordable and reliable sea transport system and to promote the development of the maritime industry for the economic, social and environmental well being of the people of Vanuatu.**

The beneficiaries are the people of Vanuatu. The intended benefit is the improvement of their economic, social and environmental well being. There needs to be a measure of the overall success in achieving the intended benefit – in other words a performance indicator to reflect the success of the Government (MIPU and Maritime Policy Unit) in enhancing the economic, social and environmental well being of the people of Vanuatu.

960. This purpose rests easily with the domestic sea transport system. It also rests easily with the international sea transport system – especially in the context of ports, sea lanes, Vanuatu waters and the international shipping register.[97]

961. Maritime Policy Unit within the MIPU needs to have the authority and a mandate to carry out the government's obligations, responsibilities and duties for:

- advising the Minister (Government) on matters concerning policy, planning, operations and regulation of sea transport and the maritime industry in both international and domestic contexts – this includes infrastructure requirements[98];
- monitoring and managing action taken by the Minister (Government) to intervene in the sea transport markets by granting (economic) licences for the occupation of the foreshore for marine purposes such as the establishment of a port, entering into contracts and arrangements for wharf and stevedoring operations, introducing shipping subsidies, leasing (chartering) of government-owned ships, etc.;
- maintaining Vanuatu maritime law and liaising with the State Law Office; in particular concerning international conventions, national maritime legislation (especially regulations), the Sea Transportation Act, Ship Registration Act and, with the Maritime Safety Administration, updates and revisions of the Maritime Safety Act;
- advising the Minister (Government) on maritime fees and charges and in association with the MFEM managing the Maritime Fund;
- administering international maritime law instruments to which Vanuatu is a party;
- cooperating with international organisations and foreign government agencies in promoting safety and security of life and property at sea and in protecting the marine environment;

[97] For Vanuatu's open ship register the manner in which it is used or abused will also have a direct impact on the international (political) reputation of Vanuatu regarding the protection of its sovereignty; as well having as an economic impact.
[98] This would include, for example, the allocation or granting of cabotage rights to foreign merchant ships.

- administering and ensuring the maintenance of the domestic shipping register;
- liaising with VFSC, VMSL and VMML on matters pertaining to the administration and marketing of the international shipping registry;
- Casualty Investigation Code[99];
- monitoring Vanuatu's sovereignty interests over its territorial waters, continental shelf and exclusive economic zone;
- representing the interests of Vanuatu at and with international organisations (viz IMO) and at and with agencies of foreign governments with maritime interests;
- developing and managing a maritime information database, coordinating research and investigations into maritime developments including the impact of sea transport on economic and social development in Vanuatu;
- establishing and maintaining the Maritime Register[100]; and
- maintaining liaison with ship owners, ship operators, shipping companies and ports within the region, and any other matters the Minister or Director General may direct.

962. As noted in paragraph 915 above where these functions are carried out it by the Government of Vanuatu, they are mostly done so to a lesser rather than greater extent.

963. One of the main functions of the Maritime Policy Unit within the MIPU is to advise the Minister (Government) on all matters pertaining to the maritime industry, the sea transport markets and especially the maritime infrastructure requirements. In doing this the unit needs to develop policy papers that set out the GoV's position, intentions and plans. It would also be expected to initiate, coordinate and prepare port master plans in conjunction with port facility providers, port users and shipping interests. Maritime infrastructure requirements need to be jointly planned and developed with the MIPU's Public Works Department but overall direction would need to be retained by the Maritime Policy Unit otherwise there would be a high risk that maritime infrastructure plans may not reflect the requirements of the overall industry and the sea transport markets.

964. The Maritime Policy Unit would be responsible for administering the Sea Transportation Act and in particular all matters concerning economic regulation, which would involve advising the Minister on the establishment and operation of ports and harbours in the context of the sea transport markets, market intervention in the form of licensing, subsidies or the granting of monopoly privileges and general competition practices. This would include, for example, monitoring and managing contracts and arrangements the government has for wharf and stevedoring operations, shipping subsidies, leasing (chartering) of government-owned ships and any contractual arrangement the government enters into for the provision of maritime services and facilities, *etc*. Presently the monitoring and management of government contracts and arrangements for wharf and stevedoring operations at Port Vila and Luganville is the responsibility of the Department of Ports and Harbours (*ie* Harbourmaster) but is not being done. Similarly the agreement for the leasing of the two government ships to private companies has not been monitored and managed; as a consequence the monthly lease payments were rarely paid, the ships were never insured nor adequately maintained to the extent that one ship deteriorated to a state of disrepair and the other poorly maintained. While the contract was signed by the Minister (MIPU), contract monitoring and management was forgotten,

[99] Such investigations are a State obligation to facilitate objective marine safety investigations for the benefit of flag States, coastal States, the IMO and the shipping industry in general. It is designed to also incorporate and build on best practices in marine casualty and marine accident investigation. In this regard from January 2010 States will be expected to comply with the IMO Casualty Investigation Code. This State obligation and responsibility is quite separate from maritime accident and incident investigations conducted by the Maritime Safety Administration, which are conducted for their own purposes. Investigations would be conducted by the Accident Investigation Board (AIB) proposed in the Sea Transportation Act, unless the (lesser) gravity of the accident or incident merited investigation by the Maritime Safety Administration alone or the Maritime Policy Unit itself.

[100] The establishment of a Maritime Register is proposed in the Sea Transportation Act. The Maritime Register is a very important set of documents that maintains and preserves records and documents relating to the Vanuatu maritime system. The performance and activities of the maritime and sea transportation systems are essentially measured by this information. In particular the Maritime Register includes the Vanuatu Register of Ships – Part A and Part B – although this Register is a separate document or register it is none the less part of the Vanuatu Maritime Register – it would also include, for example, an asset register of all maritime infrastructure.

probably because of insufficient resources but perhaps also the lack of inclination. In the meantime the two shipping companies operating the ships receive an unfair advantage in the domestic shipping market over other ship operators simply because they do not pay the cost of capital for the ships (very little in the way of charter or lease fees were paid). The main beneficiaries of this episode are the owners of the shipping companies operating the government ships as it is understood that not all the shipping services intended to be operated were provided.

965. On the matter of the representation of Vanuatu's interests with international organisations, Vanuatu appears to have a 'Permanent Representative to the IMO'. It seems the appointment was made under the authority of the Vanuatu Maritime Authority.[101] The project team has been unable to locate the instrument of appointment, the nature of any delegations of authority and the terms of reference. For the permanent representative also no reports or copies of correspondence relating to this representation or IMO business have been located. The point is it is not apparent why Vanuatu requires a permanent representative to the IMO and in any event why such representation could not be provided by, for example, by Vanuatu's Ambassador to the European Union with appropriate support from the MIPU or other Vanuatu government department – this was done for Vanuatu's participation in a recent UN climate change forum. Ordinarily such representation would involve the responsible Minister supported by senior officers from the national maritime administration. Regardless, the reasons for such an appointment, the scope and terms of reference along with the question of delegations of authority need to be reviewed. Vanuatu has been a member of the IMO since 1986.

966. Ship registration is usually seen as a safety requirement but it is primarily economic requirement. It is a record of the merchant fleet and other ships that operate under a particular national (Vanuatu) flag. It is a necessary record for safety requirements. As already noted, in Vanuatu's case, the international shipping register was established as a revenue generating instrument. It can therefore be argued that its origins are economic rather than in response to a maritime safety requirement. However, having established an international shipping register there are consequential maritime safety obligations (*viz* Flag State Control).

967. A Ship Registration Act has been proposed that creates two ship registers: an international register (Part A) and a domestic register (Part B). The questions therefore arise as to who should be the Registrar of Ships, where should the Registry (Registration Office) be kept and how will it be administered?

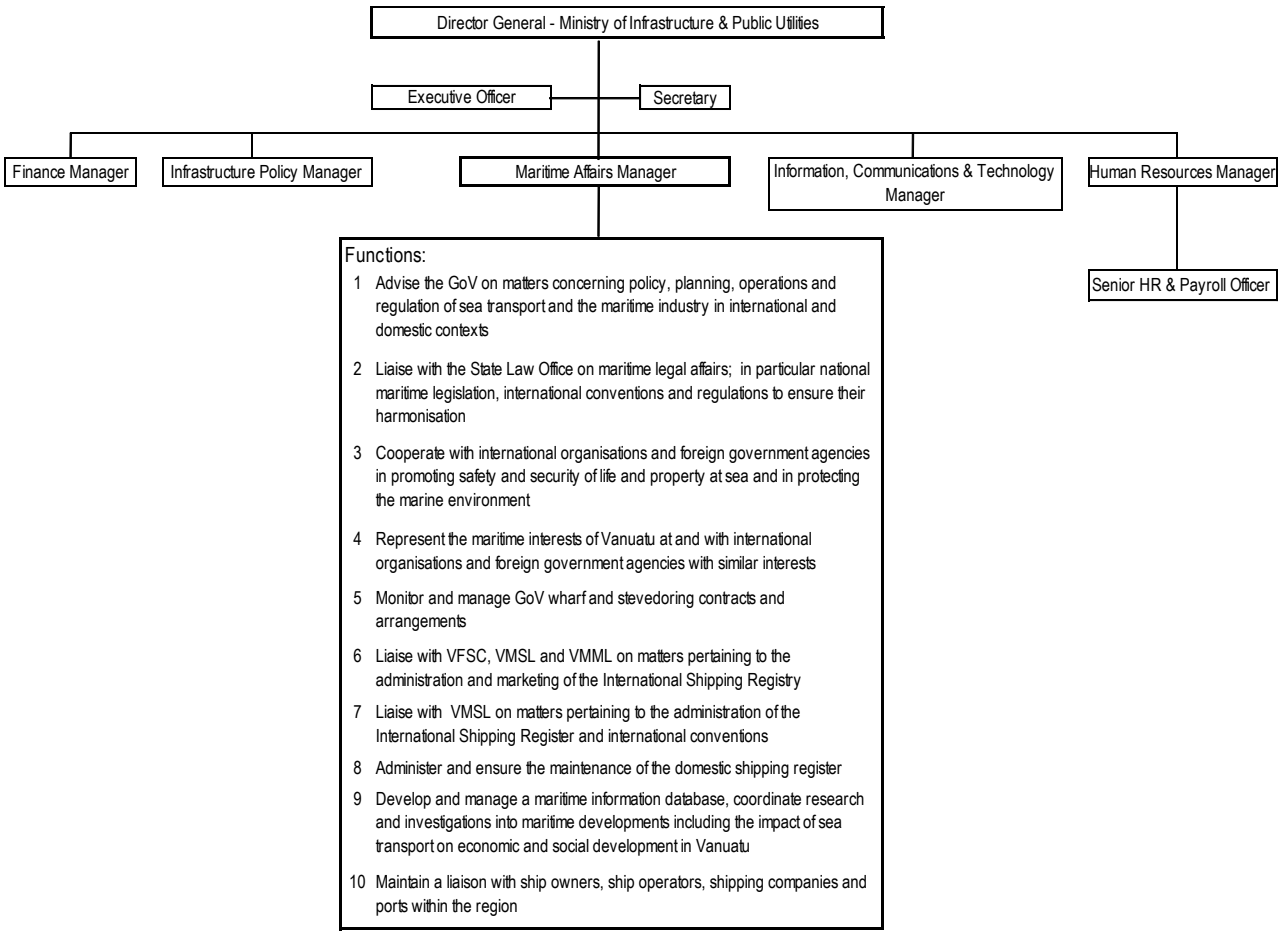
968. For the domestic fleet (Part B) the answers are straightforward. The Register of Domestic Ships should be kept and maintained by the Maritime Policy Unit of the MIPU, with the Registrar of Domestic ships being the manager of the Maritime Policy Unit (*i.e.* maritime affairs manager). Alternatively the Register of Domestic Ships could be kept and maintained by the Maritime Safety Administration, with the Registrar of Domestic Ships being the Director of Maritime Safety (*i.e.* chief executive of the Maritime Safety Administration). For the domestic fleet it is recommended that the Registrar of Domestic Ships be the manager of the Maritime Policy Unit and the Register kept and maintained by the Maritime Policy Unit of the MIPU. Even so, the Maritime Policy Unit could hand over the administration of the Domestic Ship Register to the Maritime Safety Administration, but, the Registrar would still be the manager of the Maritime Policy Unit.

969. For the international fleet (Part A) the answers are not so straightforward and its history is discussed in section 7.8.6 above. Whatever arrangements are made it will be very important to ensure that the administration of the International Ship Register (Part A) is as seamless as possible. The International Ship Register (Part A) could be responsibility of the Maritime Policy Unit or the Maritime Safety Administration or the Vanuatu Financial Services Commission (VFSC). In turn the Registrar could be the manager of the Maritime Policy Unit, Director of Maritime Safety or VFSC Commissioner. Recognising that ship registration is mainly an economic requirement it is recommended that the Registrar of International Ships be the manager of the Maritime Policy Unit and the Register kept and maintained by the Maritime Policy Unit of the MIPU. The administration of the International Ship Register would continue to be handled under contract with VMSL and VMML, but, the Registrar would be the manager of the Maritime Policy Unit.

[101] The IMO contact addresses of the offices of designated national authorities for facilitation purposes for Vanuatu currently lists the contact details for Vanuatu as being the Commissioner of Maritime Affairs, Marine Quay, Port Vila (tel: 678-231-28) – dated 9 March 2009 – no update has been advised to the IMO – there is no mention of Vanuatu's Permanent Representative.

970. *Figure 7.5* illustrates the institutional arrangement within the Office of the Director General for administering the economic (transport) requirements within Vanuatu's maritime system and summarises the main functions of the Maritime Policy Unit. It is evident that the role and functions of the Maritime Policy Unit within the MIPU require more than a 'one-man band'. Once the authorities and mandates are in place then at the least two persons will be required to satisfactorily cope with the role, functions and tasks of the Unit. If the Maritime Policy Unit is to include the Registry for domestic shipping (i.e. Registration Office) rather than being handed over to the Maritime Safety Administration then additional resources will be needed.

Figure 7.5: **Office of the Director General MIPU**



7.9.4 Public Works Department – Environmental Unit

971. For infrastructure project implementation the executing (implementing) agency usually sets up a Project Implementation Unit (PIU) where an Environment and Social Unit (ESU) is normally a component the PIU. This enables the executing (implementing) agency to directly comply with environmental requirements. Without an ESU the MIPU would then need to rely on an external agency and compliance with environmental safeguards would probably be more problematic. The role of the ESU is to ensure standards are complied with and environmental safeguards are provided for. An ESU usually consists of:

- an environmental specialist to look after the implementation of the environmental safeguard requirements;
- a communications specialist to handle public consultation requirements; and
- a land acquisition specialist to look after land acquisition and resettlement issues.

972. A small Environmental Unit (EU) is located within the Ministry of Lands. The EU's role is the development and administration of environmental policies and standards at both national and international levels as well as the approval of environmental assessments. It would be inappropriate

for the standard setter and 'regulator' to be involved in any project implementation process, as this would be a direct conflict of interest. This was recognised in the Millennium Challenge Account (MCA) project and so the position of an Environmental and Social Impact Officer (ESI) has been established within the Public Works Department (PWD) and an appointment is pending.[102] As part of the MCA project the PWD has arranged for the appointment of an international environmental specialist (on a volunteer basis) for two years to assist in staff training[103].

973. In recognition of the need for an ESU the Public PWD supports the permanent establishment of such a unit within the PWD. It is understood that the PWD has approval for additional staff to fill specific positions (*viz* airport engineer, maritime engineer, water engineer, civil works engineer, *etc*). In order to complete the establishment of an ESU it is suggested that approval and provision also be made for the appointment of a communications specialist and land acquisition specialist. The ESU would have a dual role:

- to support project construction during particular project implementation as part of the PIU; and
- to provide environmental support for other departments within the MIPU including the PWD itself.

974. It is suggested that the ESU be located within the PWD reporting to the Principal Engineer. An alternative would be to place the PIU outside the PWD within the Office of the Director General or as a separate stand alone unit. On balance it is preferable to located the PIU within the PWD as it is anticipated that much of its activity would be in support of infrastructure construction and maintenance and that as a stand alone unit or within the Office of the Director General it would be once-removed from the 'coal face'.

975. Implementation of the Port Vila wharf construction and outer island jetties would probably include the appointment of an internationally recruited environmental management consultant for a period of six months. It is assumed that the PWD would have a significant role in implementation.

7.10 Organisational Strategies

976. One of the first decisions to make is to decide the organisational focus of the maritime safety administration and the Department of Ports and Harbours (DPH). Safety regulators are (usually) organized in one of four ways: with the focus on the client (the regulated)[104], with the focus on the type of service provided, or with the focus on the production or internal functional processes of the organisation, or with the focus on competencies.

977. Trading organisations or providers of services like the DPH (and for that matter any company) are organised in one of three ways: with the focus on the customer, with the focus on the type of service provided by the organisation, or with the focus on the production or internal functional processes of the organisation. There can be some mix or "nesting" but generally trading organisations take on the main characteristics of one of these organisational strategies.

978. These generic models are described in *Appendix 7.1*. Organisational strategies for the Maritime Safety Administration and the Department of Ports and Harbours are discussed below.

7.10.1 Recommendation – Maritime Safety Administration

979. The proposed organisational structure is one that best deals with the key strategic issues confronting maritime safety regulation and the provision of specific ports and marine services in Vanuatu and that best supports the strategies needed to enable the organisation to achieve its objectives.

980. The key issues confronting maritime safety in Vanuatu are identified in section 6.14 above. They are:

[102] The appointment is planned for October 2009.
[103] The volunteer is expected to commence work with the DPW in October 2009. It is expected that the appointment of the international volunteer to the MIPU would facilitate the establishing of the ESU in addition to undertaking training.
[104] The term 'client' is used to indicate the actual maritime industry 'client' receiving regulatory 'services' rather than the indirect beneficiaries of the system, that is society at large or the people of Vanuatu.

- *ship operations* - ship operational management, crewing levels, safety and navigation equipment, cargo and passenger weight disposition, ship seaworthiness and maintenance;
- *wharf infrastructural safety;* and
- *seafarer competency* - training, certificates of competency and registration.

The government's passive role in the administration of those international maritime law instruments concerning safety and marine pollution, that it is a party, to is also considered to be a key issue.

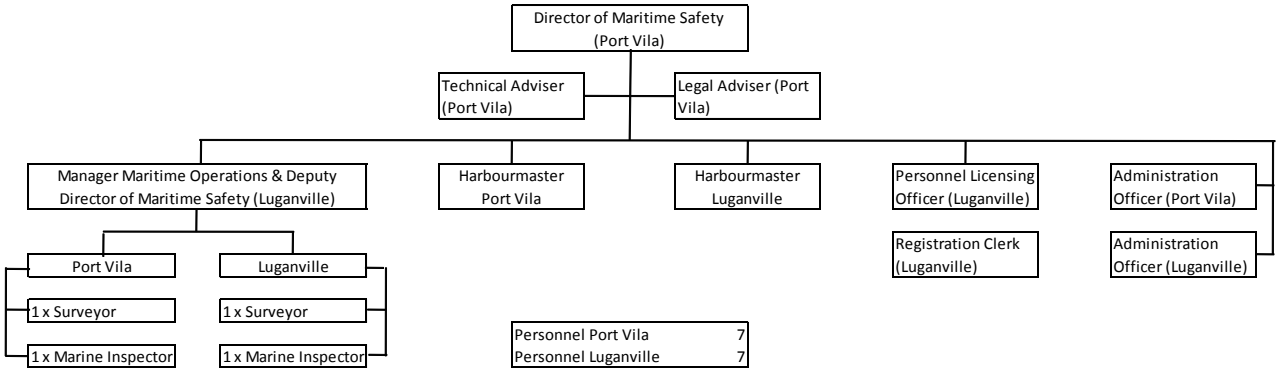
981. Thus the Maritime Safety Administration (MSA) should be a department within the MIPU and headed by a director. In order to focus on these key issues it is recommended that the 'competency' model (outlined in *Appendix 7.1, section 4*) form the basis of the new organisation with each unit organised along 'client' lines to reflect the clients' geographic location (see *Appendix 7.1, section 1*). A major assumption is that the Maritime Safety Administration adopts the 'life-cycle' regulatory approach. *Figure 7.6* illustrates the organisational arrangement

982. This structure incorporates the advantages of the 'client' model that is embedded within each unit along with those of the 'competency' model that is the basis of the MSA's structure. The disadvantages of the 'competency' model are largely overcome by organising each unit within the organisation along 'client' lines. The inclusion of a technical advisor will enable safety standards and rules to be developed and maintained, especially in the early years, and equally important enable quality standards to be more readily maintained across the organisation. A legal adviser will be important to the development of safety rules and regulations as well as in the areas of compliance and enforcement.

983. The proposed organisation has been designed to carry out the specific role of a maritime safety regulator and to address the key strategic issues noted above. In particular it has been designed to meet the need:

- for safety regulation and oversight reflecting different levels of safety for both Flag State control and Port State control - and in particular the current (poor) safety performance of the domestic industry;
- for a relatively high quality of service;
- for an international focus and international recognition;
- for industry-focused communications;
- for financial management; and
- to carry out the necessary 'business' and 'corporate' activities required for the management and control of the organisation.

Figure 7.6: **Maritime Safety Administration**



984. In this regard two harbourmaster positions have been established within the MSA to provide safety oversight of international and domestic port and wharf operations at Port Vila and Luganville in particular and the outer islands in general. This is a departure from traditional institutional

arrangements where the harbour master has been located in the Department of Ports and Harbours and has been responsible for a variety of marine operations in addition to the primary role of safety regulation.

