# SECTOR ASSESSMENT (SUMMARY): TRANSPORT (WATER TRANSPORT [NONURBAN])

## Sector Road Map

### 1. Sector Performance, Problems, and Opportunities

1. Tuvalu is an independent constitutional monarchy in the southwest Pacific Ocean. Formerly known as the Ellice Islands, they separated from the Gilbert Islands after a referendum in 1975, and achieved independence from the United Kingdom on 1 October 1978. The population of 10,100 live on Tuvalu's nine atolls, which have a total land area of 27 square kilometers.[1] The nine islands, from north to south, are Nanumea, Niutao, Nanumaga, Nui, Vaitupu, Nukufetau, Funafuti, Nukulaelae, and Niulakita.

2. About 43% of the population lives on the outer islands. The small land mass, combined with infertile soil, create a heavy reliance on the sea. The primary economic activities are fishing and subsistence farming, with copra being the main export.

3. The effectiveness and efficiency of maritime transport is highly correlated and integral to the economic development of Tuvalu. Government-owned ships are the only means of transport among the islands. The government fleet includes three passenger and cargo ships operated by the Ministry of Communication and Transport (MCT), a research boat under the Fishery Department, and a patrol boat.[2] The passenger and cargo ships travel from Funafuti to the outer islands and Fiji, so each island only has access to these ships once every 2–3 weeks. Table 1 shows the passengers and cargo carried by the ships in recent years. In addition to the regular services, these ships are used for medical evacuations. They also carry many Tuvaluan students to Funafuti, Vaitupu, and Fiji where secondary or higher level education is available. These ships therefore not only provide life-line support to the Tuvaluan people but also help keep them united.

**Table 1: Passenger and Cargo Data**

| Item | Fiscal Year | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015[a] |
|---|---|---|---|---|---|---|---|---|
| **Boat: Manu Folau** | | | | | | | | |
| Passengers | Number | 6,542 | 6,652 | 6,299 | 3,892 | 5,912 | 5,064 | 5,000 |
| Cargo | Cubic meters | 2,950 | 2,574 | 2,151 | 1,046 | 1,166 | 954 | 830 |
| **Boat: Nivaga II** | | | | | | | | |
| Passengers | Number | 7,650 | 8,044 | 7,862 | 3,813 | 4,559 | 6,487 | 3,592 |
| Cargo | Cubic meters | 4,403 | 2,529 | 2,084 | 982 | 957 | 1,707 | 403 |
| **Combined Totals** | | | | | | | | |
| Passengers | Number | 14,192 | 14,696 | 14,161 | 7,705 | 10,471 | 11,551 | 8,592 |
| Cargo | Cubic meters | 7,353 | 5,103 | 4,235 | 2,029 | 2,123 | 2,661 | 1,233 |

[a] 2015 data for passengers and cargo cover only 10 months to October 2015.
Source: Asian Development Bank estimates.

4. The government's fleet consists of four vessels:

(i) Nivaga II, 26 years old, originally granted by the United Kingdom in 1988 and refitted in Taiwan in 2007; gross tonnage of 1,043 tons; passenger capacity of 209; cargo hold capacity of 450 cubic meters ($m^3$); requires 31 crew;

(ii) Manu Folau, passenger and cargo ship built in 2002, granted by Japan; gross tonnage of 582 tons; passenger capacity of 80; cargo capacity of 190 $m^3$; run by 23

[1] Secretariat of the Pacific Community—Statistics for Development Division (PRISM Project). Population Statistics. http://prism.spc.int/regional-data-and-tools/population-statistics (accessed 27 September 2016).

[2] Japan donated a passenger and cargo ship in December 2015 and the Ministry of Communication and Transport is retiring the oldest passenger and cargo ship in 2016.

crew;

(iii) Nivaga III, passenger and cargo ship built in Japan 2015 and granted in December 2015 by Japan; gross tonnage of 1,270 tons; passenger capacity of 320 (international) or 429 (domestic); cargo capacity of 520 $m^3$; run with 31 crew;

(iv) Tai Manino (landing craft), procured in 2015; and

(v) A patrol boat.

5. The government has been subsidizing this transportation service quite heavily to maintain it. Table 2 shows the financial records related to maritime transport. The ship operation of the three passengers and cargo ships costs about A$3.0 million annually, while revenue from passengers and freight amounted to about A$0.5 million during 2013–2015. The passenger fare is A$20 one way in the deck class regardless of distance, while the fare for first and second class cabins is A$100–A$200. The remaining costs of about A$2.0 million are covered by revenues from the vessel registration, wharfage fees, and the government's direct subsidy of $1.2 million–$2.4 million per annum. If asset depreciation and the operation and maintenance of wharfs, docking facilities, warehousing, and other facilities are taken into consideration, the total subsidy could exceed A$5.0 million per annum. Revenue from vessel registration has been volatile in 2013–2015, with fees dropping to almost nothing in 2014 but recovering in 2015. Passenger and freight income do not cover the cost of fuel even though the fuel price has been low in these three years. Any negative variation in the fuel price would have a direct impact on the government subsidy.