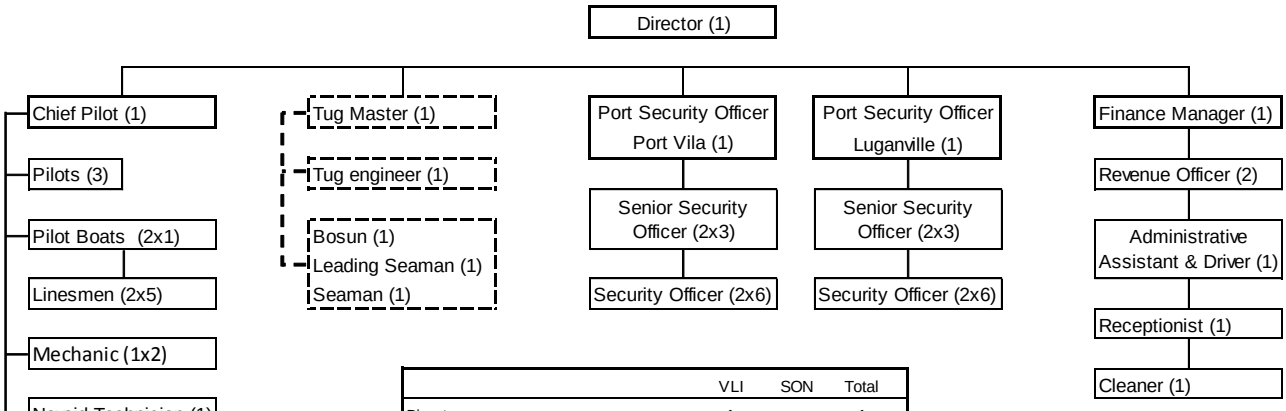
985. In all, the proposed organisation will initially require 14 people, which compares to the seven that is the current establishment for the 'Licensing Unit' within the Department of Ports and Harbours and 12 people that comprised the Vanuatu Maritime Authority prior to its disbandment (and excluding the Board members). The Director of Maritime Safety would be located in Port Vila and the Deputy Director and Manager of Maritime Operations located in Luganville, which are the two maritime industry and administrative centres in Vanuatu. It is possible that additional marine inspectors and surveyors will be required as the MSA takes up its role and functions.[105] The proposed role and functions of the MSA are outlined in section 7.12 below.

7.10.2 Recommendation – Department of Ports and Marine

986. The proposed structure for the Department of Ports and Harbours has a 'functional' focus where the organisation is arranged around 'service provider' outputs (see *Appendix 7.1*, *section 3*) that the department produces: pilotage, nautical information and navigations aids, port security and towage once the tugs arrive. All safety regulatory functions have been moved into the Maritime Safety Administration. *Figure 7.7* illustrates the proposed structure – the hatched lines indicate future requirements.

987. A simple structure is proposed that will enable the department to more easily manage costs and the services it provides. A name change to the Department of Ports and Marine (DPM) is also proposed to more accurately describe the activities of the department.[106] While the emphasis remains the international ports of Port Vila and Santos (Luganville) the department will continue its responsibilities for the maintenance of navigation aids throughout Vanuatu and will be responsible for the updating and provision of nautical information for Vanuatu.

Figure 7.7: **Department of Ports and Marine**



	VLI	SON	Total
Director	1		1
Pilotage services	12	10	22
Tow age services	5		5
Security services	10	10	20
Finance & administration	5	1	6
Total all functions	33	21	54

VLI = Port Vila
SON = Luganville

988. The significant functional differences to those of the current Department of Ports and Harbours are shifting the harbourmasters' responsibilities for maritime safety out of the DPM and into the Maritime Safety Administration along with the Principal Licensing Officer's unit. In addition, the monitoring and managing of government contracts for the provision of wharf operations and

[105] A marine inspector is a safety regulator with deck officer (Master) qualifications and experience. A surveyor is a marine engineer (chief engineer) with appropriate qualifications and experience.
[106] The Public Service Commission's records refer to a Department of Ports and Marine rather than the Department of Ports and Harbours.

stevedoring services, etc has been allocated to the Maritime Policy Unit within the MIPU. Apart from being a potential conflict of interest in the provision of port services because of its 'economic' regulatory or oversight function, this task was (is) not carried out by the current DPH (see section 7.8.5 above) as the department was (is) ill equipped to do so and there was (is) a lack of inclination to do it. Government contracts involving ports, shipping and marine services are mostly negotiated by the MIPU and signed by its Minister and so it makes sense for the MIPU to manage the contracts on behalf of the Government, that is to say carry out the 'economic' regulatory or oversight.

989. According to the Public Service Commission's establishment records the current DPH has an establishment of 49 excluding the Principal Licensing Officer's unit - 33 positions are filled.[107] It is proposed that the establishment for the Department of Ports and Marine be 54. So there are theoretically five more positions than in the current department; excluding provision for a tug this is 16 more positions than currently filled within the Department of Ports and Harbours.[108] There is no change to the finance and administration unit. The port security unit gets a dedicated port security officer for each port – an arrangement more in line with the ISPS code requirements - rather than the harbourmaster assuming the role on a supernumerary basis. The provision for a tug is in line with the current DPH establishment. It is in the pilotage services where additional staff is proposed; five more people are proposed if the harbourmasters are included.[109] .

990. Depending on the Government's maritime ambitions and how the government embraces its responsibilities for navigation aids and the provision of nautical information there could be need for additional people in the future. The proposed role and functions of the MSA are outlined in section 7.11 below.

7.11 Proposed Department of Ports & Marine

991. Section 7.10.2 above details the proposed organisational structure for the proposed Department of Ports and Marine (DPM). Figure 7.13 illustrates the organisational arrangement that is based on a 'functional' focus or the services that the DPH provide. The role and functions of the DPM are summarised below.

7.11.1 Objectives

992. One of the most important corporate decisions is to decide on the corporate objective for the DPM. The corporate object will depend on whether the DPM is considered by the Government to be a 'profit organisation' or a 'not-for-profit organisation'.

993. If it is to be a profit organisation then the corporate objective will be very simple and it can only be to make a profit. Every company that was ever formed did so to make a profit - every company that failed, failed because it did not make a profit. So profit is the raison d'être of every company. An organisation need not be a company to have as its corporate objective 'to make a profit'. Anyway, all that needs to be done is to decide on how much profit and express it in some form such as return on capital, a percentage of total revenue (*ie* an average profit margin, excluding an allowance for capital costs, over the four years 2005-08 was 59%) or a simple amount such as 120 million Vt. In this case the intended beneficiary of the DPM's operations is the Government.

994. If the DPM is to be considered a not-for-profit organisation then deciding on its corporate objective(s) is more difficult. To do this the intended beneficiaries of the organisation must first be determined along with the intended benefit and then deciding on the levels of intended benefit that would represent success and also failure. This is not usually an easy process and takes some time and attention to determine. Nevertheless, setting corporate objectives for a not-for-profit organisation is the most important decision the organisation makes. If it is inappropriate or wrong the organisation will fail but if it is appropriate or correct then it will flourish.

[107] The Director of Ports and Harbours was suspended by the Public Service Commission early Q3/09 and so 32 positions are filled.
[108] 54 in total less 5 tug crew less 33 in the DPH.
[109] The five comprise: two linesmen, one mechanic to be shared with the tug on its arrival), one clerical officer for Santo and a nautical information officer for Port Vila. The harbourmasters also carried out pilotage duties and so two additional pilots will be required to replace the harbourmasters. From time-to-time the harbour masters could be contracted to do specific piloting work in the event of pilot shortages or for a special task. While this could involve a potential conflict of interest it would need to be clear in the terms of the contract that the harbour master is performing pilotage work for the DPM and that a harbour master 'hat' would not be worn at the same time.

995. It is suggested that the DPM be considered a profit organisation.

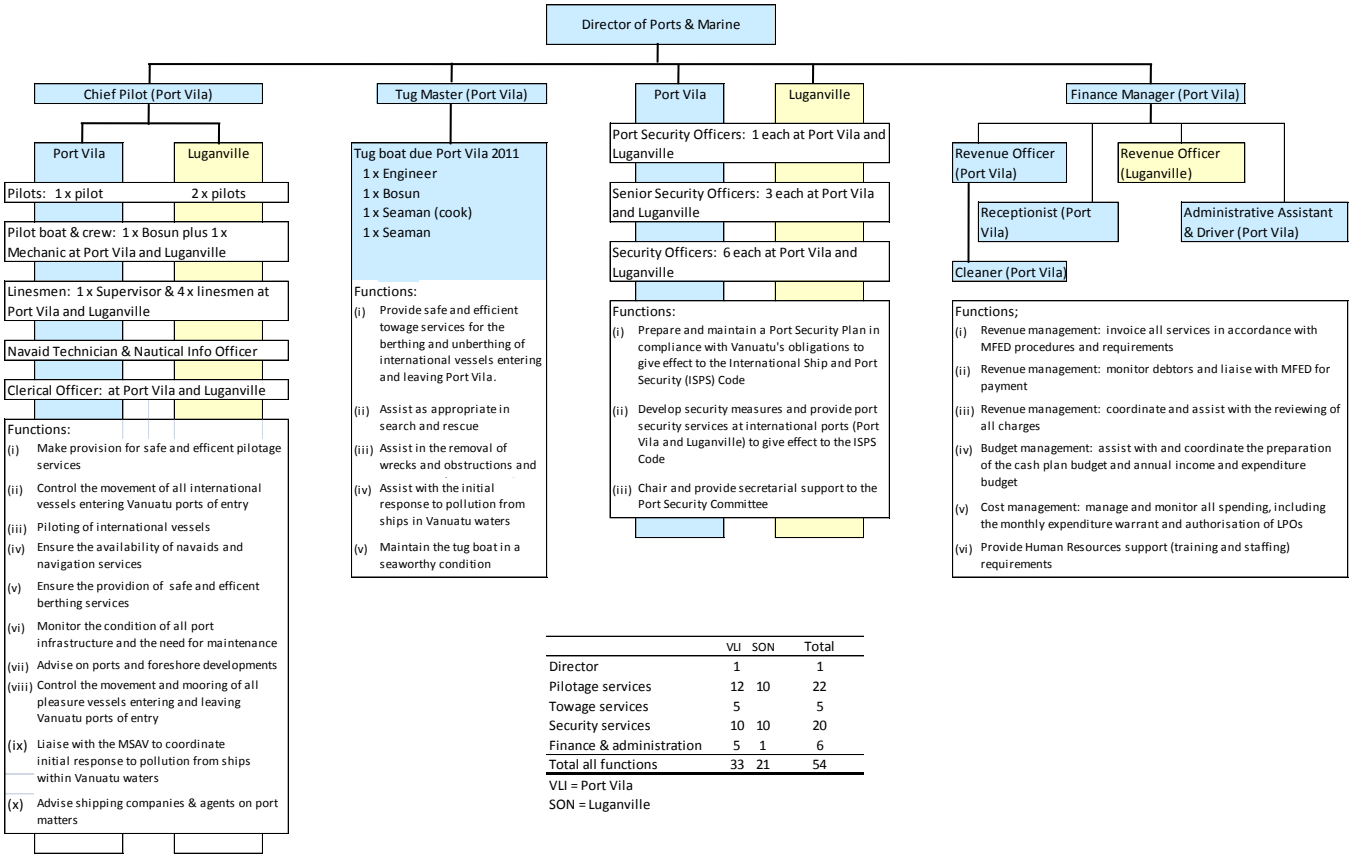
7.11.2 Pilotage and Berthing Services

996. The provision of pilotage services is probably the most visible service the DPH provides. These services are provided in both Port Vila and Luganville to international ships. Four pilots are required, two each in Port Vila and Luganville, plus a pilot boat for each port.

997. The DPM provide berths and also charge berthage and wharfage to help recover the capital costs and maintenance of the wharf. A team of four linesmen plus a supervisor is considered necessary to safely berth the largest ships (usually cruise ships) in each port.

998. The functions of the pilotage unit of the DPM are summarised on *Figure 7.8*.

Figure 7.8: **Proposed Department of Ports and Marine**



	VLI	SON	Total
Director	1		1
Pilotage services	12	10	22
Towage services	5		5
Security services	10	10	20
Finance & administration	5	1	6
Total all functions	33	21	54

VLI = Port Vila
SON = Luganville

7.11.3 Navigation Aids and Nautical Information

999. The availability and maintenance of navigation aids and nautical information are two of the functions of the DPM. It is logical that these two functions be located alongside the pilots who rely on these facilities and information. Therefore the navaid technician and nautical information officer are located in the section or unit that is managed and controlled by the chief pilot. They would be based on Port Vila but would need to travel within Vanuatu in order to carry out their tasks.

1000. Presently the DPH does not have a dedicated nautical information officer to access, collate, review and distribute nautical information concerning Vanuatu's sea transport system, especially the status of navaids, updating nautical charts, distributing notices to mariners, *etc*. The nautical information officer would take over these tasks and also ensure that nautical charts are available on demand. This person could provide backup for the VHF coastal watch system that would be best manned by the Police Maritime Wing. The nautical information officer will need to liaise with the Maritime Safety Administration to ensure that Vanuatu complies with international standards with respect to navaids, charts and nautical information as well as complying with domestic requirements.

1001. Like other Pacific Island States the nautical charts for Vanuatu are mostly out of date and unreliable, especially navigation information.[110] This is especially true for the locations cruise ships are interested in visiting. It was made known by the cruise ship industry at the ADB conference, *Oceanic Voyages: shipping in the Pacific*, held in Cairns, Australia, in 2008 that the lack of reliable nautical information is a hindrance to the further development of cruise shipping in the region – including Vanuatu. There is an urgent need for a hydrographical survey of most countries in the South-west Pacific.[111]

7.11.4 Towage

1002. With the arrival of a tug in 2010-11 the DPM will have a towage capability and capacity based at Port Vila. The proposed functions of the tug and its crew are summarised in *Figure 7.8*.

7.11.5 Port Security

1003. It is proposed there be a port security officer at each of the international ports of Port Vila and Luganville who report to the director of DPM and who will maintain continuous communication between the two ports. The task of port security officer is presently a supernumerary task of the harbourmaster and as such Vanuatu does not receive the management and control envisaged under the ISPS code – they are therefore new appointments. In each port the port security officer would be supported by three senior security officers, shift supervisors, and six security officers to provide 24 hour seven days per week coverage. The functions of the two port security units are also summarised in *Figure 7.8*.

7.11.6 Financial Management

1004. The DPM is one of the Government's main revenue earners. As a 'profit organisation' it is very important that the DPM has a top class revenue and cost management capability and capacity along with a competent budget management capability. It is recognised that a limiting factor in this is the requirement for the DPM to work within the Ministry of Finance and Economic Management's billing and revenue collection (Portcam – Smartstream) system. While it is understood that it is MFEM's responsibility to follow up late payments and delinquent accounts the DPM should also actively participate in the oversight of revenue collection (management). An important task for the DPM's finance unit is to review its fees and charges to optimise revenue according to the characteristics of the ships that use its services and other charges that apply within the region.

7.11.7 Recommendations

1005. Because of the functional focus of the DPM's organisational structure and especially the division of tasks between Port Vila and Luganville it will be important for the DPM's senior management to develop, implement and maintain effective internal communications within and between each of the units. To facilitate this it is suggested that there be a senior management meeting each month that alternates between Port Vila and Luganville. In addition each week senior managers within each port formally meet and the minutes of the meeting be distributed to the other port.

1006. An early task for the director should be to develop a training programme to ensure all staff remain current with developments within the maritime system. To facilitate this and to provide the sea transport system with the best possible service it is suggested that staff be seconded between Port Vila and Luganville from time-to-time in order to broaden in-house capability, provide an effective backup for all services and introduce some variety for DPM staff.

1007. It is also suggested that the Deputy Director be appointed on a contingency basis from amongst the senior management in both Port Vila and Luganville and that a director's representative be appointed form amongst the senior managers at Luganville to represent the director locally.

[110] Except for those areas surveyed by the US Navy in 1943 the survey data dates from the 1880s.
[111] A hydrographical survey of the South-west Pacific would make a worthwhile long term technical assistance project, perhaps under the Pacific Island Infrastructure Fund in which the Australia and New Zealand navies could participate, with perhaps Australia covering Melanesia and New Zealand Polynesia.

7.12 Maritime Safety Administration of Vanuatu

1008. The proposed organisational structure and its rationale are discussed in *section 7.10.1* and *figure 7.5* illustrates this structure. The Maritime Safety Administration (MSA) is a relatively small organisation for its responsibilities, obligations, role and functions. It would be responsible for administering the proposed Maritime Safety Act, implementing international maritime law instruments relating to safety and ensuring compliance with marine environmental requirements, Flag State control, Port State control, port and harbour safety functions that were previously the responsibility of the Department of Ports and Harbours (*viz* harbourmaster) and matters relating to the training, competency and registration of seafarers including STCW 98.

1009. *Figure 7.6* depicts the main role and functions within the Maritime Safety Administration and should be compared to the organisational structure in *Figure 7.2*. The MSA's staff are equally distributed between Port Vila and Luganville. The Director of Maritime Safety is located in Port Vila and the Deputy Director and Manager of Maritime Operations is based in Luganville.

1010. A feature of the proposed structure is the inclusion of a technical adviser and a legal affairs adviser. These two positions will be very important in the development of safety standards, rules and regulations, which will be a major undertaking for the MSA that will extend over a number of years.

1011. The following sections elaborate on the role and functions of each unit within the MSA.

7.12.1 Objectives

1012. The MSA is plainly a not-for-profit organisation and it owes its existence to Vanuatu's responsibilities and obligations as a party to primarily UNCLOS, SOLAS, STCW and MARPOL.

1013. One of the most important corporate decisions is to decide on the corporate objective for the MSA. The MSA is a 'not-for-profit organisation' and so deciding its corporate objective is not necessarily straightforward. Nevertheless, setting corporate objectives for a not-for-profit organisation is arguably the most important decision the organisation makes. As previously noted, if inappropriate or wrong the organisation will fail but if appropriate and correct then the MSA will flourish. First, the intended beneficiaries of the MSA must be identified along with the intended benefit and then a decision needs to be made on the levels of intended benefit that would represent success and also failure.

1014. The intended beneficiaries are the people of Vanuatu. This is true for Vanuatu's involvement in both the domestic and international maritime systems. The domestic dimension is obvious but the international connection may not be immediately apparent. As noted earlier, Vanuatu's ports and harbours service international merchant ships and cruise ships, its territorial waters and sea lanes are used by international commerce and Vanuatu maintains an open ship register. Of course there are various 3rd party non Vanuatu beneficiaries connected with international shipping sailing under the Vanuatu flag (*eg* crew, users of ships, *etc*). If any of these exhibited unacceptable or poor safety performance or had a reputation for low safety standards the Government and people of Vanuatu would suffer both in a welfare (safety and health) and economic context. The benefit that the people of Vanuatu require is a safe maritime system and one that complied with international or appropriately developed national safety standards would be satisfactory and the minimum acceptable level of 'benefit'. Thus it is proposed that the purpose or corporate objective of the MSA be:

To promote safety within the maritime system for the benefit the people of Vanuatu.

7.12.2 Director

1015. One of the main tasks of the Director is to ensure that Vanuatu's responsibilities as a Flag State and Port Sate are fulfilled in an effective and efficient manner. This may, amongst other things, involve the delegation of authority to individuals or organisations to carry out specific functions required for Flag State control and Port Sate control.

1016. The Director will work with and advise the MIPU (Maritime Policy Unit) on matters of safety policy and assist in the administration of international law instruments. The Director would represent, as required, the maritime safety and security interests of Vanuatu at and with international and regional organisations and agencies of foreign governments with similar interests.

1017. The Director also administers the Maritime Safety Act – the MSA is in effect a statutory administration but responsible to the Minister although and within the MIPU. In this regard the

Director is responsible for ensuring that national maritime legislation is applicable to, right and proper for the Vanuatu maritime system.

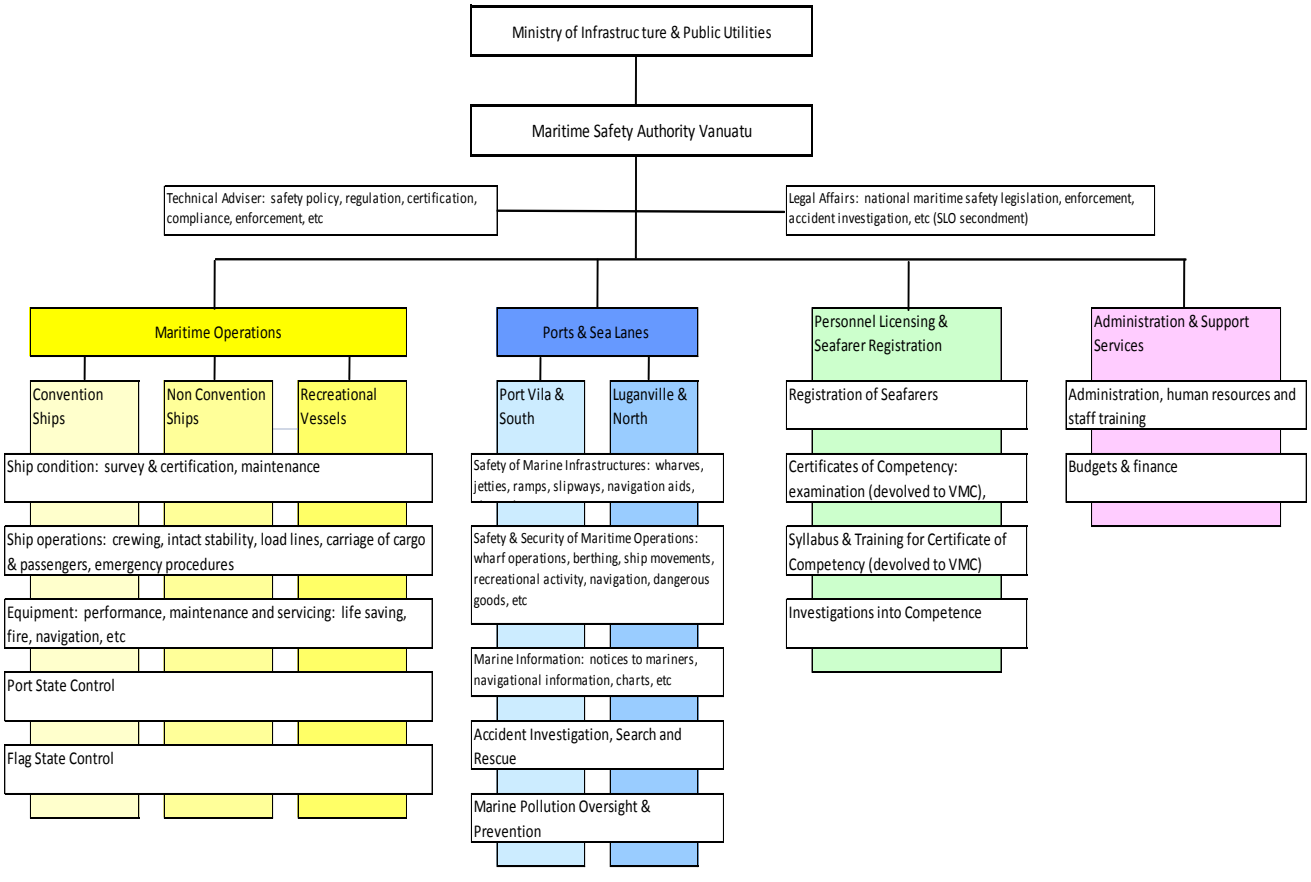
1018. The Director is also the chief executive officer of the MSA and it is important that this be filled by a Vanuatu citizen.

7.12.3 Technical Adviser

1019. The MSA and the Director will require specialist technical advice from the outset. The Technical Adviser will provide this covering such matters as safety and security policy, maritime regulation, safety standards, marine environmental protection, certification (seaworthiness and competency), compliance, enforcement and general maritime industry matters. A Technical Adviser will be required from the outset for perhaps up to five years as one of the adviser's main tasks will be to assist in the development and implementation of safety standards and rules.

1020. The Technical Adviser will require considerable knowledge, skill and experience as a maritime safety regulator. An expatriate from a developed maritime nation in the region would be appropriate. It is unlikely that a person with all the skills noted above would be available or could be found but a person with considerable maritime safety regulatory experience would be able to cover most of these skills.

Figure 7.8: **Functional Arrangement of MSA**



7.12.4 Legal Affairs

1021. A Legal Affairs Officer will be required to provide professional advice on the development and management of Vanuatu maritime legislation and its harmonisation with international maritime law. The Legal Adviser will have a key role in the development and implementation of safety rules and regulations. This person will also provide advice on enforcement and accident investigation.

1022. The State Law Office (SLO) has indicated that a Legal Affairs Officer would be available on secondment at least one day per week. The development of safety rules and regulations will be an

ongoing process and the work load in the initial years can be expected to be heavy. It will therefore be necessary to come to some arrangement with the SLO as to how best to cover this workload.

7.12.5 Ship Operations

1023. The Ship Operations Unit will consist of (initially) four 'inspectors': two in Port Vila and two in Luganville, with a surveyor and marine inspector in each location. More 'inspectors' may (will) be required depending the 'activeness' of safety oversight. The responsibilities of the Ship Operations Unit will encompass: convention ships (generally seagoing engaged in foreign trade), non convention ships (generally domestic trade), fishing vessels and recreational vessels. This is also the unit that undertakes Flag State control and Port State control. For convention ships Vanuatu's Flag State responsibilities would need to be fulfilled by delegations of authority from the Director (as noted above) as the MSA lacks the capability and capacity to do this. A similar approach is likely to be necessary for small vessels operating in the outer islands for hire or reward. Port State responsibilities can be satisfactorily fulfilled by the MSA supplemented as required by a 3rd party with a delegation of authority. For non convention vessels, fishing vessels and recreational vessels the MSA should have the capability and capacity to exercise Flag State responsibilities.

1024. The following safety oversight functions would be undertaken by the Sip Operations Unit:

- ship operation and management: crewing (manning and competency), carriage of passengers, cargo and intact stability, load lines, emergency procedures, etc;
- onboard equipment: equipment performance, maintenance and servicing, life saving and fire appliances, navigation equipment, etc;
- ship surveys and certification;
- Port State control;
- Flag State control; and
- assist in the development of safety standards and rules.

1025. These safety oversight functions and standards development will recognise the different levels of safety standards that are applicable between the ship categories: convention ships, non convention ships and recreational ships.

7.12.6 Ports & Harbours

1026. Two harbourmaster positions have been established within the MSA to provide safety oversight of international and domestic port and wharf operations at Port Vila and Luganville, in particular, and the outer islands in general. As noted this is a departure from traditional institutional arrangements where the harbourmaster has been located in the Department of Ports and Harbours and has been responsible for a variety of marine operations in addition to the primary role of safety regulation. The harbour master currently acts as chief pilot, provider of safe and efficient port services to "all overseas vessels", controller of all international vessel movements in any 'declared' port, monitor of Government wharf operations and stevedoring contracts, safety manager of all 'declared' ports in Vanuatu, administrator responsible for the Ports Act and its regulations, monitor and manage port infrastructure and port related developments. Inevitably some of these responsibilities and functions get overlooked or 'fall between the 0'.

1027. The object of the Ports and Sea Lanes Unit is to provide safety oversight for all operations within the ports subsystem and the waters and seas subsystem that are components within the maritime and sea transport systems (refer sections 6.1 and 6.2). From a safety oversight perspective these two subsystems can be overlooked. The role and functions of the Ports and Sea lanes Unit are to regulate and provide safety oversight for:

- marine infrastructures: wharves, jetties, ramps, slipways, navigation aids, channels etc
- marine operations within ports and harbours: wharf operations, berthing, ship movements, recreational activity including mooring and anchorages, navigation, dangerous goods, wrecks and obstructions, etc

- marine information: navigational information, charts, accuracy, notices to mariners, quality and availability
- accident investigation and search and rescue, and
- marine pollution and prevention.

1028. Any accident investigation conducted by the Maritime Safety Administration would be for its own purposes as opposed to the Government's obligations under the IMO Casualty Investigation Code, which is provided for in the proposed Sea Transportation Act. Nevertheless the MSA (harbourmaster) may be called upon by the Minister to advise on the need for such an investigation under the Act provided a conflict of interest with the MSA did not exist.

1029. Search and rescue is the responsibility of the Police Maritime Wing, however, when specialist advice concerning maritime operations and Vanuatu waters and sea lanes is required the MSA (Harbourmaster) would provide such advice – note this is not a maritime safety matter but the provision of particular services.

1030. Vanuatu is a signatory to the International Convention for the Prevention of Pollution from Ships 1973 and its additional Annexes (MARPOL 73/78) plus at least 12 other conventions and protocols dealing with the prevention of pollution from ships, liability, compensation, intervention, oil pollution preparedness, response and cooperation. In addition to the United Nations Convention on the Law of the Sea (UNCLOS), Vanuatu is a signatory to two environmental conservation treaties. Apart from minor provisions in the Maritime Regulations [Regulations 25, 26 and 27], the Ports (Operations in Port of Port Vila) Regulations [Regulation 24] and the Ports (Operations in Port of Luganville) Regulations [Regulation 34], scant attention is given to marine pollution and environmental matters. Chapter 283, the Environmental Management and Conservation Act, provides for national policies and plans for the conservation, sustainable development and management of the environment, at the Minister's behest. Such policies and plans concerning marine pollution and the marine environment are absent.

1031. Marine pollution and the marine environment are areas where Vanuatu legislation remains silent. This needs to be rectified and the proposed Sea Transportation Bill (Act) is the most appropriate place for these provisions.[112] Accordingly such provisions are included in the Sea Transportation Bill (Act). These provisions are not only needed as a consequence of Vanuatu's accession to MARPOL and various other international maritime law instruments concerning the protection of the environment but also it is important to the Vanuatu international shipping register to have such legislative backing.

1032. Vanuatu will need to implement the standards and requirements of the various international law instruments concerning oil pollution and the marine environment. It is not the task or responsibility of the MSA to do this but rather the MSA has the responsibility for ensuring that Vanuatu complies with these requirements and standards. If it cannot or is unwilling then there is a strong case for suggesting that Vanuatu should renounce or surrender its membership of the relevant conventions, protocols, *etc*.

1033. Vanuatu urgently needs to decide what action it is willing to take and what action it is able to take for the prevention of marine pollution and protecting the marine environment. This is a Government decision.

1034. So, in practice the harbourmaster is the chief safety regulator for the port in which he or she is located and those adjacent areas, waters and seas.

7.12.7 Personnel Licensing

1035. Seafarers are required to hold certificates of competency appropriate to their role and function. To achieve certification seafarers must be able to demonstrate a level of knowledge to certain standards, meet sea services plus meet sea service and age requirements. The knowledge is demonstrated by passing examinations that reflect an approved syllabus of training that should

[112] Environmental protection is transport or economic requirements as opposed to safety requirements and so belong to a Sea Transportation Act rather than a Maritime Safety Act. These requirements could be provided for in a separate Act but it is more useful to collect together in one Act all matter pertaining to the transport or economic requirements of the sea transport system. This is the approach taken in (other) developed maritime nations within the region.

realistically cover the knowledge, functions and skills required to perform certain seafarer ranks or tasks. Training and certificates of competency should comply with STCW standards for international seafarers and it is highly desirable that these same or similar standards are applied for domestic seafarers.

1036. The Vanuatu Maritime College located at Luganville trains seafarers and carries out examinations for certificates of competency. It is proposed that the small Personnel Licensing Unit of the MSA be based at Luganville and consists of a Licensing or Certification Officer and a Registration Clerk. The functions of this unit are to carry out what is effectively safety oversight of the training of seafarers, the examination process for the granting of certificates of competency, the revalidation of certificates as time passes as well as maintaining a Register of Seafarers. The unit would also conduct investigations into the competency of seafarers prior to the granting of certificates and where such an investigation is required following safety oversight activities by the Ship Operations Unit.

1037. The Personnel Licensing Unit would work closely with the Vanuatu Maritime College and the Ship Operations Unit.

7.12.8 Administration

1038. It is proposed that the MSA have an administration officer located at each of Port Vila and Luganville to carry out the usual and important functions to do with human resources and the payroll. The administration officer would also provide administrative support to the Director and Deputy Director respectively.

7.12.9 Recommendations

1039. Because of the division of tasks between Port Vila and Luganville it will be important for MSA's senior management to develop, implement and maintain effective internal communications within and between each of the units and especially between Port Vila and Luganville. In order to facilitate this it is suggested there be a staff meeting each month that alternates between Port Vila and Luganville. In addition each week all staff within each port should meet formally with the minutes of the meeting distributed to the other port.

1040. As for the DPM, an early task for the director should be to develop a training programme to ensure all staff remain current with developments within the maritime system. To enable staff to obtain an overview of the Vanuatu maritime system and to prevent 'regulatory capture' it is will be important to switch staff between Port Vila and Luganville from time-to-time.

7.13 Maritime Fund

1041. The proposed Sea Transportation Act makes provision for the establishment of a "Maritime Fund" to receive funds that may be provided by Parliament for the purposes of shipping, ports, marine environment, *etc*, as well as to receive all monies earned from fees and charges (especially from ports and ship registration), various investments, leases acquired or vested in the MIPU or the national maritime administration or other government department. To begin with revenue from the present activities of the Department of Ports and Harbours brings in about Vt 120 million a year and that from the international shipping register in the order of Vt 40 million per year – this is a substantial amount.

1042. Such a Maritime Fund should replace the two trust accounts known as the 'Vanuatu Maritime Services Fees Account' and the 'Maritime Participation and Investigation Fund' as well as provide for the (other) purposes of the three new Acts.

1043. Presently under an agreement between the Government and VMSL a trust account, known as the 'Vanuatu Maritime Services Fees Account' has been established for the sole purposes of receiving all fees and monies due under 'Maritime Law'. Under Maritime Regulations Order No 25, Regulation 29 there is provision for the payment of certain costs from this trust account, which includes amongst other things the costs of:

- the Government of Vanuatu's membership and participation in the international maritime conventions, agreements, organisations to which Vanuatu is a party or member;
- the prevention and treatment of maritime pollution and environmental nuisances; and

- maritime safety and the prevention of maritime potential risks and accidents in the maritime transport industry.

1044. Under the same agreement between the Government and VMSL a separate trust account, known as the 'Maritime Participation and Investigation Fund' has also been established (only) for maritime matters connected to the international shipping registry in accordance with Maritime Regulation 29 and for the costs of investigations carried out by VMSL on behalf of the Government [Flag State] and also for the costs of vocational training for ni Vanuatu seafarers.

1045. These funds seem to have been administered by the now disbanded Vanuatu Maritime Authority on behalf of the Government of Vanuatu. VMSL continues to make payments into these trust funds, which are presumably now administered by the MFEM. As noted in paragraph 950 above there seems to be an (unnecessary) aura of haziness or elusiveness about the administration of these trust accounts, except on the part of VSML who appear to be fulfilling their contractual obligations.

1046. The establishment of one Maritime Fund to provide for the purposes of shipping, ports, marine environment, *etc*, would create a substantial fund that, applied wisely within the maritime industry, would in turn benefit the economic and social wellbeing of the people of Vanuatu. It needs to be recognised, however, that income from berthage and wharfage do not cover the full cost of providing wharves and port storage facilities. It is unlikely that these charges would ever be able to fully recover these capital costs. So the Maritime Fund would only be able to make a contribution to funding the maritime system.

7.14 Vanuatu Register of Ships

1047. The Phase II review of the legal framework proposes the establishment of three new Acts: Sea Transportation Act, Maritime Safety Act and the Ship Registration Act. Altogether they would result in a complete revision of ship registration in Vanuatu recognising the economic and safety requirements of the Vanuatu Maritime system and in particular those of the Vanuatu sea transport system. Chapter 5 details these proposals and *section 6.13* deals with the proposed Ship Registration Act. The *objective* being to provide for seamless transitional arrangements between the provisions of CAP 131, the Maritime Act and the new Act.

1048. As far as the Vanuatu international shipping register is concerned what is immediately required is:

- the appointment or ratification of the Registrar of Ships;
- the establishment or ratification and notification of the Vanuatu (International) Shipping Registration Office;
- the delegation of authority or the ratification of the process for the provision of Flag State control over ships seeking registration or are registered on the Vanuatu international shipping register;
- the ratification of the role and functions of VMSL as the Maritime Administrator; or
- the clarification of interim arrangements concerning a Commissioner of Maritime Affairs and the Registrar of Shipping.[113]

1049. *Section 7.9.3* discusses future arrangements for the registration of ships. For the sake of completeness the following paragraphs outline transitional arrangements for ship registration.

1050. The proposed Ship Registration (Bill) Act is based on a number of policy assumptions. The first is that the Vanuatu ship register will consist of two parts:

Part A: providing for the registration of ships currently eligible for registration under section 17 of CAP 131, the Maritime Act; and

Part B: providing for the registration of ships currently required by the Shipping (Registration of Shipping) Regulations under the authority of CAP 53, the Shipping Act.

[113] Amendments to CAP 131 are presently under way to clarify and rectify the delegations of power to key persons. Essentially the 'Minister' replaces the 'Authority'. The powers of the Minister to make rules and regulations are clarified and subject to the approval of the Council of Ministers may appoint a Commissioner of Maritime Affairs and Deputy Commissioners.

1051. It also assumes that the administration of the Vanuatu open register will continue under contract with VMSL. The role of VMSL is essentially to maintain complete and accurate records of documents relating to the administration and operation of the Vanuatu open register; maintain experienced and appropriate staff and facilities for the administration of the register; collect fees on behalf of the Gov; and, make payments to the GoV.

1052. It is assumed that the following additional policies will apply:

(a) the establishment of a Registrar of Ships;

(b) that the Registrar of Ships will be responsibility for ensuring the proper maintenance and control of the Vanuatu ship register, both Part A and Part B; and

(c) that the Minister responsible for sea transportation and maritime affairs may, with the approval of the Council of Ministers, appoint an organisation to maintain the register or any part of the Register (which is a continuation of CAP 131 provisions).

1053. One matter that cannot be overlooked, especially where the original objective in establishing a Vanuatu open register was revenue generation, is that ships so registered are Vanuatu 'nationals' and as such enjoy the protection and benefits of Vanuatu law. Accordingly there are sovereignty interests attached to the open register so that the activities of ships on Vanuatu's register impact on Vanuatu's international reputation.

1054. There is more than one approach to drafting a new Ship Registration Act. One is to simply to take Parts 4 and 5 from CAP 131, the Maritime Act, and transplant them directly into the new Act, which would provide for the open register or Part A. Provisions for the establishment of what is effectively the 'domestic register', as currently provided for in the Shipping (Ship Registration) Regulations but suitably enhanced, could then be added. This would have the advantage of being a 'quick fix' and possibly a seamless transition. But it would not improve provisions for the administration and operation of the Register.

1055. A second approach would be to start again, which might result in cumbersome transition provisions, take longer and cause some concern or wonderment within the international shipping community. This approach, employing top class technical advice, could, however, provide Vanuatu with a ship register second to none – it is more than 28 years since the Maritime Act was drafted and in the intervening period there have been many advances, especially in international financial transactions and international maritime law instruments.

1056. A further or third approach could be somewhere in between these two approaches where the essential elements of CAP 131 are incorporated into the new Act but updated and enhanced to take account of developments over the past 30 years or so – and incorporate provisions for 'domestic shipping'.

1057. It is suggested that the third approach be adopted and that technical assistance be engaged at the outset. *Appendix 6.4* outlines fundamental requirements that should be provided for in a Ship Registration Act.

7.15 Industry Capacity Building

1058. The terms of reference call for recommendations concerning on-the-job business development training for ship owners and operators. Much as this would improve the ability of owners in understanding the financial and commercial management of shipping in a Vanuatu environment, it is considered that this may be premature or even counterproductive during a period in which the industry is about to or will be engaged in major restructuring and institutional strengthening initiatives involving both the safety and economic requirements of the sea transport system.

1059. Furthermore there are well informed views within the industry that consider owners who already have a good basic understanding of financial and commercial management of shipping might attend but those for whom it would be beneficial are most unlikely to attend. The latter owners operate on a 'hand-to-mouth' basis and would be unlikely to want to find the time to participate.

1060. Nevertheless, while it is recommended that no specific business development training be set up for ship owners and operators in the short term, the matter be given further consideration once major restructuring and institutional strengthening initiatives have been underway for a short period (year or so) and their impact on the likely benefits from on-the-job business development training for ship owners and operators can be better assessed.

8. Financial Management

The MFEM has implemented a financial management system that is generic to all government Ministries in Vanuatu. This system and associated Government of Vanuatu (GoV) policies, procedures and delegated authorities under which the MIPU operates its financial systems were reviewed to identify capability and capacity to support project related funding and financial management requirements, including reporting and control.

The review concluded that:

- **MIPU's share of overall GoV annual expenditure is significant, accounting for 9.79% of all GoV budgeted expenditure.**
- **Policies and procedures were clear, unambiguous, focused on the control and accounting for government revenue inflows and expenditure outflows, and adequate for GoV operations if followed as intended; however, existing systems do not have sufficient report and control mechanisms to isolate all large project-related expenditure (*e.g.* labour, materials, etc).**
- **There are some variations between written directives and those actually being performed by the MIPU that were the result of improvements to procedures arising from new information technology introduced but yet to be amended in the directives.**
- **The GoV has adopted the International Accounting Standards and applied them in its reporting.**
- **Added cost savings could result by amending communication procedures to Ministry offices outside Port Vila.**
- **The Audit Office has not audited MIPU during the last ten years and this needed to be rectified.**
- **Tariffs and prices for goods and services urgently require updating from which the GoV could annually recoup an estimated Vt 33 million.**
- **The financial management system is sufficiently flexible to provide information reports for individual budgeted programs as long as these are based on the established Chart of Accounts and the Ministry of Finance and Economic Management has approved each along with the new budgeted program.**
- **The larger infrastructure jobs are contracted out leaving the MIPU to undertake many very small and emergency repairs amounting to Vt 90 million per annum per province. The volume and value of these small jobs (mainly local labour costs) do not warrant expenditure on a Job Costing Software System and while technically possible and would be very expensive to intervene in the MEFM system to provide MIPU with such an application.**
- **The majority of the key financial staff hold appropriate tertiary qualifications and have been in their position for at least ten years.**

To improve financial management and mitigate risks the following institutional and capacity building assistance is recommended that:

i) donor technical assistance (estimated at Vt 13.712 million) be sought to reinvigorate and re-establish an internal audit section in the Auditor General Office so that annual audits of government ministries are performed annually; [see section 8.6.1]

ii) in the absence of supporting systems and lack of capacity at the MIPU an "Engineer" be engaged to oversee the quality construction of any major infrastructure work, to manage and account for the flow and disbursement of investment funds, and to provide "on-the-job" training to MIPU staff; to cover this a cost of Vt 27.724 million has been included in the capital construction costs of South Paray Wharf [s8.7.2]

iii) donor technical assistance (estimated at Vt 7.428 million) be provided to improve communications and reporting throughout government Ministries and to reduce the costs of operation; [s 8.5.4]

iv) donor technical assistance be provided to revise and update existing international port and water tariffs (to recoup Vt 16 million and Vt 9 million respectively); and to establish ship and cargo operations performance measures [s8.5.1]

v) donor technical assistance (estimated to cost Vt 4.606 million including work of updating the tariffs) be provided to review GoV debt policies to improve the GoV fiscal position (by Vt 15 million annually) including the application and enforcement of penalties [s8.5.2. s8.5.1]; and

vi) donor technical assistance (estimated at Vt 20.608 million) be provided to implement an inventory software system for the GoV; [s8.6.4].

The financial evaluation of the sub projects (Port Vila domestic wharf, outer island jetties, capacity building and shipping support schemes) found that;

a) the financial impact in 2012 on the GoV after taking account of all the cash flows from the proposed infrastructure, reorganization of the MIPU, tariff and debt adjustments but excluding infrastructure without existing identifiable revenue to support the sub projects, amounts to a surplus of Vt 49.2 million. By 2017 the year prior to the commencement of loan repayments the cash flow surplus amounts to Vt 59.8 million. [s 8.8]

b) In 2018 as loan repayments commence the cash flow surplus reduces to Vt 10.7 million; but is conditional upon achieving increases in the international port tariff, MIPU water tariff plus improved debt recovery (but without increases in Slipway or South Paray wharf charges); if these improvements are not achieved there would be a cash flow deficit of Vt 29.3 million per year. [s 8.8]

Based on the financial evaluations it is recommended that:

1. South Paray Bay wharf for domestic shipping and a slipway be proceeded with, at an estimated construction cost of Vt 815 million for South Paray Wharf [s8.7.2] and Vt 152.1 million for the Slipway [s8.7.5];

2. a program of regular but minimal price adjustments for both international and domestic wharves be implemented to ensure the GoV fiscal position is not compromised when loan repayments commence; [s8.8]

3. priority be given to existing infrastructure requiring urgent repairs while other subprojects without associated revenue be considered commensurate with the GoV's ability to support future loan repayments; [s8.7.4 to s8.7.9] and

4. the GoV continue to provide annual funding to support the Shipping Services Support Scheme and that the amount to be funded reassessed annually in advance. [s8.9 and s8.10]

The following table summarises funding requirements and their source for new infrastructure, rehabilitation and repairs, shipping support and capacity building [Table 8.20]:

	Loans Draw Down		Capacity Building Donor					GoV					Report Reference
Year	2010	2011	2010	2011	2012	2013	2014	2010	2011	2012	2013	2014	Chapter
New Infrastructure (000)s	Vt	Vt	Vt	Vt	Vt	Vt	Vt	Vt	Vt	Vt	Vt	Vt	
Port Vila - South Paray Wharf	438,431	376,565											8.7.2
Loltong	192,653												8.7.9
Other Outer Islands (3)	377,605												8.7.6
Sub Total	**1,008,689**	**376,565**											
Rehabilitation and Repairs													
Litzlitz	73,118												8.7.7
Simonsen	384,008												8.7.4
Lenakal	96,182												8.7.8
Slipway	152,068												8.7.5
Sub Total	**705,375**												
Shipping Support													
Shipping Support Scheme Estimates								**4,440**	**4,440**				8.9 & 8.10
Shipping Coordinator			**7,273**	**7,273**	**7,273**	**7,273**	**7,273**						Chapter 1
MIPU Organisational Restructuring								**10,000**	**10,000**	**10,000**	**10,000**	**10,000**	
Capacity Building													
Internal Audit			13,712										8.6.1
Inventory				11,008	9,600								8.6.4
Engineer PMU South Paray Wharf **(Note 1)**													
Environment Soth Paray Wharf **(Note 1)**													
Tariff Update			4,606										8.5.1
Communication & Reporting			7,428										8.5.4
Environmental Training & Capacity Building			28,713	28,713									Chapter 7
Coordinator Shipping			5,424										Chapter 1
Law Technical			17,511	17,511									Chapter 6
MIPU DPM Safety Regulator			18,600	18,600	18,600	18,600	18,600						Chapter 7
Sub Total			**95,995**	**75,832**	**28,200**	**18,600**	**18,600**						
Totals	**1,714,065**	**376,565**	**103,268**	**83,105**	**35,473**	**25,873**	**25,873**	**14,440**	**14,440**	**10,000**	**10,000**	**10,000**	
US$ million	**17.141**	**3.766**	**1.033**	**0.831**	**0.355**	**0.259**	**0.259**	**0.144**	**0.144**	**0.100**	**0.100**	**0.100**	
Capacity Building Additional Revenue Vt (000)s			**20,000**	**40,000**	**40,000**	**40,000**	**40,000**						

Note 1: These costs are included in the Port Vila South Paray Wharf project administration estimates

8.1 Government Financial Policies

1061. The Government of Vanuatu (GoV) policies and procedures under which the financial systems operate are found in the following documents:

- Chapter 224 Public Finance and Economic Management Act 1998 and amendments;
- Chapter 245 Government Contracts and Tenders Act 1998 and subsequent revisions;
- Tenders Regulations 1999; and
- Finance Regulations 2000 and subsequent revisions, which contain the detailed financial procedures that are to be applied in the public sector.

1062. In 2002, the GoV installed an integrated computerized and centralized financial management system, which is based on accrual accounting practises and is now used by all ministries.

1063. The GoV 2009 budget totals Vt14.095 billion. *Table 8.1* summarizes the 2009 budgeted expenditure by respective ministry and offices and the Chart of Accounts identifier code for each.

Table 8.1: **Budget Expenditure 2009 by Ministry and Government Office**

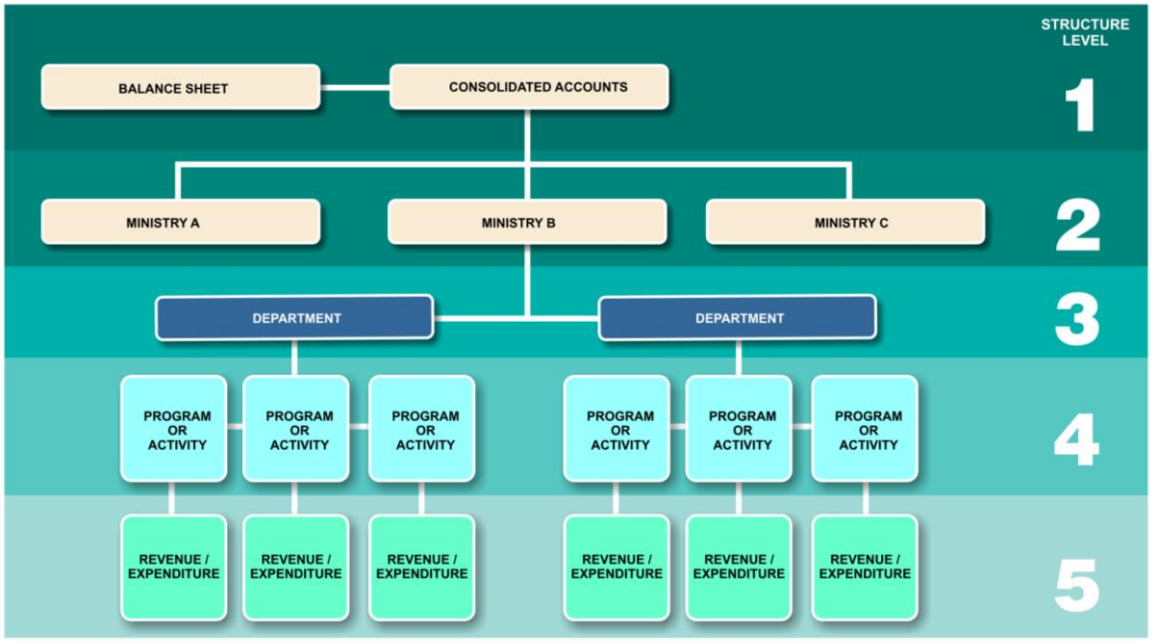
Ministry	Code	Vt	NZ$	%
Presidents Office	CA	45,169,407	674,170	0.32%
Parilament	CB	463,555,813	6,918,743	3.29%
Judiciary	CI	177,431,409	2,648,230	1.26%
Malvatumauri	CD	31,963,915	477,073	0.23%
National Audit	CE	33,050,534	493,292	0.23%
Ombudsman	CC	52,260,931	780,014	0.37%
Public Posecutor	CG	37,094,042	553,642	0.26%
Public Solicitor	CH	38,223,484	570,500	0.27%
Public Service Commission	CJ	110,608,242	1,650,869	0.78%
Judicial Services Commission	CL	889,186	13,271	0.01%
State Law Office	CF	71,758,609	1,071,024	0.51%
Citizen Office	CK	4,117,321	61,453	0.03%
Prime Ministers	MC	177,740,817	2,652,848	1.26%
Agriculture, Quarantine Forestry & Fisheries	MA	381,182,220	5,689,287	2.70%
Commerce, Industry & Tourism	MT	260,823,262	3,892,885	1.85%
Cooperatives & Ni- Vanuatu Business Devel	MV	123,146,717	1,838,011	0.87%
Education	ME	3,210,459,357	47,917,304	22.78%
Finance & Economic Mgmt	MF	3,836,078,263	57,254,899	27.22%
Foreign Affairs	MO	266,787,741	3,981,907	1.89%
Health	MH	1,450,109,521	21,643,426	10.29%
Infrastructure & Public Utilities	MU	1,379,906,590	20,595,621	9.79%
Internal Affairs	MI	1,318,507,755	19,679,220	9.35%
Lands, Geology & Mines	ML	318,382,104	4,751,972	2.26%
Justice & Social Welfare	MJ	202,148,609	3,017,143	1.43%
Youth Development & Training	MY	103,796,698	1,549,204	0.74%
Total Budget		**14,095,192,547**	**210,376,008**	**100.00%**

8.2 Financial Management Systems

8.2.1 System Structure and Chart of Accounts

1064. The MIS system has been established by the MFEM and is solely focused on expenditure and budgetary control, hence the addition of incompatible software has occurred in recent years to try and fill information gaps (later discussed); *Figure 8.2* illustrates the Chart of Accounts (CoA). The CoA forms the basic structure of the MIS that enables the sorting of accounting transaction information into a series of lists that can then be printed into predetermined standard report formats. There is sufficient flexibility for the addition of any number of cost centres, activities, or functions that can be established at structure level 4 and corresponding additional expenditure accounts at structure level 5. The addition of new cost centres or new accounts is decided by each individual ministry, who must first inform Ministry of Finance and Economic Management (MFEM) and obtain their approval to establish the new cost centre or account. The MFEM has the sole responsibility to establish new master files. The creation of new cost centres or activities is a decision taken when budgets are being compiled and the need for an additional cost centre is identified. The system will not accept information entered if a master file has not been established, since to do so would result in transaction data is entered that does not total to the control batch sum.

Figure 8.2: **An Overview of the Structure of the Chart of Accounts**



1065. A common CoA and structure is used by all ministries in Vanuatu; the coding is alpha-numeric. Each ministry can under the existing structure obtain management reports by month and year to date, detailing revenue and expenditures for any activity established at level 4. Sub ledgers in the system, i.e. Accounts Payable and Receivables, service all government functions. A complete Balance Sheet Statement is only available at the consolidated accounts level but elements of it can be provided for some of the balance sheet items to level 4, i.e. fixed assets.

1066. The COA structure shown in *Figure 8.2* and are applied in all ministries is as follows:

MU The first two alpha codes identify the ministry at level 2. For example, the MIPU is identified as MU, whereas other ministries commence with other alphas as listed in Table 8.1.

MUA The third alpha code, corresponding to level 3, identifies a function or department with the ministry, e.g. Ministerial Cabinet Support (MUA) or Public Works (MUF).

MUAA The fourth alpha code identifies a program within a function, i.e. Portfolio Coordination. If required, a numeral can be added, i.e. MUAA1 or MUAA2 etc. that identifies another location or sub-function. For example, public works development and maintenance at Lenakel Wharf in Tanna. These are illustrated as level 4 in *Figure 8.2*.

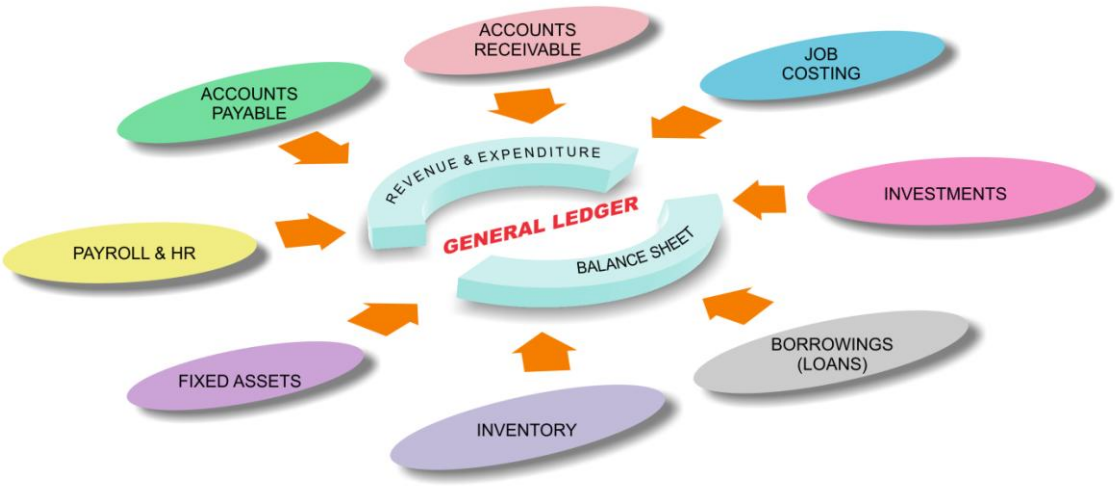
The fifth and sixth code, which can be either numeric or alpha, identifies groups of revenue or expenditures; i.e. MUAA8A, MUAA8C, MUAA8D, MUAA8E, MUAA7L, MUAA7N and MUAA7Q. The first to last in this series of alpha numeric sequence are (8A) salaries and allowance; (8C) recurrent charges such as fuel, hire cleaning etc; (8D) transfers to municipalities, colleges etc (8E) capital expenditure, (7L) Revenue Commercial Charges, (7N) Disposals/Fees and (7Q) Donor Contributions. Additional alpha codes provide a further breakdown into individual accounts.

1067. The Balance Sheet applies the same coding structure to identify Assets and Liabilities.

8.2.2 The Financial Management System

1068. *Figure 8.3* provides an overview of a computerized integrated financial management system.

Figure 8.3: **Overview of an Integrated Financial Management System**



1069. The sub-ledgers such as the Accounts Payable contain detailed information of transactions that are summarized into the General Ledger from which financial management reports can be produced.

1070. The existing GoV integrated management information systems contains most of these sub-ledgers, however, not all of these were implemented when the MIS was established in 2002. Different software to provide for recording of Fixed Assets has since been added. Job Costing, Inventory, Investments and Borrowings sub-ledgers have yet to be installed and it may not be possible to integrate these with the original software. If these additions provide outputs that provide value for money it is highly likely that rather than different software the whole system software may require replacement. Only a few ministries have inventories of any significance; such as that of the Ministry of Health where a manual inventory system is used to control medicines and drugs and is not available online. The MIPU does not hold an inventory and large purchases are coded into capital projects accounts. The cost of capital investment projects result in an asset in the Asset Register (see Assets and Procedures below).

8.2.3 Planning and Budgeting

1071. The prescription and requirements for Planning and Budgeting is set out in Part 5 of the Public Finance and Economic Management Act (PFEMA); and in Part 12 of the Finance Regulations (FR). With GDP and revenues rising, the GoV has been able to increase ministry budgets and programs in recent years. The PFEMA requires the Minister provide a budget to the Council not less than 14 days prior to the introduction of an Appropriation Bill. It must contain detailed estimates of revenue, expenditures, the State's debts and the plan to meet such debt responsibilities. In addition to the budget, the Minister must provide a detailed forecast for the next two subsequent years to the year of the budget estimate.

1072. The FR under Part 12 sets out the Budget timetable and requirements, which is shown in *Table 8.4*.

Table 8.4: **Budget Timetable Per Financial Regulations**

Item	Date	Description
1	Mid May	Changes in revenue and expenditure forecasts for the current year due from ministries and agencies for inclusion in the Half Year Economic and Fiscal Update.
2	End May	New project submissions and Government Investment Program (GIP) submissions for the budget year due.
3	Mid June	Half Year Economic and Fiscal Update for the current year to be published by MFEM.
4.	End of June	Budget Policy Statement to be published by MFEM; and Director General of MFEM to issue budget instructions to Ministries.
5.	Mid August	Budget returns due from Ministries; and Budget Review starts.
6.	End of September	Budget reviews to be completed; Adjustments to be made to budgets from the review; and Draft budget to be printed and forwarded to the Council of Ministers (COM) for review.
7.	Mid October	Amendments from COM review to be made; and Budget books to be printed and forwarded to Members of parliament.
8.	November to December	Session of Parliament to debate the Appropriation Bill begin.
9.	Early December	Ministries and agencies to provide monthly cash-flow forecasts of their revenue and expenditure requirements.

1073. The procedures described in *Table 8.4* are generally adhered to by the MFEM and other ministries, although in practice the process has some sequential and timing variations.

1074. Before the MFEM issues guidelines and directives to ministries for budgeting, each ministry submits a list of capital items or new programs for inclusion in the budget. This enables the MFEM to gauge the demand for funds in the forthcoming year. Annually in May, the MFEM provides guidelines and directives to each ministry.

1075. The MFEM advises each ministry by June how much the budget will be increased for the year subsequent and the number of new program or activity items approved for inclusion in the forthcoming years budget. Programs or activities that are to be discontinued or are no longer required are taken out. The MFEM provides direction and assistance to other ministries by prescribing the format under which programs, activities, output and inputs, outcomes and performance measures are assembled and submitted. With this information in place the budget policy statement can be formulated.

1076. The budget policy statement must cover the next three years. The prescription for the information budget policy statement must address is set out in the FR, Part 12.6.

1077. The Finance Officer of each ministry shares out increases or decreases across all the recurrent expenditure based on the prior year's budget allocations. The total of each budget line item is then entered into the financial system ready for when the next financial year commences. If budget funds are not spent or committed by the end of the financial year, the funds or allocation is not carried forward to the next year.

1078. Since January 2008, AusAID have funded the Governance for Growth (GfG), which to a large degree builds off the reform efforts of the ADB's Comprehensive Reform Project (CRP) and is focused on assisting the GoV improve coordination of the budget process in terms of ministry input and outputs.

8.2.4 Cash Flow Forecasts

1079. Every month during the current financial year, each department head provides a projection of their expected revenue and expenditure for the next two months. This is summarized into a statement for each ministry by the Finance Officer and forwarded to the MFEM.

8.2.5 Delegation of Authority

1080. Part 3 of the FR states that the head of a ministry has the financial authority to approve all expenditures for the ministry within the following limits:

- At the levels passed by any Appropriation Acts for the relevant financial year;
- Any other amounts authorised by the Minister of Finance by a warrant under his hand; and
- All expenditures approved for payment must be within:
  - the program or output budgets specified and voted in any Appropriation Acts or warrants,
  - a Ministry's program budgets after any transfer made under Section 34 of the PFEM Act, and
  - must be spent for the purposes intended in the budget to achieve the program, activity or output objectives.

1081. The FR set out the procedural requirements for the purchase of goods and services, which are presented in *Table 8.5*.[114]

Table 8.5: **GoV Delegated Authorities**

Item	Amount	Procedure
1.	Less than Vt100,000	An officer with an appropriate financial delegation must approve the purchase order form for the goods or services, and he or she must ensure that the cost is reasonable.
2.	Vt100,000⇒Vt1 million	An officer with appropriate financial delegation must approve the purchase order form for the goods or services, and two quotations must be obtained wherever possible.
3.	Vt1 million⇒Vt5 million	The purchase order form for the goods or services must be approved by the Head of Ministry, i.e. Director General (DG) or confirmed delegate), and three written quotations must be obtained wherever possible.
4.	Greater than Vt5 million	The Government Contracts and Tenders Act 1998 and the procedures set out in the Tenders Regulations must be followed.

1082. Expenditure for entertainment and overseas travel whatever the amount can only be approved by the DG.

1083. Delegated authorities are not widely spread within the MIPU. Only twelve officers have delegated authorities to commit the MIPU and the government to purchases for goods or services. The majority of these delegated authorities restrict the holder to transactions of less than Vt100,000. No MIPU Officer outside of Port Vila has a financial delegated authority. All delegated authorities are notified to the MFEM. All withdrawals of delegated authorities must be in writing and also advised to the Director of Finance in the MFEM.

1084. Directives are in place to ensure that purchases cannot be split to avoid the tendering or Director General's approval, i.e. payment by instalment.

1085. In the MIPU, only the Finance Officer (FO) raises and prints the Local Purchase Order (LPO) commonly used by government to purchase goods or services throughout Vanuatu. The FO checks to ensure the delegated authority exists for the person approving the purchase and that there is

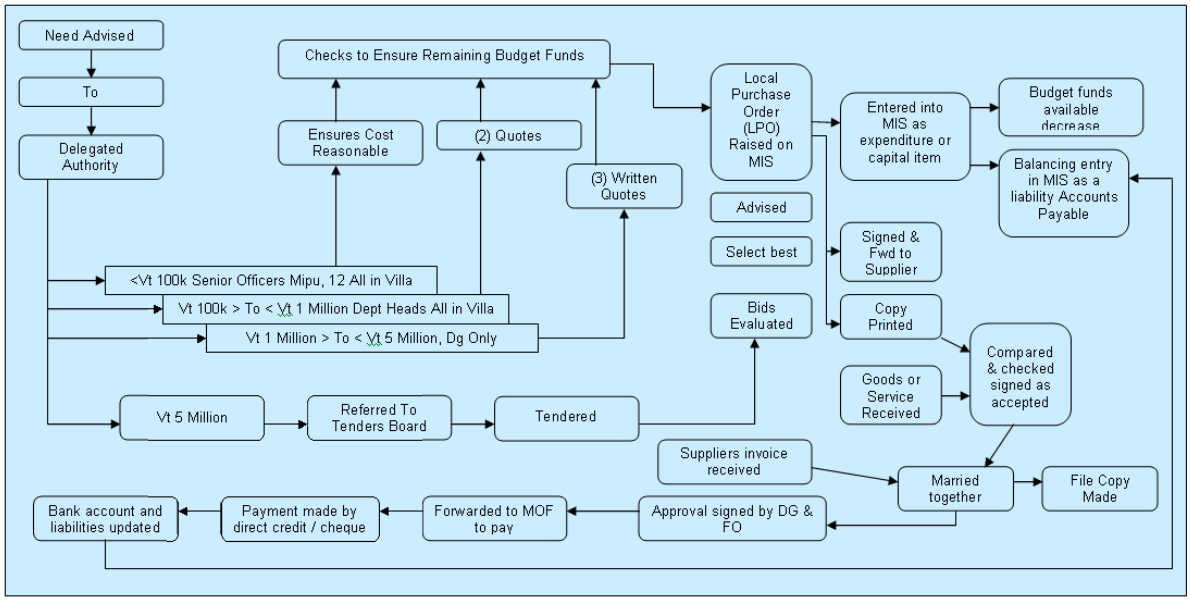
[114] The Financial Regulations, Division 1 (Purchasing Goods and Services), Regulation 5.14(3) (Placing an Order for Goods and Services).

sufficient budget funds remaining. The LPO is then printed, signed by the FO, and forwarded to the selected supplier.

8.2.6 Procurement and Accounts Payable

1086. Part 5 of the FR deals with purchasing, approvals, and payment of goods and services. Since these were approved in 2000, the application of computer technology has introduced some variations. The use of delegated authorities has been outlined in the prior paragraphs and forms the basis of the procurement of goods and services procedure. *Figure 8.6* illustrates the current procedure practiced in each ministry from the instance of identifying a need, application of the delegated authority, and raising a LPO to making payment of goods and services purchased.

Figure 8.6: **Government of Vanuatu Procurement and Accounts Payable System**



1087. The first step in procurement is to have a need approved by a person with the required level of delegated authority. There are only twelve persons in Port Vila that can approve purchases up to Vt100,000. Heads of Department can approve up to Vt1 million and for amounts less than Vt5 million, and only the Director General can approve the higher valued purchases. Approvals will only be given if funds have been budgeted and sufficient funds remain to cover the purchase.

1088. All purchases over Vt5 million must be advertised and tendered. After receipt of tenders, the Tenders Board determines the successful bidder and places the order for supply.

1089. When the procedures set out in Part 5, Divisions 1 to 4, of the FR are compared with those illustrated in Figure 3 variations can be identified. For example, the MIS has replaced the need for "order books" that contained quadruplicate purchase order forms. These are no longer printed or used. Today, orders can only be printed from the MIS and only if the appropriate access and approvals have been entered. In this regard only each ministry's FO can raise a LPO on the MIS. Immediately when the LPO is raised and printed by the FO, the remaining balance in the budget is amended, and the expenditure entered as a transaction in the general ledger.

1090. The FR, Part 5, Division 2 sets out the procedures that cover approval of payment, authorisation of vouchers, payments from the official entertainment fund, and signing of accounting documents. The actual procedures are described below.

1091. A copy of the LPO is provided to those persons responsible for checking in the goods. The goods are inspected for condition and counted. The copy of the LPO is noted. On receipt of the invoice from the supplier for the goods or services, the LPO copy of the invoice is noted to verify the quantities and condition of the goods received are as ordered. The invoice and LPO are then married together for processing. The FO signs as correct and the DG counter signs the LPO before it is forwarded to the MFEM for processing payment to the supplier. The FO makes another hard copy for

the ministry's records should there be a need to look up information when the MIS cannot be accessed or is otherwise offline.

1092. The FR, Part 5, Division 3 sets out the processing of payments by data entry staff, credit entries, security of cheques and the loss or cancellation of issued cheques, whereas Division 4 provides detailed procedures for making payment to suppliers. Payments are only made by cheque or direct credit. The MFEM processes the payment and the liability that was created when the LPO was entered into the expense accounts, which is offset by payments made from the GoV bank account.

8.2.7 Payroll and Human Resources

1093. The GoV payroll is the single largest item of expenditure, accounting for nearly 60% of the total expenditure. A Salaries Commission determines salary levels for all government employees. Each ministry has a Human Resources Section whose function is to establish employee records on the government payroll system, account for all varieties of leave and advise the Payroll Department in the MFEM of employee attendance.

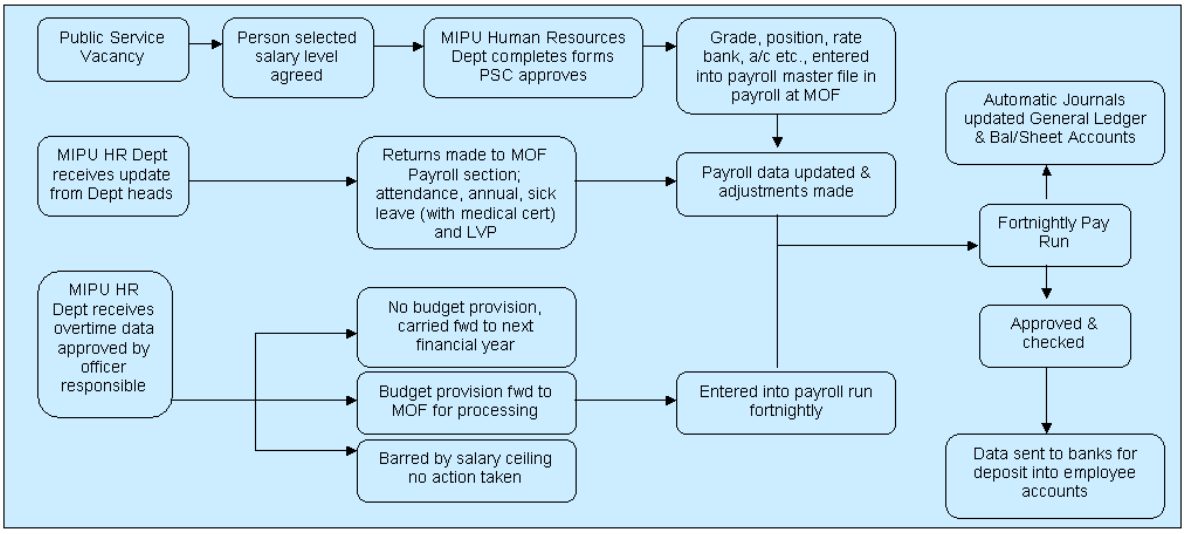
1094. Part 7 of the FR sets out procedures for the payment of salary, wages and deductions there from. *Figure 8.7* provides an overview of the employment and payroll system in the Vanuatu Public Service. There are three subsystems within the payroll as follows:

- appointment and engagement of personnel,
- the process of regular salary payments and agreed allowances, and
- processing and payment of overtime.

1095. All vacancies within the public service are advertised. The public service grade, salary and allowances are published for all interested parties to access. All appointments must be approved by the appropriate commission; whether it be public services, police, teaching, judicial or other with the authority to approve employment and salary levels.

1096. Following an appointment in writing, the Human Resources Manager completes the standard form that records the employee's personal details, salary level, allowances applicable, the person's location and bank account to enable a new master record to be established on the Payroll System. The form with appropriate authorisations is forwarded to the MFEM Payroll Department.

Figure 8.7: **An Overview of the Payroll System**



1097. Each employee completes a daily time sheet. Prior to each fortnightly payroll run, the Department Heads forward advice to the Human Resources Department of annual leave, sick leave, and leave without pay days taken by employees within their area of responsibility. This is forwarded the MOF Payroll Department and the "Standard Pays" are amended accordingly.[115] Government employee salaries are paid fortnightly.

[115] A standard pay is the set amount paid fortnightly to an employee under the terms of their employment.

1098. When overtime has been worked, the overtime hours for each employee are recorded, signed off by the section and department head and forwarded to Human Resources for processing. Three outcomes may result. One, if the budget for the year has no provision for overtime, the time and value is carried over until the next year. When the next year's budget is being formulated, provision is then made within the budget so outstanding overtime can be paid. Two, if funds still exist within the budget and remain unused, then the data is forwarded to the MFEM for processing with the current pay run. Three, some personnel receive a salary that excludes payment of overtime. In this case, any overtime claims are not actioned nor carried over to the next year if there is no budget provision.

1099. The Director of Finance or his nominee provides to each ministry DG, or his nominee, with a list of all payments made to employees within each ministry for each pay run. This is checked to ensure there are no ghost payments or errors.

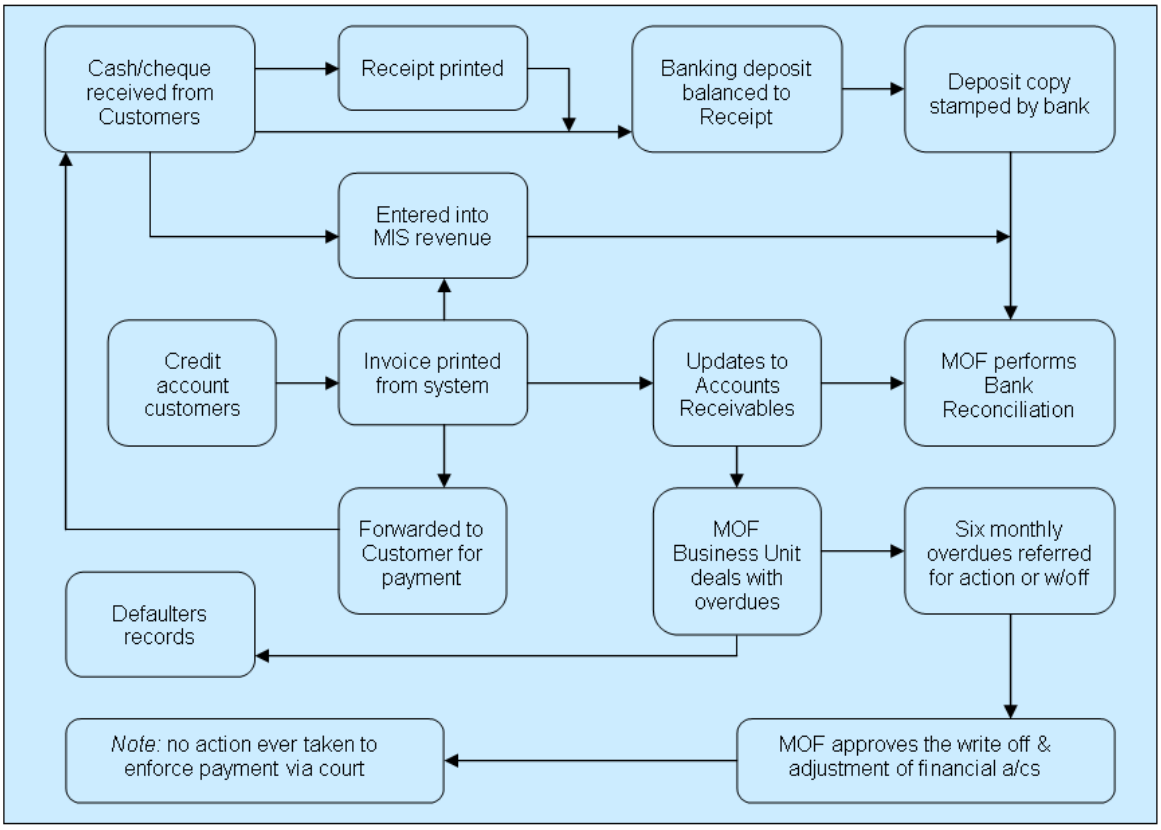
1100. All government employee salaries are paid into individuals' bank accounts following the process of each pay run. At the completion of each pay run and after reconciliation, the General Ledger transaction is updated by automated journals generated from the Payroll Ledger.

8.2.8 Accounts Receivable

1101. Based on the 2009 budget, the MIPU spent Vt1.4 billion, but based on the annual transactions flowing through the MIPU Accounts Receivable collected only Vt242 million of which the Department of Ports and Harbours (DPH) collected 80% of the total.

1102. The Accounts Receivable system and procedures is illustrated in *Figure 8.8*.

Figure 8.8: **Revenue and Accounts Receivable System**



1103. The FR, Part 8, Division 1 deals with procedures for receiving of money or cheques. The majority of GoV revenue is received in cash and is collected at one central point in each province and paid into a common account controlled and administered by the MFEM. Receipts are issued at the time of payment and the total of these must balance to the daily deposits made into the bank account. If revenue is received via post, then persons opening the mail must record the cash or cheques received prior to issuing a receipt and then deposit these payments received in the bank.

1104. FR, Part 8, Division 2, sets out detailed procedures for the issue of invoices to government customers. The Business Unit in the MFEM issues invoices to government customers that may have contracts with government for leases for premises, vessels, etc., or similar contractual arrangements. The DG of each ministry is responsible for the collection of debts. This function has been delegated to the Finance Officer in each ministry who follows up debts when customers default or do not pay on time. If attempts at recovery are unsuccessful, these customers are placed on a default list.

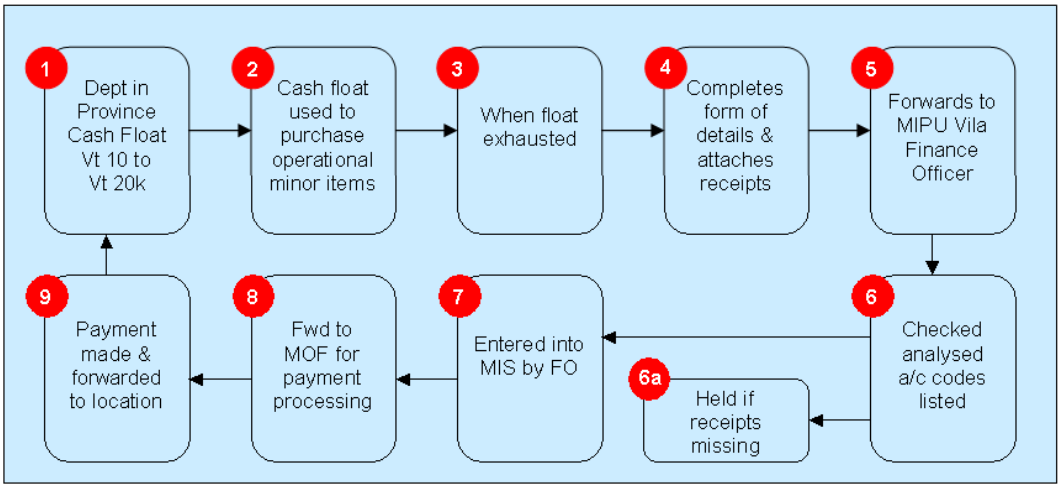
1105. After the elapse of six months, an overdue report is complied by each ministry and forwarded to the Director of Finance. The MFEM may write off the amount as unrecoverable and adjustments made to accounts payable and bad debts. To date, there is no record of any attempt to take enforcement action through the legal system or otherwise to recover outstanding debts against any person or enterprise.

1106. FR, Part 8, Division 3, deals with the safeguarding of cash, keys, facilities and receipt books. These are complied within the MIPU. Division 4 details procedures for the banking of revenue collected.

8.2.9 Imprests or Petty Cash System

1107. The Imprest or Petty Cash System; per Section 40 of the Public Finance and Economic Management Act are to effect payments where, because of the minor amounts involved, it is impracticable to make payment by cheque. Part 6 of the FR sets out the procedures for recording and accounting for petty cash and imprest accounts, which are illustrated in Figure 8.9. Each ministry has a number of petty cash floats depending upon its spread of operations throughout Vanuatu. In most cases, each float remains under Vt20,000.

Figure 8.9: **Petty Cash System**



1108. To obtain a “top-up” after the petty cash has been depleted, the local ministry officer responsible must complete a summary form and attached all the receipts for each petty cash item of expenditure and forward it to the FO. The ministry responsible and the MFEM will not action any top up if a receipt is missing. If the petty cash has to come from one of the more remote provinces or locations by boat or mail, it can take many weeks before the petty cash is replenished. All ministry FOs are encouraged by the MFEM to follow up any missing receipts or omissions quickly by the MFEM.

8.2.10 Inventories

1109. The FR do not contain procedures to account for inventories. Only a few ministries have inventories of any significance. Only the Ministry of Health drugs and medicine inventory has regular physical counts to determine any variation in the records of the inventory. Throughout the GoV, the management and maintenance of inventory records is weak and generally ineffective. The MIPU does not maintain an inventory nor has access to one on the MIS. The MIPU purchases materials and uses them for small maintenance jobs. The annual value and volume of materials and

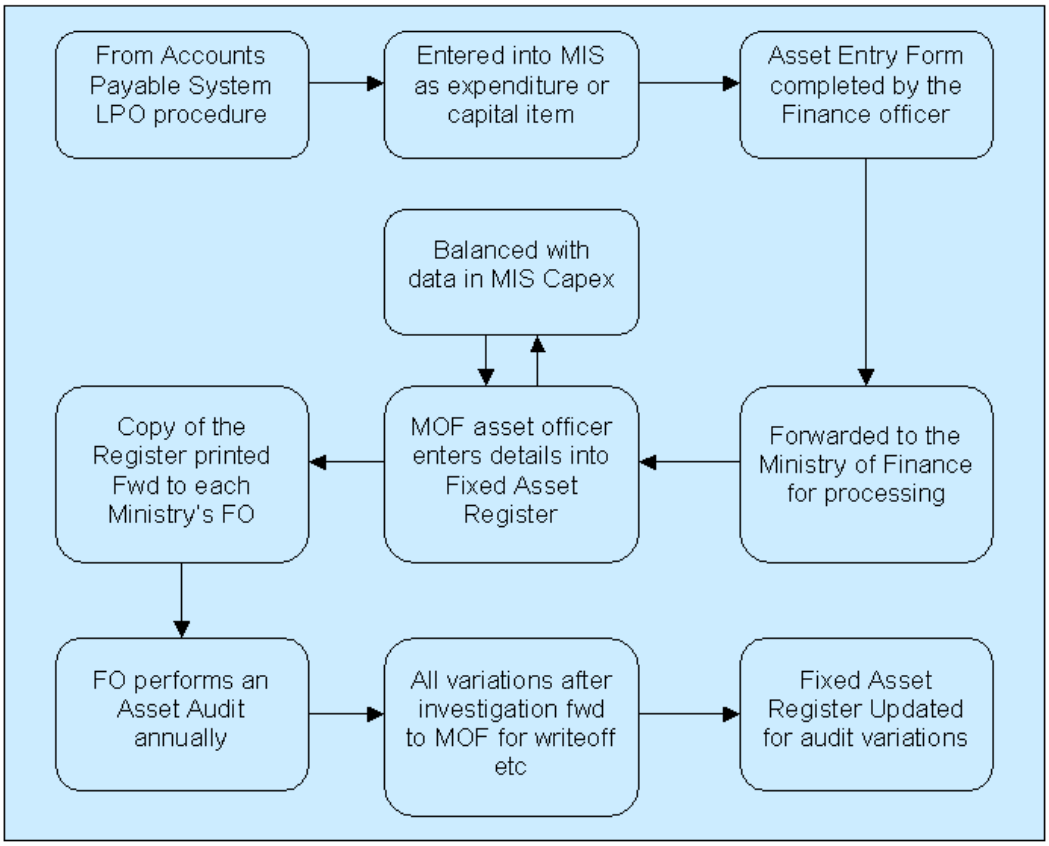
consumables is small and does not currently warrant the MIPU purchasing an inventory software system.

8.2.11 Fixed Assets

1110. The FR Part 9 sets out the procedures for recording and maintaining fixed assets. *Figure 8.10* shows the procedures applied for recording and maintenance of fixed assets. Each ministry has an Asset Register with comprehensive information on each asset, which contains among other descriptors the following:

- Asset number;
- Asset classification;
- Estimated useful life;
- Cost, depreciation, and net book value;
- Depreciation rate;
- Serial number;
- Condition;
- Date purchased;
- Supplier;
- Model or part number;
- Deportment; and
- Description.

Figure 8.10: **Fixed Asset Register System Procedures**



1111. Software that is not integrated with the MEFM information system has been used to establish the Asset Register. The Asset Register system uses an alphanumeric based code that does not align with capital expenditure accounts in the MEFM's CoA. This leads to duplication of effort in data entry. There are eighteen asset category codes and three sub-codes. There is the ability to denote any asset group as "attractive", these being assets that have a high risk of being misappropriated. There is a greater focus on "attractive" items when assets audits are performed by the FO of each ministry.

1112. As a result of the structural differences between the financial system and the asset register system, reconciliations are performed regularly by the MFEM to ensure the two remain in balance with each other. Not all the information data fields are used.

1113. Each ministry's FO performs an asset audit every six months to ensure all assets are at their respective locations and in working condition. Any missing assets are investigated and the reason noted. Those that cannot be found are reported to the MFEM DG, who decides on making further enquires or writes off the item.

8.2.12 Asset Management and Job Costing

1114. A Job Costing system is the means by which information is collected for use in asset management. The MIPU's Public Works Department (PWD) has the responsibility of maintaining roads and other infrastructure throughout Vanuatu. To undertake this work the each province is voted an average of Vt90 million annually. An annual maintenance program is budgeted and established in the management financial system to account for the expenditure. Priority is given to repairs arising from storm damage when landslides occur or roads are washed away. Planned maintenance is disrupted if such events occur as no additional funds are voted.

1115. The other PWD's responsibility is to identify and estimate the cost of larger infrastructure projects and prioritise them for submission to government in the annual budget round. These projects include the sealing of roads, building of bridges of significant formation work. As the PWD's resources are limited all of these larger infrastructure projects are tendered and undertaken by the private sector contractors. On average five projects are tender annually. The total value of these five projects is Vt 50 million.

1116. When work is undertaken on large infrastructure projects substantial contractors normally prepare a program of works. This program of works breaks down the work into its main components and a detailed budget is established for each of these components against which the project is financially monitored by the contractor. Within an integrated MIS the cost of materials and labour inputs details are recorded against a job costing number and stripped out of the accounts payable, payroll and inventory via software that identifies the data by the job number assigned to each of the components in the program.

1117. Job costing (or sometimes referred to as Asset Management System) is a sub-system that enables management to assemble and aggregate information for individual projects or their sub components from within the data in the MIS. This information is scattered through the payroll, accounts payable and inventory and expenditure items. There would have to be intervention in the payroll, inventory and accounts payable to obtain project information. This is achieved by the addition of a job number recorded against each transaction. By this means it is possible to capture and provide regular information on maintenance by assets, jobs or projects as they are constructed. This is more important in commercial enterprises as component parts may have different depreciation rates or higher maintenance costs through higher wear and tear.

1118. As assets get older, maintenance costs rise with age, wear and tear. If there are numerous assets and one maintenance cost account accumulating all of the data, it is difficult to isolate the rising maintenance cost of one part of a large machine against its other parts, without significant manual effort. If early identification of the causes of rising maintenance cost can be attributed to one or two of the component parts or individual assets it can lead to significant reductions in expenditure by the early replacement of high maintenance cost assets. This is one use of asset management and job costing systems that the GoV system current lacks.

1119. The other application of a Job Costing system is to accumulate actual costs against the budget when medium to large assets are being built or constructed. This information provides managers with an early warning and monitoring of possible cost over-runs and enables remedial action to be instigated. Currently, as earlier described, each capital item may be assigned one CoA code under which all expenditure is accumulated and compared with the total budgeted funds

appropriated. If significant variations arise and the funding proves insufficient then only manual investigation and analysis will assist in pinpoint the reasons; often to late to take remedial action. Job costing reports assist to alert management to these developing issues. If a series of jobs numbers are established at the commencement of a project, breaking the construction project into its component parts with the budget funds shown for comparison then monitoring becomes routine. This needs to occur when construction projects are in the initial stages of planning and the component parts are aligned to identifiable locations and also depreciation rates. Then the asset register records can be later utilised to establish job costing maintenance programs against these identifiable part to track and identify maintenance expenditure. As the GoV MIS does not have this software or these subsystems the GoV misses out on the ability to minimize maintenance cost and control cost overruns on projects.

8.2.13 Borrowings

1120. Part 13 of the PFEM Act details the legal conditions under which the government may raise and make repayments of loans. All borrowings made by the GoV have to be sanctioned by a COM minute and full details and reasons for the loan and securities provided must be reported at the next sitting of Parliament. Every document evidencing the terms of the loan is to be signed by the Minister. A register is maintained by the MoF of all loans and repayment schedules. As far as can be determined there have been no defaults. The current budget provides for debt servicing of Vt1.99 billion or 14.2% out of a total appropriation of Vt14.01 billion.

8.3 Institutional and Governance

8.3.1 Staff Training

1121. Staff training for financial personnel is provided through:

- Monthly meetings with FOs from each ministry, and
- Regular training session for budgeting and working on the MIS.

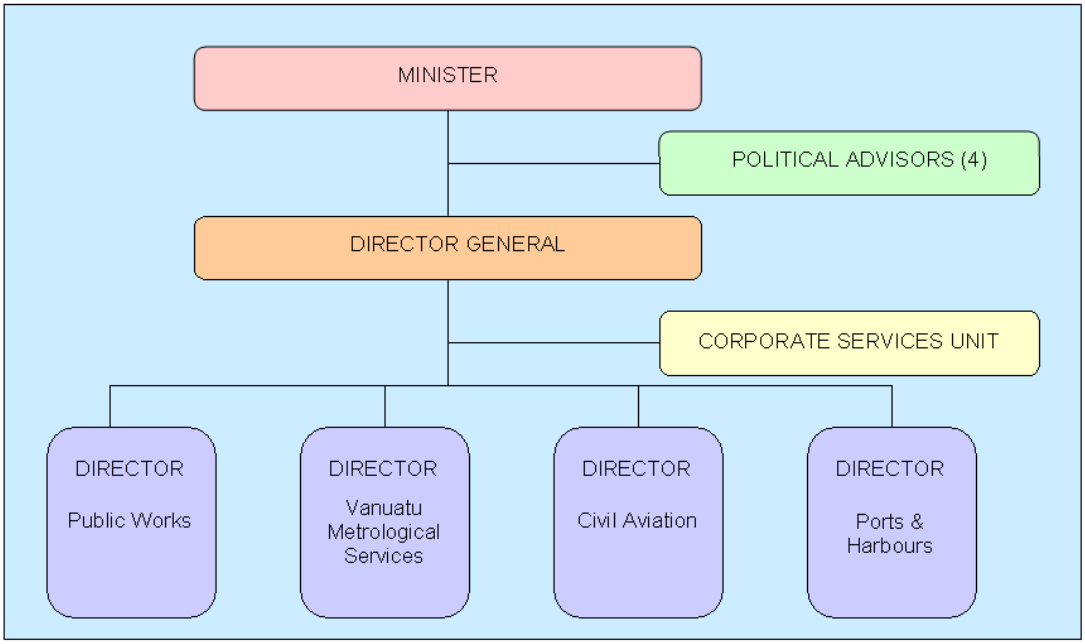
1122. The AusAID financed GfG is also providing regular training seminars focused on better budgeting.

1123. Staff within the MIPU whose duties are focused on the maintenance and recording of MIS data have attended numerous training courses in the past two years. Administrative staff have attended courses on Microsoft Word, Excel and Publisher. All FOs attend training on budget preparation every year before each budget ceiling comes out, which is predominately focused on how to input the budget figures into the Finance System. While the majority of other staff training has been focused on improving technical training skill and knowledge that is not related to financial management systems.

8.3.2 Institutional Considerations

1124. There are four operational and one administrative department within the current structure of the MIPU. The organisational structure of the MIPU is illustrated by *Figure 8.11*. All department managers reports and are accountable to the DG.

Figure 8.11: **Organizational Structure of MIPU**



8.3.3 Staff Numbers, Qualifications and Gender Mix

1125. *Table 8.12* summarizes the MIPU and presents the actual numbers of staff currently employed are listed by department and sections within each department, including descriptors on educational attainment and gender.

1126. The MIPU has an approved establishment of 286 staff, but only 222 persons are actually employed. Of the total actually employed 197 are males and 49 are females, a breakdown of 78% and 22% respectively.

1127. The education levels of staff employed are: 6.8% with a master's degree, 2.3% a bachelor's degree, 13.5% with diplomas and 77.5% with education certificates.

Table 8.12: **Staff Numbers, Education and Gender**

Department	Function	Location	Staff Numbers		Education				Gender	
			Established	Actual	Masters	Degree	Diploma	Certificats	Male	Female
	CSU									
MIPU	Administrative	Port Vila	9	5	2		2	1	4	1
PWD	H/office	Port Vila	25	23						
	Administrative					1	4	9	10	4
	- Technical				1	1	7		8	1
	Shefa	Port Vila	28	18						
	Administrative						1	1	1	1
	- Technical					1			1	
	- Workshop Unit							6		6
	- Road Unit							9		9
	Sanma									
	Administrative	Luganville	42	37			1	3	1	3
	- Technical						1	1	2	
	- Road Unit							12	12	
	- Workshop Unit							11	11	
	- Housing Unit						1	2	3	
	- Water Unit							5	5	
	Malampa									
	Administrative	Malekula	20	16			1	2	1	2
	- Road Unit							6	6	
	- Workshop Unit							5	5	
	- Housing Unit							2	2	
	Tafea									
	Administrative	Tanna	22	17				2		2
	- Technical						1		1	
	- Road Unit							6	6	
	- Workshop Unit							4	4	
	- Housing Unit							4	4	
	Penama									
	Administrative		16	11		1		3	3	1
	- Road Unit							4	4	
	- Workshop Unit							3	3	
	Torba									
	Administrative		5	4				3	2	1
	- Road Unit							1	1	
	H/office									
Ports &	Administrative		56	47	2			4	3	3
Harbours	- Technical	Port Vila						23	23	
	- Technical	Santo						18	18	
	H/office	Port Vila								
Meteorology	Administrative		54	35	1		2	3	3	3
	- Climate change unit				4		2	2	6	2
	- Forecasting Unit				3		6	11	15	5
	- IT Section				1					1
	H/office									
Civil Aviation	Administrative	Port Vila	9	9	1	1	1	6	5	4
	TOTALS		**286**	**222**	**15**	**5**	**30**	**172**	**173**	**49**
	Percentages		**100%**	**78%**	**6.8%**	**2.3%**	**13.5%**	**77.5%**	**77.9%**	**22.1%**

8.3.4 Auditing

1128. There has not been an Auditor General appointed by the GoV for many years and there has not been any visit from the Audit Office to MIPU for the last ten years. Audits are being performed for SOEs and for some government operated boards by the GOV Audit Section. A few SOEs have only returned one or two financial accounts since their establishment. Audits of government SOEs are running a year or two behind the end of their financial year.

8.3.5 International Accounting Standards

1129. The GoV has adopted the International Accounting Standard for Public Bodies and applies these in their financial reporting.

8.3.6 Reporting Requirements on Government Accounts

1130. The GoV is required by the PFEM Act, Part 6 to report the financial situation as soon as practical at the end of each financial year, but no later than the end of the third month of the next succeeding financial year.[116] The financial statements together with the compiled report must be forwarded to the Speaker of Parliament who shall table the financial statements and reports to Parliament.

1131. The reports to be tabled in Parliament are to include Statements of Accounts and any forecast of:

- total operating expenses;
- all other payments;
- total operating revenues;
- all other receipts;
- the difference between all payments and receipts;
- the level of total debt; and
- the level of net worth.

1132. It is required that the Government Accounts have to be made available for inspection as per request by any member of the public.

8.3.7 Pricing and Costing of Goods and Services

1133. In 2008 the MIPU invoiced revenues of Vt391 million per annum from goods and services provided to the public and customers, excluding contributions from donors to meteorological services. *Table 8.13* summarises revenue by department.

Table 8.13: **MIPU 2008 Revenue by Department**

MIPU Department	MIPU Invoiced Vt million	MIPU Donor Vt million	MIPU Invoiced %	MIPU Donor %
Port and Harbours	252.20	nil	79	Nil
Public Works	56.33	nil	18	Nil
Meteorological	6.73	16.24	2	100
Civil Aviation	4.26	Nil	1	Nil
Total	391.00	16.24	100	100

1134. Comparing DPH 2004 revenue to the three previous years, revenue was greater by 33% in 2005, 41% in 2006 and 61% in 2007. Interestingly enough, ship calls during the same years increased from 2004 levels by 34% in 2005, 56% in 2006 and 40% in 2007. Passenger vessels significantly decreased in 2007.

1135. The last revision for the majority of the Ports and Harbours Dues, Fees and Charges was 1992 (Order No.14), and 1993 (Order No. 4), which introduced charges for Light Dues.

[116] The GoV Financial Year end on 31 December.

1136. The majority of the DPH charges levied are based upon the overall length for each ship. Since the 1980s, changes in naval architecture have resulted in significant changes in ship design, in which vessels have a greater beam and a reduced length yet increased tonnage as compared with vessels of a few decades ago. As older ships are replaced, and unless one is acutely aware of this development, it is easy to miss one of the reasons why revenue has not risen in line with the overall tonnage of ships calling. A 1990 ADB tariff review for the PNG Harbours Board found revenue decreased over 20% from the introduction of new vessels with wider beam and a shorter length overall yet with a greater cargo carrying capacity. Resultant of the study, PNG changed to gross registered tonnes (GRT) to rectify the situation. A similar update of the DPH tariff structure would certainly assist the GoV in correcting this situation and reversing the fall in revenue.

1137. In Vanuatu, ship call charges vary from port to port and are based upon a daily rate. As the number ship calls increase whilst the number of berths available remains limited, such as will occur in Port Vila from 2011 onwards, berth utilisation and rotation will become critical. Consideration needs to be given to a charge that improves berth utilisation. Charges that achieve this objective are based on an hourly rate:

- one for load and discharge;
- another at a lower rate for maintenance along side only, if the berth is not required for load or discharge; and
- a penalty rate, higher than the load and discharge rate, commencing 30 minutes after loading or discharge has been completed.

1138. Such tariffs have been implemented in the other Pacific island ports. This type of tariff promotes efficient and effective use of berths and can have the effect of deferring the need to build another berth for a number of years, albeit the period of deferral will depend upon the growth in demand due to traffic.

1139. Another tariff the MIPU is responsible to review is the water tariff for some smaller systems in Vanuatu. The current tariff has been in force since 1991 and is Vt0.052 per cubic meter of water. As it is a flat rate tariff, persons can choose to control their use of the resource. It is suggested that this tariff should also be reviewed with the objective of ensuring sustainability of the water supply.

8.4 The Adequacy of GoV Accounting Policies and Procedures

1140. The four key government directives or financial accounting policies (FAP) and procedures that deal with its financial management systems and their control are identified in Section 0. These policies and procedures are revised from time to time as the need arises. In general, these policies and procedures are clear, unambiguous, and focused on the control and accounting for government revenue inflows and expenditure outflows, and adequate for GoV operations if followed as intended. To summarise, the relevant policy and procedure for each of the items assessed in the MIS sub-systems can be found as per the following section references:

- Planning and Budgeting – refer Section 8.2.3;
- Cash Flow Forecasting – refer Section 8.2.4;
- Delegation of Authority – refer Section 8.2.5;
- Procurement – refer Section 8.2.6;
- Payroll and Human Resources – refer Section 8.2.7;
- Accounts Receivable – refer Section 8.2.8;
- Imprests (Petty Cash) – refer Section 8.2.9;
- Fixed Assets – refer Section Item 8.2.11;
- Government Borrowing – refer Section 8.2.13; and
- Reporting – refer Section Item 8.3.6.

8.5 Capabilities and Capacity Building of MIPU

1141. The MIPU has on average fewer than 25 staff per province in the PWD to perform its role of maintaining all the government owned infrastructure such as roads, airports and wharves. Provincial authorities have additional staff, but most have little experience compared with MIPU personnel. In its other departments a similar situation applies, there is one or two very experienced personnel possibly supported by others who are less experienced. This issue has been noted in assessing the financial systems and its management thereof and in determining areas of assistance that could make worthwhile contributions to the financial operation and health of the MIPU and the GoV overall.

1142. In the assessing the financial systems some weaknesses and areas that can be improvements were identified. Some of these are currently not within the control of the MIPU as it uses the GoV's Management Information and Financial System and these are not designed with some if the issues that the MIPU face. As such, most of the points and recommendations discussed below could make significant contributions to the GoV and MIPU's future operations, if implemented with some assistance.

8.5.1 Revision of Ports and Harbours and Water Tariffs

1143. As noted in Section 8.3.7 there has been no revision of the MIPU Ports and Harbours charges for the international wharves since the 1992 to 1993 timeframe. As a result of not revising the port charges levied the GoV has incurred a significant loss of revenue estimated at more than Vt60 million per annum. The MIPU's FO has regularly submitted a rate review with each annual budget, but to date there has been nothing approved by the Minister along these lines.

1144. The basis of using LOA has been discarded in the majority ports throughout the Pacific given the changes in naval architecture as discussed earlier. Capacity building to develop new rates and have one charge covering all DPH services would bring this important revenue earning centre on par with other regional ports and provide additional funds to more properly maintain navigation aids and other maritime equipment.

1145. Additionally, some of the additional revenue could be applied to assisting any cash shortfall in constructing a critically needed inter-island shipping wharf in Port Vila, or in the early payback of a loan. There is provision within the Ports and Harbour's Act to levy a berthage charge at all wharves, but this has not been applied to wharves used by inter-island shipping.

1146. To calculate new international tariffs there is no one within the MIPU with the knowledge and understanding of the methodology to be applied to produce a modern tariff for each of the four classes of vessel. Lastly, it needs to be acknowledged that any upward revision in the international tariff, particularly to those on par with other regional charges, would be expected to coincide with increased efficiency, that is, services provided. While current GoV charges are below others in the region, the inefficiency of Ifira's services has driven up the costs of importing and exporting to a level that make this necessary adjustment impossible without impacting directly upon trade goods that Vanuatu depend upon. This relationship needs to be considered in possible tariff revision.

1147. In 2008 water charges recovered by MIPU operated water systems totalled Vt38 million, but at rates that have not been adjusted for at least ten years. A series of planned increases should be able to add another Vt9 million to government.

8.5.2 Improving Debt Collection

1148. Ports throughout the world either require the ship owners to lodge a bond or establish an irrevocable letter of credit with the port authority to cover the cost of at least two calls given the possibility of payment default. If enforcement of this policy is weak and there is the absence of penalties, shipping companies will continue to use the GoV essentially as a credit facility for as long as possible since it provides such credit free of charge and ship owners will only pay up when necessary such as the timing of their next ship call. If enforcement of such a policy was favoured it could be implemented by the MIPU or the MEFM with little effort.

1149. Under the existing procedures, the MIPU is tasked with following up non-payment of debts recorded in the Accounts Receivables, as per Section 8.2.8, where credit is given and payment is not made within the agreed time, but the MIPU has no authority to instigate enforcement or collection of outstanding monies via the court system. The decision to enforce payment via the court system or write off a debt is retained by the MEFM. There is no record of any debt, either with or without interest

penalties, being recovered by court action. Further, there are no conditions shown on contracts reviewed that could be termed a demand for payment by due date after which interest penalties apply.

1150. To further strengthen and improve debt collection, the following policies are proposed:

- penalty interest be applied after due date, or 10 days from invoice date, for non-payment of shipping charges and 30 days notice of their application be advised to all shipping companies;
- each Ministry's DG be authorised to determine if the recovery of any debt is to be pursued through court action;
- Each Ministry's Budget be amended to provide funding to initiate one or two court actions per annum; and
- alternatively the MEFM be responsible for enforcement and collection of all debts overdue by ninety days.

1151. These policies would provide the necessary authority and errant debtors, especially international ship owners, would soon change their attitude of deferring payment. At current rates of bank interest, it is estimated that the outstanding amount would earn approximately Vt15 million per annum if deposited for one year.

8.5.3 Revising Financial Regulations

1152. In comparing the current procedures with written directives it was found that some written procedures in the FR have been superseded by the introduction of new technology and are out of date. Examples found were minor variations to procedures and the introduction of new technology has strengthened the system and has further reduced existing possible risks such as from the misuse of pre-printed LPOs, as these are now generated by the MIS if an approved password is entered.

8.5.4 Improving Communications and Reporting to Remote Ministry Offices

1153. It was noted that recent work completed by AusAid called for additional financial management reports by specific activity and location.[117] The MIS is sufficiently flexible to provide information by activity and location far in excess of existing and perceived future requirements needs for each ministry. Any number of additional cost centres can be established within the structure at level 4 in the CoA. These must first be approved by the MOF. To establish another cost centre is a decision for the MIPU management. The steps to establish a new cost centre are simple. The CoA codes are determined, MFEM approval is obtained, and a transfer some of the budget is made to the new cost centre. Alternatively, these steps are completed during the budget process. MIPU management are familiar with the process and can raise additional cost centre without assistance.

1154. However, there is the issue of impediments in communications that has to be taken into account to enable managers in remote locations through the provision of access and online information. Some locations have unreliable telecommunications in addition to only having narrow bandwidth communications available. The MFEM has dedicated rental lines where possible to enable managers in some locations to operate on real time. Even these locations suffer from outages. Dedicated rental lines are expensive to operate. Occasionally when a ministry has not paid its account to the service provider, access and use is cut, thus disrupting operations.

1155. The cost of rental lines can be significantly reduced and the narrow bandwidth issue can be resolved by applying dial up protocols and not operating in real time, but with time lags of 24 hours. This technology is proven and applied in Australasia for countrywide systems during the 1980s when only narrow bandwidth was available. Since the MOF controls the establishment of all master files on the system, only some minor additional equipment is required to achieve this.

1156. The majority of the equipment may already be in place. To establish the means to operate as described above, the following is required:

- A telephone line, land or wireless for intermittent use;
- A connection between the communications system and the computer;

[117] Vanuatu Transport Sector Support Program (VTSSP) 2009.

- Software that dials up the central computer at MFEM at prearranged times and uploads and downloads data and up-dates;
- A change from real time operation on the central MIS system for remote locations to a lag time of 24 hours;
- Replication of operating software on each remote file server with all master files locked for interference or alteration;
- Ability to back up remote systems daily and safe storage of the backup tapes; and
- A minor training program in its operation.

1157. Responsibility to maintain and establish new master files, remain with the MFEM. At prearranged times daily, the MFEM central computer would call the remote file server, preferably at night. If the electricity supply was an issue, this could occur towards the close of the business day. Without describing all the technicalities, both computers swap information of the day's transactions and the central computer provides any new system updates. Leased lines can then be dispensed with as the file server is connected only when required. To ensure that malfeasance is minimized, the following policy should always be enforced: if no information swap has taken place for two or three business days, then urgent remedial action should follow. This action should take the form of a surprise visit by a senior officer that checks why the system is down and takes backup copies of the data.

1158. These improvements, changes and cost savings could be realized if MIPU and the GoV was provided with some assistance from a specialist knowledgeable in the specified software and procedures.

8.5.5 Amending Petty Cash Procedures

1159. With the vagaries of mail deliveries that currently exist in Vanuatu it is unlikely delivery times could be improved. This issue could be resolved by issuing a directive that requires the receipts for cash floats to be accounted for when 25% of the cash float remains or some other agreed level. To ensure cash floats at remote locations do not become totally depleted, causing disrupts to operations, the cash float could be increased and higher level established when the returns has been made. This would ensure there is sufficient money remaining to continue operations until the float was replenished. This can be implemented by the MIPU and the MEFM.

8.5.6 Updating and Amending the Chart of Accounts

1160. The GoV Financial systems use alphanumeric account codes and this significantly slows the time of data entry. Estimates of the increased input time varies, but physiological tests show it can be as high as for to six times longer than using just numeric codes. Most PC keyboards are designed with this issue in mind. The numeric keys are grouped together on the right side of the keyboard. The data entry operator does not then have to move their hand back and forth when using numeric codes. The alphas are spread across the keyboard and data entry operators have to use both hands for data entry. To change this in the current system is a large undertaking. As the quantity of data entry into the GoV MIS is relatively low, the costs of making the change outweigh the benefits. The issue should be noted and a change made if the system is later upgraded.

8.5.7 Inventory Control and Job Costing

1161. The poor inventory management is noted in Section 8.2.10 as is the lack of a job costing system to assist in identification of poor performing fixed assets and measuring the construction of infrastructure (Section 8.2.12). Currently, there is no GoV policy or procedure for these issues. Implementation of an inventory system would be required to capture data on materials issued for projects or jobs before a job costing system could be implemented. To establish a job costing system would require intervention in existing MEFM financial systems that are currently working well and may cause disruptions to the normal flow of recording transactions.

1162. While it is highly desirable to achieve better control of existing inventories and infrastructure jobs there are the following counter issues to take into consideration. Software costs for inventory and job costing systems are estimated at US$ 60,000. Using a basic IT measure training and installation cost would increase this estimate by up to six times before it is fully operational. It is highly probable that the existing MEFM system software either has no sub systems (inventory or job costing)

that could be purchased or would be technically incompatible with purpose built inventory or job costing software. Backup software skills are not available in Vanuatu to resolve software technical or operating issues.

1163. With the MIPU using contractors to perform the larger infrastructure work (five tendered infrastructure projects totalling Vt 60million per annum) and minor road maintenance undertaken by the MIPU, the expenditure of which consists mainly of wages and salaries, the benefits resulting from such a complex system is insufficient to justify the large implementation costs in the near future.

1164. The MIPU could benefit from a job costing and asset management system but their current volume and value does not warrant its implementation at this time for the reasons discussed. When infrastructure projects exceed a set value, expenditure control can be attained by the establishment of a cost centre as described earlier. Assistance in establishing inventories systems as a first step could provide benefits for both MIPU and other ministries i.e. Ministry of Health, but these benefits for the GoV overall have not been determined.

1165. Until the GoV contemplate an upgrade or replacement of its current software, implementation of a job costing systems should be excluded as part of this consideration. As a consequence of this finding the proposed flow of funds, monitoring and control for the South Paray Bay and any other wharf infrastructure should be overseen by the "Engineer" tasked with managing the contract and accounting for all investment expenditure during the construction.

8.5.8 Strengthening GoV Internal Audit

1166. As highlighted in Section 8.3.4 the MIPU and other government ministries have not had the benefit of an independent internal audit for the last ten years to confirm that the systems are operating as designed and are recording the information accurately and consistently. An audit would possibility identify transactions where entries were made in error either through a lack of understanding or by deliberate intent. It would also confirm if procedures at any ministry were being applied as directed and not in ways unintended. Where changes to procedures for the better or those resultant from the application of new technology are required but where amendments had yet to be made to the FR these could be noted, and then the FR could be updated to ensure such changes became uniform practices and having had an official sanction to such practices formally recorded.

1167. The Auditor General has a small complement of staff focused on State Owned Enterprises (SOE) audits and not upon government ministries. As the perceived risks are possibly higher in the SOEs, it is appropriate that the few resources available are applied in this area. However, some skills and resources should be allocated to ensuring the main streams of government revenue and expenditure are also safeguarded.

1168. However, it needs to be emphasized that the internal audit of government financial systems requires a different approach and skill set from the SOE audits and since no audits have been performed for at least ten years, these skills sets have largely been lost. For these reasons, some assistance to reinvigorate these skills for this vital function are warranted.

8.6 Mitigation of the Risks

1169. There are five risks that can be mitigated, two of which benefit all government ministries and two that are specifically relevant to the MIPU. These are:

- performing an internal audit of government ministries;
- Flow/control of proposed new infrastructure investment funds and disbursements;
- improving MIS communications;
- install a inventory software system; and
- improving sub-optimal revenue collection.

8.6.1 Reinvigorating the Internal Audit

1170. As there has been no independent audit of the MIPU or other ministerial financial accounts in the last ten years, assistance to reinvigorate the internal audit of GoV financial systems would for the reasons discussed above be prudent to mitigate any possible risks in revenue collection and expenditure associated with loans projects that may be forthcoming in the future. The proposed

capacity building assistance would take the form of rebuilding and training a few of the Auditor General's personnel to program and perform audits of ministry systems and financial accounts. It is proposed that an internal auditing specialist be engaged for a period of twelve months to assist in building capacity in this section.

8.6.2 Flow / Control of Proposed New Infrastructure Funds and Disbursements

1171. The MIPU does not have the capacity and information systems suitable to properly manage the construction of larger infrastructure projects and the proposed wharfs and jetty infrastructure. As discussed in the issues of inventory and job costing the time lapse to identify, install and train GoV staff would, if the MEFM accepted the need, take at least twelve months or longer depending on the availability of compatible software. It would take longer if the GoV system required upgrading or replacement. The fall back position when facing such circumstances is to appoint a specialist tasked with the management and accounting of all funds dispersed.

1172. The specialist to mitigate the risks associated with construction projects is referred to as the "Engineer", in the FIDIC terminology, who is appointed as part of the infrastructure project. The "Engineer's" tasks include among others: overseeing and ensuring the quality of work and installation according to designs, control/certifying payment for each stage, maintaining accurate records, and providing capacity building training for selected PWD engineering personnel. A cost centre should be established for each individual infrastructure project and the current Accounts Payable System would be used. The estimated construction phase for the proposed Port Vila domestic wharf and the jetties in the Outer Islands is 12 to 24 months after all designs have been completed and approvals given.

8.6.3 Strengthening Government Debt Collection

1173. The collection of debts is well within current capabilities of existing ministries. The majority of the outstanding debt is related to international shipping charges. What is lacking is: a clear policy, the introduction of penalties and their enforcement. The MEFM may welcome assistance but this has not been tested.

8.6.4 Improving Inventory Control

1174. The MIPU does not carry significant inventories of any value. It makes its purchases on an on required basis for the smaller repair jobs that it undertakes. This is accounted for through the accounts payable system and charged directly against a cost centre established for each PWD centre or in some cases against a particular project identified in the annual budget. As a first step the MIPU's PWD would be marginally better informed if there was a better inventory control and job costing system but other ministries like the Ministry of Health would benefit substantially from better control of expensive medicines and identification of use by dates etc.

1175. The second step of installing a job costing system would provide the most benefit to the PWD. However, the issues to resolve have already been highlighted and with the PWD contracting all larger projects out to qualified private sector companies it is highly unlikely that the expenditure and effort required could be justified.

1176. It is not known exactly how many ministries carry a large enough volume and value of inventories to assess the time requirements or the availability of software that is compatible with the GoV current system. If this did proceed it could take up to six months to ensure all inventory items were recorded, staff trained in its use and initial stocktaking completed to verify the accuracy of all items.

8.6.5 Revision of Port and Water Tariffs

1177. A well overdue revision of international and domestic port tariffs, water, and other tariffs is critical in the management of Vanuatu's most important infrastructure, both in Port Vila and in the Outer Islands. It is estimated that a specialist on port tariffs and capacity building could complete these tasks in one month and pass on the methodology to the MIPU (DPH). All of the necessary records and information are held in the MIPU in Port Vila. It is assessed that the GoV is missing out on additional revenue (related to international port charges under the MIPU control) amounting to Vt15 million per annum. Given the pricing and port tariffs issues discussed earlier a revision could only commence after Ifira's operational efficiency and level of charges have been addressed.

1178. The total of water charges collected by the MIPU in 2008 was Vt38 million. A tariff review introduced over a few years could increase this revenue by Vt9 million. A specialist on water tariffs would not take more than one month to complete the task. Provision for water tariff specialist has been provided in the financial assessments.

8.6.6 Improving Ministerial Communications and Reporting

1179. Improvement of communications and the dissemination of reports to managers in the remote offices requires a software specialist to implement the software program "PC Anywhere" or a similar program, and the training of MIPU and other government ministries in the use of the system as per the communication and system protocols to operate the GoV MIS on a timeline as discussed earlier. The MIPU annually spends Vt5 million on telephone and fax communications but it is not known how much of this expenditure is related to hired telephone lines for real time MIS communications. When all government ministries expenditure made on leased lines is known the amount could result in a substantial cost saving if this suggested the software program "PC Anywhere" or a similar program was implemented. It is estimated, after allowing for unforeseen issues arising, that it would take three months to implement.

8.7 Financial Evaluation – Infrastructure

1180. Financial evaluation has been completed for infrastructure at following locations:

- Construction of an inter-island wharf in Port Vila;
- Rehabilitation and repairs of Simonson wharf at Luganville;
- Rehabilitation and repairs of Litz Litz wharf at Malakula;
- Rehabilitation and repairs of Lenakel wharf at Tanna;
- A new Slipway; and
- Other subprojects.

1181. The engineering examination of Marine Quay revealed that it should be demolished. The estimated cost to demolish it is Vt9.8 million. No investment evaluation was completed.

1182. A financial analysis, but of a restricted nature, for the other proposed new infrastructure or rehabilitation of outer island wharves or jetties was completed but under current arrangements there is no standard framework across Vanuatu whereby these facilities generate income to be collected and transferred to the national government.

1183. Where income or revenue is currently collected by the MIPU or private wharf operators; all revenue in the financial evaluations has been based upon these existing charges or tariffs. For the proposed new South Paray Bay Wharf in Port Vila sensitivity analysis shows the impact of price increases (see *Table 8.17*).

8.7.1 Financial Assumptions

1184. The following assumptions have been made and incorporated into the financial evaluations:

- The funding of all of the proposed new infrastructure projects and those to be repaired will be by way of a concessional loan with a term of 32 years. The interest rates of 1.0% for the grace period of 8 year and 1.50% post grace.
- The government will acquire the land required or already owns it. The impact of this on the weighted average cost of capital is small and the overall discount rate applied after allowing for this minor adjustment is 1.30%.
- The growth in number of ship calls is expected to be 2.5%, equivalent to the estimated rural population growth in Vanuatu.
- For the proposed new wharf infrastructure in Port Vila a uniform per hour berthage rate charge (based upon existing rates and charges) for vessels alongside while loading or discharging has been assumed (refer to Section 8.5.1) and collected daily. The current charge average overall has been applied to calculate the financial returns.

- Electricity and water services provided to ships alongside are priced at cost plus 20%.
- Accounts Receivables equivalent to one week's revenue and Accounts Payables of one month have been assumed.

8.7.2 Financial Analysis Port Vila, South Paray Wharf

1185. The estimates capital cost of building a domestic wharf at South Paray Bay is US$8.12 million. The financial analysis is based upon a loan of 32 years, with a grace period of 8 years at 1% interest and capitalised. The post grace interest rate of 1.5% per annum has been applied to the remaining 24 years; repaid in arrears every six months.

1186. The capital cost cash outflows of the construction including the acquisition of land are estimated to be US$4.38 million in the first year and US$3.74 in the second year.

1187. The loan principal to be repaid after adding interest capitalised US$629,279 amounts to US$8.619 million repayable in fixed instalments of VT 62 9 million (US$ 0.63) every six months, in arrears from year nine onwards.

1188. The engineering design provides for three berths and two ramps. It is estimated that the berth capacity at this facility will be fully utilised by 2030 and thereafter may have to be extended to cater for the estimated growth in demand. The cost of the expansion of the facility has not been included and projected revenue forward from 2030 has been capped for the remaining period of the loan and financial evaluation.

Table 8.14: **Projected Income and Expenditure of Proposed South Paray Wharf**

Year	2010 Current	2011 Current	2012 Forecast	2013 Forecast	2014 Forecast	2015 Forecast	2020 Forecast	2025 Forecast	2030 Forecast	2035 Forecast	2040 Forecast
Facility Statistics											
Number of Berths											
- General			3	3	3	3	3	3	3	3	3
- Bow Ramp			2	2	2	2	2	2	2	2	2
Capacity											
- General			1,095	1,095	1,095	1,095	1,095	1,095	1,095	1,095	1,095
- Bow Ramp			730	730	730	730	730	730	730	730	730
Berth Days - Demand											
- General Berth	556	570	584	599	614	629	712	805	911	1,031	1,095
- Bow Ramp	195	200	205	210	215	221	250	282	320	362	409
Ship Call Days											
- General Berth	484	496	509	521	534	548	620	701	793	897	1,015
- Bow Ramp	170	174	179	183	188	192	218	246	279	315	357
Berth Occupancy											
- General Berth			53%	55%	56%	57%	65%	74%	83%	94%	100%
- Bow Ramp			28%	29%	29%	30%	34%	39%	44%	50%	56%
Average Per Berth Call Rate											
- General Berth	27,868	27,868	27,868	27,868	27,868	27,868	27,868	27,868	27,868	27,868	27,868
- Bow Ramp	32,162	32,162	32,162	32,162	32,162	32,162	32,162	32,162	32,162	32,162	32,162

VT (000)s	VT (000)s	VT (000)s	VT (000)s	VT (000)s	VT (000)s	VT (000)s	VT (000)s	VT (000)s	VT (000)s	VT (000)s	VT (000)s
Operating Revenue											
Vessel Calls (berthage etc)			19,915	20,413	20,923	21,447	24,265	27,453	31,061	35,143	39,761
Recovery - Electricity			720	738	756	775	877	992	1,122	1,270	1,372
Recovery - Water			686	704	721	739	836	946	1,071	1,211	1,308
VAT (10%)			2,132	2,185	2,240	2,296	2,598	2,939	3,325	3,762	4,244
Total Revenue	-	-	**23,453**	**24,040**	**24,641**	**25,257**	**28,576**	**32,331**	**36,579**	**41,386**	**46,685**
Operating Expenses											
Wages and Salaries			492	492	492	492	492	492	492	492	492
Supplies and consumables			50	50	50	50	50	50	50	50	50
Electricity			600	615	630	646	731	827	935	1,058	1,143
Water			572	586	601	616	697	789	892	1,009	1,090
Repairs and Maintenance			6,475	6,475	6,475	6,475	6,475	6,475	6,475	6,475	6,475
Depreciation as per schedule	-	-	16,699	16,699	16,699	16,699	16,699	16,699	16,699	16,699	-
Total Operating Expenses	-	-	**24,888**	**24,918**	**24,948**	**24,978**	**25,144**	**25,332**	**25,544**	**25,784**	**9,250**
Surplus (deficit)	-	-	**(1,435)**	**(878)**	**(307)**	**278**	**3,432**	**6,999**	**11,035**	**15,602**	**37,434**
Project Related interest costs							11,904	9,500	6,908	4,116	1,107
Other interest - bank				(1,031)	(2,203)	(3,438)	(5,091)				
Gains (losses) on sale of fixed Assets											
Total Non-operating revenue (expenses)	-	-	-	**(1,031)**	**(2,203)**	**(3,438)**	**6,814**	**9,500**	**6,908**	**4,116**	**1,107**
Surplus (deficit) Ordinary Activities B/f extraordinary Items		-	**(1,435)**	**153**	**1,896**	**3,717**	**(3,382)**	**(2,500)**	**4,127**	**11,486**	**36,327**
Extraordinary Items											
Taxation VAT	-	-	2,132	2,185	2,240	2,296	2,598	2,939	3,325	3,762	4,244
Net Surplus (Deficit) for the Year after Tax	-	-	**(3,567)**	**(2,032)**	**(344)**	**1,421**	**(5,980)**	**(5,440)**	**802**	**7,724**	**32,083**

1189. *Table 8.14* identifies the revenue and expenditure for each year until 2020 and thereafter at five yearly intervals. The charge for ships using the general three conventional berths averages Vt27,868 whereas the charge for ships using the two ramps averages Vt32,162. The revenue

generated by this facility is estimated at Vt21,321 million in the first year of operation, exclusive of 10% GST, rising to Vt34,315, exclusive of 10% GST, in 2037 when additional berths will be required.

1190. The costs of operation include DPH staff, maintenance averaging 1% and depreciation averaging 2% of the capital construction cost. The average VAT generated by the facility is Vt2.845 million per annum.

1191. The South Paray Wharf Balance Sheet, *Table 8.15* shows an increasing working capital. This resulting from increasing cash flow deficits during the loan repayment period.

Table 8.15: **South Paray Wharf Balance Sheet 2010 to 2040**

Balance Sheet	**Year**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**
At at 31 December		**Actual**	**Actual**	**Actual**	**Forecast**	**Forecast**	**Forecast**	**Forecast**	**Forecast**	**Forecast**	**Forecast**	**Forecast**
		Vt (000)s	**Vt (000)s**	**Vt (000)s**	**Vt (000)s**	**Vt (000)s**	**Vt (000)s**	**Vt (000)s**	**Vt (000)s**	**Vt (000)s**	**Vt (000)s**	**Vt (000)s**
Current Assets												
Cash in Bank				12,885	27,533	42,979	61,056	42,372	(72,376)	(176,068)	(259,653)	(320,559)
Accounts Receivables		-	-	888	911	933	957	1,082	1,225	1,386	1,568	1,768
Total Current Assets		**-**	**-**	**13,774**	**28,443**	**43,912**	**62,013**	**43,455**	**(71,152)**	**(174,682)**	**(258,085)**	**(318,790)**
Less												
Current Liabilities												
Accounts Payable		-	-	641	644	646	649	663	678	696	716	730
Employee Benefits												
Total Current Liabilities		**-**	**-**	**641**	**644**	**646**	**649**	**663**	**678**	**696**	**716**	**730**
Working Capital		**-**	**-**	**13,132**	**27,799**	**43,266**	**61,364**	**42,792**	**(71,830)**	**(175,378)**	**(258,801)**	**(319,520)**
Plus *Non-current Assets*												
Investments (non current portio)												
Fixed Assets												
- land (cost)		-	-	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000
- Wharves (net BV)		-	-	751,127	735,715	720,304	704,892	627,833	550,774	473,715	396,656	319,598
- Buildings (Net BV)		-	-	16,282	15,949	15,617	15,285	13,623	11,962	10,301	8,639	6,978
- Plant & Equipment Net BV)		-	-	30,888	29,933	28,978	28,022	23,246	18,469	13,693	8,916	4,140
- Other (Net BV)		-	-	-	-	-	-	-	-	-	-	-
Intangible assets												
Total Non Current Assets		**-**	**-**	**801,297**	**784,598**	**767,898**	**751,199**	**667,702**	**584,205**	**500,709**	**417,212**	**333,715**
Less *Non-current Liabilities*												
Borrowings		435,431	811,996	828,317	836,601	844,967	853,416	770,337	608,219	433,524	245,275	42,422
Total Non Current Liabilities		435,431	811,996	828,317	836,601	844,967	853,416	770,337	608,219	433,524	245,275	42,422
NET ASSETS		(435,431)	(811,996)	(13,888)	(24,204)	(33,802)	(40,854)	(59,843)	(95,844)	(108,194)	(86,865)	(28,227)
Equity												
Issued and Paid-up Capital												
Reserves												
Accumulated Surpluses (deficits)		(435,431)	(811,996)	(13,888)	(24,204)	(33,802)	(40,854)	(59,843)	(95,844)	(108,194)	(86,865)	(28,227)
Total Equity		**(435,431)**	**(811,996)**	**(13,888)**	**(24,204)**	**(33,802)**	**(40,854)**	**(59,843)**	**(95,844)**	**(108,194)**	**(86,865)**	**(28,227)**

1192. As shown in *Table 8.16* and after applying the existing charges for berthage the Financial Internal Rate of Return (FIRR) is negative and the Financial Net Present Value (NPV) is a negative Vt1,024 million (US$ 10.2 million). Initially the cash flows are positive due to the 8 year period of grace when the interest is capitalised. From 2018 the cash flow is negative as the interest on the loan is charged against revenue in the operating accounts.

Table 8.16: **South Paray Wharf Cash Flow 2010 to 2040**

Forecast Cash Flow Statement	**Year**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**
For the years ended 31 December		**Actual**	**Actual**	**Forecast**	**Forecast**	**Forecast**	**Forecast**	**Forecast**	**Forecast**	**Forecast**	**Forecast**	**Forecast**
Inflows		**Vt (000)s**	**Vt (000)s**	**Vt (000)s**	**Vt (000)s**	**Vt (000)s**	**Vt (000)s**	**Vt (000)s**	**Vt (000)s**	**Vt (000)s**	**Vt (000)s**	**Vt (000)s**
Net surplus (deficit)		**-**	-	(3,567)	(2,032)	(344)	1,421	(5,980)	(5,440)	802	7,724	32,083
Depreciation		**-**	-	16,699	16,699	16,699	16,699	16,699	16,699	16,699	16,699	-
Accounts Payable		**-**	-	641	2	3	3	3	3	4	4	1
Proceeds from New Borrowings				16,321	8,283	8,366	8,450					
Total Inflows		**-**	**-**	**13,774**	**14,669**	**16,358**	**18,123**	**10,722**	**11,263**	**17,505**	**24,427**	**32,084**
Outflows												
Accounts Receivable		-	-	888	22	911	46	987	181	1,140	355	1,333
Construction		435,431	376,565									
Repayment of borrowings								30,995	33,400	35,991	38,783	40,562
Dividends paid												
Total Outflows		**435,431**	**376,565**	**888**	**22**	**911**	**46**	**31,982**	**33,581**	**37,131**	**39,138**	**41,895**
Net Cash Flows		**(435,431)**	**(376,565)**	**12,885**	**14,647**	**15,446**	**18,077**	**(21,259)**	**(22,318)**	**(19,626)**	**(14,711)**	**(9,811)**

Internal Rate of Return		**#DIV/0!**
Net Present Value @ discount rate of	1.3%	**(1,021,173)**

1193. *Table 8.17* indicates the sensitivity to the two variables, the price charged for services and the loan interest rate, which may be adjusted to improve the NPV or FIRR. Possible concession interest

rates has been applied in each of the two examples and the result of an increasing tariffs for services in steps of 10% show the impact on the NPV and FIRR.

Table 8.17: **Financial Sensitivity of the Port Vila South Paray Wharf Proposal**

	Loan Interest Rate	Revenue Change	NPV	FIRR	Loan Interest Rate	Revenue Change	NPV	FIRR
	%	%	Vt 000s		%	%	Vt 000s	
Base	1.0%	0%	(982,589)		1.5%	0%	(1,021,173)	
Case 1	1.0%	10%	(913,026)		1.5%	10%	(954,592)	
Case 2	1.0%	20%	(843,483)		1.5%	20%	(855,049)	
Case 3	1.0%	30%	(773,941)		1.5%	30%	(815,506)	
Case 4	1.0%	40%	(704,398)		1.5%	40%	(745,963)	
Case 5	1.0%	50%	(634,855)		1.5%	50%	(676,421)	
Case 6	1.0%	60%	(565,312)	-8.29%	1.5%	60%	(606,878)	
Case 7	1.0%	70%	(495,769)	-6.19%	1.5%	70%	(537,335)	-7.56%
Case 8	1.0%	80%	(426,227)	-4.59%	1.5%	80%	(467,792)	-5.63%
Case 9	1.0%	90%	(356,684)	-3.30%	1.5%	90%	(398,249)	-4.13%
Case 10	1.0%	100%	(287,141)	-2.19%	1.5%	100%	(328,706)	-2.89%

Note: First interest rate 1% for 32 years; second interest rate 1% for 8 years then 1.50%

1194. Reducing the loan interest including the period of grace and post grace to 1.00% and increasing the price or tariff charged, marginally improves the two key financial measures but the FIRR and the NPV remain negative. Both sensitivity tests show that a tariff increase in excess of 100% would be required to achieve a positive FIRR and NPV.

1195. The financial analysis does not include adjustments to tariffs or charges; but these could be introduced in to improve the GoV fiscal position in the future as the majority of the South Paray project operating costs are fixed. However, these would impact on passenger and cargo costs between Port Vila and the outer islands. In Phase I of this project it was concluded (and agreed) that the cost of travel by ship was still affordable being under the 4% of household expenditure (in all provinces) considered as the standard affordability measure.

8.7.3 Financial Analysis: Other Subprojects

1196. *Table 8.18* summarises the financial results of all infrastructure sub projects including the Port Vila wharf.

Table 8.18: **Summary of Financial Evaluation of Infrastructure Projects**

Project Location		Wharf Port Vila	Rural Wharf Loltong	3 Jetties Outer Is	Slipway General	Simonson Luganville	LitzLitz Malekula	Lenakel Tanna
Capital Est Cost	Vt 000s	811,996	266,716	598,207	152,067	384,008	73,118	96,182
	US$million	8.15	1.93	3.77	1.52	3.84	0.73	0.96
Financial Support		Loan	Loan	Loan	Loan	Loan	Loan	Loan
Loan Term - years		32	32	32	32	32	32	32
Grace Period - years		8	8	8	8	8	8	8
Interest Rate - Grace Period		1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Interest Rate - Balance		1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%
Weighted Cost of Capital		1.3%	1.3%	1.3%	1.3%	1.3%	1.3%	1.3%
Financial Results								
- NPV	Vt 000s	(1,021)	(527)	(1,206)	(122)	(715)	(94)	(184)
- FIRR		negative	negative	negative	negative	negative	negative	negative
		Vt 000s	**Vt 000s**	**Vt 000s**	**Vt 000s**	**Vt 000s**	**Vt 000s**	**Vt 000s**
Average Operating Cash Flow		(10,094)	(8,982)	(20,860)	(847)	(15,565)	(3,625)	(4,091)
Loan Repayments Per Annum (after grace period)		42,899	14,374	32,240	5,856	19,303	3,941	5,132

1197. Revenue was estimated for all subprojects. But this was minimal and investigation showed that the provincial government or its licensed operator collected all revenue and that the central government *would not* receive any revenue (to finance repairs or upgrades or other). So no revenue could be reasonably included. Where new infrastructure was proposed and charges introduced most

ship operators would continue to use a nearby beach to avoid the charges. There remained a very large gap between existing revenue required to support the project.

1198. In most circumstances it was found that provincial governments had sub-contracted out the wharf or jetty operation and maintenance in return for a small share of the surplus (if any). Furthermore little or no expenditure was made on maintenance.

8.7.4 Financial Analysis: Loltong Wharf Construction

1199. The capital costs to construct the wharf at Loltong have been estimated at Vt 266.7 million, which includes a share of mobilisation costs, and it has been assumed that this work be funded by a loan identical to that proposed for the Port Vila South Paray Wharf.

1200. There is no identifiable revenue and so it has been assumed the GoV would not receive any revenue to support repayments of a loan. The financial results therefore show a negative financial internal rate of return (FIRR) and a negative financial net present value (NPV) of Vt 0.527 million. The net operating deficit is estimated at negative Vt 9.0 million and loan repayments Vt 14.4 million per annum.

8.7.5 Financial Analysis: Rural Outer Island Jetties

1201. A major component in estimating the costs of constructing jetties in three the outer islands is the preparation and mobilisation of equipment to each of the locations. This significant cost has been allocated over each of the four sites (including the rural wharf at Loltong). The funding and assumptions to construct these facilities are for all other infrastructure subprojects.

1202. If a berthage charge was introduced at any of the Outer Island sites it is highly probable that ships would not use the jetty and continue with their present (less efficient) practices rather than incur additional financial cost to use the proposed facility. It has therefore been assumed that no revenue would be collected at the Outer Island jetties.

~~1199.~~1203. The capital cost of constructing these three subprojects has been estimated at Vt 598.2 million and has a negative FIRR and a negative NPV of Vt 1.206 million. If constructed and operated without any form of revenue the average annual operating deficit is estimated at negative Vt 20.9 million and annual loan repayments Vt32.2 million.

8.7.6 Financial Analysis: Marine Quay and Slipway

~~1200.~~1204. It has been recommended that Marine Quay Wharf be demolished at an estimated cost of approximately Vt9 million; as a consequence no financial analysis has been performed.

~~1201.~~1205. The construction of the proposed slipway is estimated at Vt152.1 million or US$1.5 million. The FIRR and NPV at current and projected usage resulted in a negative FIRR and a NPV of Vt 0.122 million. The annual average net cash flow was assessed at negative Vt 847,000 and the annual loan repayments at Vt 5.9 million.

8.7.7 Financial Analysis: Simonsen's Wharf Upgrade and Repairs

~~1202.~~1206. The costs of repairs and rehabilitation to the Simonsen's Wharf at Luganville have been estimated at Vt384.0 million or US$3.84 million and funded similarly to other infrastructure subprojects.

~~1203.~~1207. The average annual operating cash flow is estimated to be negative Vt 15.6 million. Simonsen's Wharf generates some revenue and a very small annual surplus used by the provincial government. If charges at this wharf where increased operators would use other Luganville wharves in preference. The GoV would therefore probably not receive additional revenue to support a loan taken to repair the facilities. The annual repayment of loan principle and interest would be VT19.3 million per annum.

~~1204.~~1208. The financial analysis results in a negative NPV of Vt714.8 million or US$7.15 million.

8.7.8 Financial Analysis: Litz Litz Wharf Upgrade and Repairs

1209. The costs of repairs to the wharf at Litz Litz have been estimated at Vt 73.1 million and will be funded as for all other subprojects.

1210. It has been assumed the government would not receive any revenue to support loan repayments. The annual costs of operation are estimated to be Vt 3.6 million.

~~1205.~~1211. The cash flows result in a negative FIRR and negative FNPV of Vt 94,000. There would be loan annual repayments Vt 4.0 million.

8.7.9 Financial Analysis: Lenakel Wharf Upgrade and Repairs

1212. The costs of repairs and rehabilitation to the wharf at Lenakel have been estimated at Vt 96.2 million funded as for other subprojects.

~~1206.~~1213. Lenakel is unique as some revenue is generated at this facility, The provincial government has contracted out the management of the facility to Lenakel Wharf and Stevedoring Ltd, a local landowners' company. Most of the revenue is generated from charges levied on goods, whereas very little is derived from ship charges. Under the current arrangement the GoV would receive no revenue to support repayments of a loan. The financial results therefore show a negative FIRR and a negative NPV of Vt 184 million. The net operating deficit is estimated at Vt 4.1 million and loan repayments Vt 5.1 million per annum.

8.8 Financing Plan: Infrastructure and Supporting Initiatives

~~1207.~~1214. *Table 8.19* details cost estimates for the proposed capacity building initiatives over the first two years along with an indication of the person months required during those first two years. The safety regulatory adviser, however, is required for a five year period, which extends beyond the first two year that are reflected in the table.

Table 8.19: **Capacity Building Cost Estimates**

	Internal Audit	Tariff Update	Comms & Reporting	Environment MIPU	Coordinator Shipping	Law Technical	MIPU Safety Reg	Inventory Assist	Totals	Ist Yr	2nd Yr
Report Reference	**9.3.8**	**9.3.1**	**9.3.4**	**Appendix**	**1.2.10**	**7.1**					
Man months	**6**	**2**	**3**	**12**	**2**	**12**	**24**	**6**	**67**	**29**	**38**
	Vt 000s	**Vt 000s**	**Vt 000s**	**Vt 000s**	**Vt 000s**	**Vt 000s**	**Vt 000s**	**Vt000s**	**Vt 000s**	**Vt 000s**	**Vt 000s**
Fees	9,000	3,000	4,500	18,000	3,350	24,000	30,000	9,000	100,850	61,985	38,865
Per Diem	3,420	1,140	1,710	6,840	1,518	7,740	7,200	3,420	32,988	18,993	13,995
International Airfares	200	100	100	300	100	480		200	1,480	875	605
Equipment/software			400	5,500				1,400	7,300	535	6,765
Sub Total Foreign	**12,620**	**4,240**	**6,710**	**30,640**	**4,968**	**32,220**	**37,200**	**14,020**	**142,618**	**82,388**	**60,230**
Airfares Local/Travel	-	-	135	2,900	46	-			3,081	1,585	1,496
Communications	30	10	15			60		30	145	55	90
Local Staff Specialists				9,800					9,800	4,900	4,900
Training				10,000				5,000	15,000	5,000	5,000
Reports	45	15	23	90	15	90		90	368	83	285
Office, Power etc	120	40	60	240	40	360		120	980	700	280
Sub Total Local	**195**	**65**	**233**	**23,030**	**101**	**510**		**5,240**	**29,374**	**12,323**	**17,051**
Contingencies 7%	897	301	486	3,757	355	2,291		1,348	9,435	6,630	5,410
Total	**13,712**	**4,606**	**7,428**	**57,427**	**5,424**	**35,021**	**37,200**	**20,608**	**181,427**	**101,340**	**80,087**

~~1208.~~1215. *Table 8.20* consolidates the funding requirements for infrastructure, institutional capacity building, and the shipping support schemes to provide an overview of the funding requirements for the first five years and the possible year of commitment. Table 8.20 also identifies the possible sources of finance for each of the proposed projects by loan, donor technical assistance and those to be funded by the GoV.

~~1209.~~1216. As advised all proposed individual infrastructure projects would be financed by loans for a period of 32 years at interest rates of one percent for the first eight years (with interest capitalised during this period of grace) and then at a rate of 1.5% for the remaining 24 years . The Shipping Coordinator Scheme to be supported by donor technical assistance for up to five years. It has been assumed that other institutional and capacity building initiatives listed in table 8.20 would be similarly funded by donor grants. The remaining two subprojects or project components, the Shipping Services Support Scheme and additional staff resulting from the MIPU organizational restructuring would be funded by the GoV.

Table 8.20: **Overview of Funding Requirements**

	Loans Draw Down		Donor Technical Assistance					GoV					Report Reference
Year	2010	2011	2010	2011	2012	2013	2014	2010	2011	2012	2013	2014	
Units: 000's	Vt	Vt	Vt	Vt	Vt	Vt	Vt	Vt	Vt	Vt	Vt	Vt	
New Infrastructure													
Port Vila - South Paray Wharf	438,431	373,565											8.7.2
Loltong	266,716												8.7.9
Other Outer Islands (3)	598,207												8.7.6
Total New Infrastructure	1,303,354	373,565											
Rehabilitation and Repairs													
Litzlitz	73,118												8.7.7
Simonsen	384,008												8.7.4
Lenakal	96,182												8.7.8
Slipway	152,068												8.7.5
Total Rehabilitation & Repairs	705,375												
Shipping Support													
Shipping Services Support								4,400	4,400				8.9 & 8.10
Shipping Coordinator			7,273	7,273	7,273	7,273	7,273						Chapter 1
Total Shipping Support			7,273	7,273	7,273	7,273	7,273	4,400	4,400				
Capacity Building													
MIPU Organisational Restructuring								10,000	10,000	10,000	10,000	10,000	
Internal Audit			13,712										8.6.1
Inventory				11,008	9,600								8.6.4
Tariff Update			4,606										8.5.1
Communication & Reporting			7,428										8.5.4
MIPU Environment Unit			28,713	28,713									Chapter 7
Coordinator Shipping			5,424										Chapter 1
Law Technical			17,511	17,511									Chapter 6
MIPU DPM Safety Regulator			18,600	18,600	18,600	18,600	18,600						Chapter 7
Total Capacity Building			95,995	75,832	28,200	18,600	18,600	10,000	10,000	10,000	10,000	10,000	
Total All Vt 000's	**2,008,729**	**373,565**	**103,268**	**83,105**	**35,473**	**25,873**	**25,873**	**14,400**	**14,400**	**10,000**	**10,000**	**10,000**	
Total All US$ million	**20.087**	**3.736**	**1.033**	**0.831**	**0.355**	**0.259**	**0.259**	**0.144**	**0.144**	**0.100**	**0.100**	**0.100**	

~~1210.~~1217. *Table 8.21* summarises cash flows requirements into three categories: proposed new infrastructure; rehabilitation and repairs to existing infrastructure; shipping support schemes; and, capacity building. Recoveries from VAT and additional revenue are also shown. It shows that during the period of grace (from 2011 until 2017) all infrastructure projects together would generate a cash surplus.

Table 8.21: **Cash Flows: Infrastructure, Shipping Support, Capacity Building & Recoveries**

Annual Cash Flows	2010 Vt000s	2011 Vt000s	2012 Vt000s	2013 Vt000s	2014 Vt000s	2015 Vt000s	2016 Vt000s	2017 Vt000s	2018 Vt000s	2019 Vt000s	2020 Vt000s
New Infrastructure											
Port Vila - South Paray Wharf			12,885	14,647	15,446	18,077	19,176	22,131	(19,318)	(19,414)	(14,226)
Loltong		(1,857)	(2,026)	(2,026)	(2,026)	(2,026)	(2,026)	(2,026)	(16,362)	(16,324)	(16,322)
Other Outer Islands (3)		(4,451)	(4,856)	(4,856)	(4,856)	(4,856)	(4,856)	(4,856)	(37,095)	(37,095)	(37,095)
Total New Infrastructure		(6,308)	6,003	7,765	8,564	11,195	12,294	15,249	(72,775)	(72,833)	(67,644)
Rehabilitation and Repairs											
Litzlitz		(536)	(585)	(585)	(585)	(585)	(585)	(585)	(4,526)	(4,526)	(4,526)
Simonsen		(704)	(768)	(768)	(768)	(768)	(768)	(768)	(20,072)	(20,072)	(20,072)
Lenakal		(176)	(192)	(192)	(192)	(192)	(192)	(192)	(5,325)	(5,325)	(5,325)
Slipway		4,148	4,200	4,244	4,672	4,728	5,168	5,236	(2,506)	(2,425)	(1,959)
Total Rehabilitation & Repairs		2,731	2,655	2,698	3,127	3,182	3,622	3,691	(32,428)	(32,347)	(31,881)
Shipping Support											
Shipping Services Support	(4,400)	(4,400)									
Shipping Coordinator	(7,273)	(7,273)	(7,273)	(7,273)	(7,273)						
Total Shipping Support	(11,673)	(11,673)	(7,273)	(7,273)	(7,273)						
Capacity Building											
MIPU Organisational Restructuring	(10,000)	(10,000)	(10,000)	(10,000)	(10,000)	(10,000)	(10,000)	(10,000)	(10,000)	(10,000)	(10,000)
Internal Audit	(13,712)										
Inventory		(11,008)	(9,600)								
Tariff Update	(4,606)										
Communication & Reporting	(7,428)										
MIPU Environment Unit	(28,713)	(28,713)									
Coordinator Shipping	(5,424)										
Law Technical	(17,511)	(17,511)									
MIPU Safety Regulator	(18,600)	(18,600)	(18,600)	(18,600)	(18,600)						
Capacity Building Total	(105,994)	(85,832)	(38,200)	(28,600)	(28,600)	(10,000)	(10,000)	(10,000)	(10,000)	(10,000)	(10,000)
Add back											
VAT from wharf revenues			2,132	2,185	2,240	2,296	2,353	2,412	2,473	2,534	2,598
Additional revenue tariffs & debt recovery		20,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000
Total funds added back		**20,000**	**42,132**	**42,185**	**42,240**	**42,296**	**42,353**	**42,412**	**42,473**	**42,534**	**42,598**
Total All Cash Flows	**(117,667)**	**(81,082)**	**5,317**	**16,776**	**18,058**	**46,673**	**48,270**	**51,352**	**(72,731)**	**(72,646)**	**(66,927)**

~~1211.~~1218. The rehabilitation and repairs to infrastructure (except the Slipway, which is in effect a new-build) have no identifiable revenue to support repayment of the loans. Unless a uniform method

of revenue collection is established repayment of loans would need to be fully supported by GoV funds approved in the annual budget. These subprojects have an annual operating deficit of Vt 8.4 million per annum until 2017. The annual deficit from 2018 onwards increases to Vt 81.4 million when loan repayments are included and there is still no associated sub project revenue received by the GoV.

~~1212.~~1219. Those projects that have identifiable revenue (South Paray Wharf and Slipway; based on current service charges) generate cash surpluses of Vt 17.1 million in 2012 rising to Vt 27.4 million in 2017. When loan repayments commence in 2018, financial results show a cash deficit of Vt 21.8 million, reducing should ship calls increase as forecast. To bridge the operating cash deficit in 2018 the equivalent of an annual increase in charges of five percent would be needed and would impact directly on inter island shipping cost for vessels using these facilities.

~~1213.~~1220. To reduce the fiscal impact from funding restructuring of the MIPU (Vt 10 million annually) and the annual operating deficit from 2018 for South Paray Wharf and Slipway, the GoV could revise international port and MIPU water tariffs during the grace period if a (simple) price adjustment is not favoured. Alternatively a lesser annual increase in charges for South Paray Wharf and the Slipway together with tariff and debt improved collection could also reduce the impact on inter island shipping charges.

~~1214.~~1221. The financial impact in 2012 on the GoV after taking account of proposed infrastructure (South Paray +Vt12.9M, Slipway +Vt 4.2M), reorganisation of the MIPU (-Vt 10.0M), tariff, debt adjustments and adding back the GST (+Vt 42.1M) but excluding infrastructure without existing identifiable revenue to support the sub projects, amounts to a surplus of Vt 49.2 million By 2017 this amounts to a surplus at current charges of Vt 59.8 million.

~~1215.~~1222. Similarly excluding infrastructure without identifiable revenue, in 2018 as repayments of the infrastructure for South Paray Wharf and Slipway commence, and the MIPU reorganisation, cost and tariff adjustments are taken into account, the surplus reduces to Vt 10.7 million; but is conditional upon achieving increases in the international port tariff, MIPU water tariff plus improved debt recovery as estimated - but without increases in Slipway or South Paray wharf charges. Without these increases to tariffs and improvements to debt recovery there would be a deficit of Vt 29.3 million.

~~1216.~~1223. The capacity building is estimated to cost Vt 103.3 million. Vt 85.1 million Vt 35.5 in the first, second and third years respectively of the proposed program and then Vt 25.9 million for the next two years. These costs comprise the total capacity building costs in table 8.21 plus the shipping coordinator costs less the MIPU reorganizational costs.

8.9 Financial Evaluation Shipping Support Scheme

~~1217.~~1224. There are two financial components to the Shipping Support Scheme:

- a shipping subsidy to ensure remote communities receive a minimum of four ship calls per annum – the Shipping Services Support Scheme; and
- financial support for the Shipping Coordinator Scheme.

~~1218.~~1225. The average cost to operate a vessel in Vanuatu has been assessed at Vt120,000 per day and allowance for 1.5 days per ship call averaging Vt180,000 per voyage. This cost per voyage tendered may be significantly less if the owner of the vessel can make a diversion call to a remote community, and, with potential revenue from passengers and cargoes the amount tendered would reduce further.

~~1219.~~1226. As ship owners become more familiar with each remote community and the “on-site coordinator” promoting the ship calls and communities to aggregate orders and cargoes under the Shipping Coordinator Scheme, additional passengers, cargoes and competition for them will increase until such time as volumes available and competition remove the need for any subsidies. One of the Coordinator’s tasks is to promote the demand side within remote communities. For example, there is a copra buyer in Port Vila and promotion of availability of additional supplies from both ends of the supply chain will induce further effort and investment by remote communities in such economic activities especially in the southern provinces.

~~1220.~~1227. It is a time honoured principle that “risks should be allocated to those that are best suited to manage them”. By applying this principle and avoiding the need to collect and account for

all revenue administrative costs are reduced that would otherwise accrue to the Shipping Support Scheme and risks of further unforeseen losses are also avoided.

~~1221.~~1228. The revenue from the carriage per voyage of four additional passengers and two tonnes of cargo initially each way would offset operating costs by approximately Vt 25,000. This minimum should not be difficult to achieve from remote island communities of 600 plus residents (especially in the southern province) once the date and time of each ship call is known.

~~1222.~~1229. As result of recent discussions the Shipping Services Support Scheme subsidy has been increased from Vt 3.33 million over two years to Vt4.44 million for two years, which is considered to be pragmatic.

~~1223.~~1230. The Shipping Coordinator Scheme enables local community leaders to take responsibility for their own future well-being by providing them with direct support and means of improving their economic circumstances. One important financial consideration of the scheme is that is does not involve them in the collection of money or its safekeeping. That is it requires those that wish to utilise available transport to settle their own accounts without introducing collection issues into a community that may cloud the intent of the scheme.

~~1224.~~1231. Most of the supporting reasons for each scheme are subjective and it is difficult to place financial measures on them other than the estimated costs of the inputs. The Shipping Support Scheme's success will largely depend upon the personnel selected to manage and operate the Shipping Coordinator Scheme along with their efforts in serving their communities and in turn how their communities respond.

8.10 Financing Plan Shipping Support Scheme

~~1225.~~1232. As shown in *Table 8.20* it has been assumed that the two components of the Shipping Support Scheme are to be financed as follows:

- Shipping Support Scheme by GoV appropriated funds, and
- Shipping Coordinator Scheme, plus associated capacity building, by a donor agency.

~~1226.~~1233. The funding for the subsidy could be initially financed from the cash flows as suggested in paragraph 1221. But it is assumed that the GoV will continue to support the Shipping Services Support Scheme to isolated outer island communities by an annual vote to appropriate funds. The annual amount being Vt 4.44 million for two years.

8.11 Recommendations

~~1227.~~1234. The recommendations that arise from the financial assessment and analysis fall into two categories: financial management and risk mitigation; and, those arising from the financial evaluation of the infrastructure, shipping support and capacity building.

~~1228.~~1235. To improve financial management and to mitigate risks the following institutional and capacity building assistance it is recommended that:

i) donor technical assistance (estimated at Vt 13.712 million) be sought to reinvigorate and re-establish an internal audit section in the Auditor General Office so that annual audits of government ministries are performed annually – at the same time a review and update of the financial regulations could be carried out; [see section 8.6.1];

ii) in the absence of supporting systems and lack of capacity at the MIPU an "Engineer" be engaged to oversee the quality construction of any major infrastructure work, to manage and account for the flow and disbursement of investment funds, and to provide "on-the-job" training to MIPU staff; to cover this a cost of Vt 27.724 million has been included in the capital construction costs of South Paray Wharf; [s8.7.2];

iii) donor technical assistance (estimated at Vt 7.428 million) be provided to improve communications and reporting throughout government Ministries and to reduce the costs of operation; [s 8.5.4];

iv) donor technical assistance be provided to revise and update existing international port and water tariffs (to recoup Vt 16 million and Vt 9 million respectively); and to establish ship and cargo operations performance measures; [s8.5.1];

v) donor technical assistance (estimated to cost Vt 4.606 million including work of updating the tariffs) be provided to review GoV debt policies to improve the GoV fiscal position (by Vt 15 million annually) including the application and enforcement of penalties; [s8.5.2. s8.5.1];

vi) donor technical assistance (estimated at Vt 20.608 million) be provided to implement an inventory software system for the GoV; [s8.6.4], and;

vii) consideration be given to the introduction of a job costing system when the MFEM commence a review of its current MIS with the idea of upgrading or replacing it.

~~1229.~~1236. Based on the financial evaluations it is recommended that:

viii) South Paray Bay wharf for domestic shipping and a slipway be proceeded with at an estimated construction cost of Vt 812 million for South Paray Wharf [s8.7.2] and Vt 152 million for the Slipway [s8.7.5];

ix) a program of regular but minimal price adjustments for both international and domestic wharves be implemented to improve the GoV fiscal position when loan repayments commence; [s8.8]

x) priority be given to existing infrastructure requiring urgent repairs while other subprojects without associated revenue be considered commensurate with the GoV's ability to support future loan repayments; [s8.7.4 to s8.7.9] and

xi) the GoV continue to provide annual funding to support the Shipping Services Support Scheme and that the amount to be funded reassessed annually in advance. [s8.9 and s8.10]

~~1230.~~1237. The following table summarises funding requirements and their source for new infrastructure, rehabilitation and repairs, shipping support and capacity building [table 8.20]

Table 8.22: **Finance Plan Summary**

Finance Plan: Summary	*Loans*		*Donor*					*GoV*				
	Draw Down		*Technical Assistance*									
Year (Units: 000s)	*2010*	*2011*	*2010*	*2011*	*2012*	*2013*	*2014*	*2010*	*2011*	*2012*	*2013*	*2014*
Total New Infrastructure	1,303,354	373,565										
Total Rehabilitation & Repairs	705,375											
Total Shipping Support			7,273	7,273	7,273	7,273	7,273	4,400	4,400			
Total Capacity Building			95,995	75,832	28,200	18,600	18,600	10,000	10,000	10,000	10,000	10,000
Total All Vt 000's	2,008,729	373,565	103,268	83,105	35,473	25,873	25,873	14,400	14,400	10,000	10,000	10,000
Total All US$ million	20.087	3.736	1.033	0.831	0.355	0.259	0.259	0.144	0.144	0.100	0.100	0.100