**Table 2: Financial Performance of Maritime Related Activities**

(A$)

| Fiscal Years | 2013 | 2014 | 2015 |
|---|---|---|---|
| **A. Revenues** | | | |
| **1. Direct from Ship Operation** | | | |
| Passenger income: | 319,648 | 407,763 | 396,837 |
| Freight income | 176,277 | 152,521 | 132,546 |
| **Subtotal Direct Revenue** | **495,925** | **560,285** | **529,383** |
| **2. Indirect from Ship Operation** | | | |
| Vessel registration | 804,609 | 3,100 | 522,855 |
| Wharfage charges | 149,358 | 161,200 | 512,963 |
| Other income | 47,741 | 45,647 | 42,764 |
| **Subtotal Indirect Revenue** | **1,001,708** | **209,947** | **1,078,582** |
| **Total Revenue** | **1,497,633** | **770,232** | **1,607,965** |
| **B. Expenditure** | | | |
| **1. Direct for Ship Operation** | | | |
| Fuel | 817,083 | 1,018,176 | 736,334 |
| Staff | 777,894 | 915,564 | 620,650 |
| Maintenance | 905,713 | 545,877 | 1,006,566 |
| **Subtotal Direct Revenue** | **2,500,690** | **2,479,616** | **2,363,550** |
| **2. Indirect for Ship Operation** | | | |
| **Indirect Costs:** | **256,392** | **701,127** | **511,158** |
| **Total Expenditure** | **2,757,082** | **3,180,743** | **2,874,708** |
| **Profit/Loss** | **(1,259,449)** | **(2,410,511)** | **(1,266,743)** |

( ) = negative.

Source: Asian Development Bank estimates.

6. Government ships carry passengers and cargo between the capital and outer islands, but no outer island has a docking facility for them. Passengers and cargo have to be carried by small workboats that shuttle between the ship and the shore, which is dangerous when the sea is rough. Transferring between the ships and the workboats offshore is particularly dangerous because the ship and the workboats move differently. Then, the workboats have to go through a narrow channel where swells break. The workboat operators have to adjust the timing to enter

into the channel to the swells coming from offshore. Except for Vaitupu, Nanumea, and Nukufetau, the outer islands have no docking facilities even for the workboats, and passengers have to get on and off board laboriously and cargo has to be carried manually. Serious accidents have occurred during transferring, resulting in loss of lives and economic values. Over the last ten years, transfer operations are not done when the sea is rough or after dark, which reduces the efficiency of ship operations. In the consultation during project preparation, these dangers in the transfer operations were confirmed by the outer islands representatives.

7. All outer island people have safety concerns—particularly for sick people and the vulnerable including children, elderly, and people with disabilities involved in the current transfer operation. They stressed the most serious safety risk as transferring passengers between the government ships and workboats in rough seas. They all aspire to a large harbor capable of docking the government's ships, which would provide optimal safety to passengers. Building a large port that can accommodate the government ships is estimated to cost $30 million–$50 million per island, which is far above the affordable level of Tuvalu or its development partners.

8. Since Cyclone Pam hit Tuvalu in March 2015, the government and outer islands have expedited their efforts to make their infrastructure more resilient to climate risks. Nukulaelae, for example, is elevating all houses on the island to avoid damage from flooding. With assistance from the United Nations Development Programme, the government secured the Green Climate Fund for coastal protection to reduce the disaster risk. These actions require the MCT to increase its cargo transportation capacity to transport construction materials. The MCT has procured a landing craft tank (LCT) barge, but this can be used only for three outer islands because all other islands have barrier reefs that do not allow the LCT barge to access their beaches. To accommodate the LCT barge in those islands, a large ramp, channel, and turning basin should be constructed, which is estimated to cost $20 million–$30 million per island.

9. In addition to funding constraints in developing maritime facilities in Tuvalu, the environment demands careful consideration. In constructing channels through reefs, several issues need to be taken into consideration.[3] The most serious consequence is likely to be where a ponding lagoon is breached.[4] On a ponding lagoon, the reef crest acts as a dam and traps water during low tide, which is often an obstruction to boat passage. Breaching a reef crest to form a channel will effectively remove the dam wall and drastically increase the water flow between the ponding lagoon and the ocean outside. This may significantly affect fishery yields in the ponding lagoon.

10. The coastal environment is a dynamic environment, with sand continually moving along the shore and on-and-off shore. Any new infrastructure needs to take into account this dynamic to ensure there is no net erosion or accretion. Vehicle access across the beach is essential to enable mechanized unloading from workboats. Unfortunately, the solid concrete ramps currently used have caused high levels of erosion at a number of locations. Given this, any construction of infrastructure must be designed through careful consideration of the coastal processes.

### 2. Government's Sector Strategy

11. The sector strategy outlined in the government's National Strategy for Sustainable

[3] Cardno. 2007. *Updated Pre-Design Environmental Working Paper in Tuvalu Ship to Shore Transport Project Design Document.*

[4] Five islands of Tuvalu—Funafuti, Nanumea, Nui, Nukufetau, and Nukulaelae—have a ponding lagoon, while that of Funafuti is wide open to the ocean with many channels.

Development, 2016–2020 (Te Kakeega III) recognizes that sea transport and shipping services among the eight outer islands remain a difficult challenge.[5] Servicing these communities by being able to ship greater volumes of bulk cargo more frequently is a development priority. The strategy also states that an interval of 2 months or more between ship visits is unacceptable. It tasks the Ministry of Home Affairs and Rural Development and the MCT with working together to produce outer island shipping schedules that minimize disruptions—a common characteristic of past shipping schedules—to maximize shipping efficiency for cargo and passengers.

12. The MCT strategy includes (i) alternative international air and sea services to be considered; (ii) the provision of safer boat passages on all outer islands; (iii) the provision of adequate shipping services to the outer islands; and (iv) the provision of more accurate and reliable observations, forecasts, and warnings of weather and climate. These objectives are backed up with refitting and maintenance programs for the five government-owned ships.

13. The Tuvalu Infrastructure Strategy and Investment Plan prepared in 2012 is being updated in 2016, including maritime transport. The strategy focuses on developing the shipping services though expansion of the fleet and upgrading of outer island ports with a medium-term perspective. The investment plan includes the Asian Development Bank (ADB) Outer Island Maritime Infrastructure Project for the four prioritized islands: Nanumaga, Niutao, Nui, and Nukulaelae.

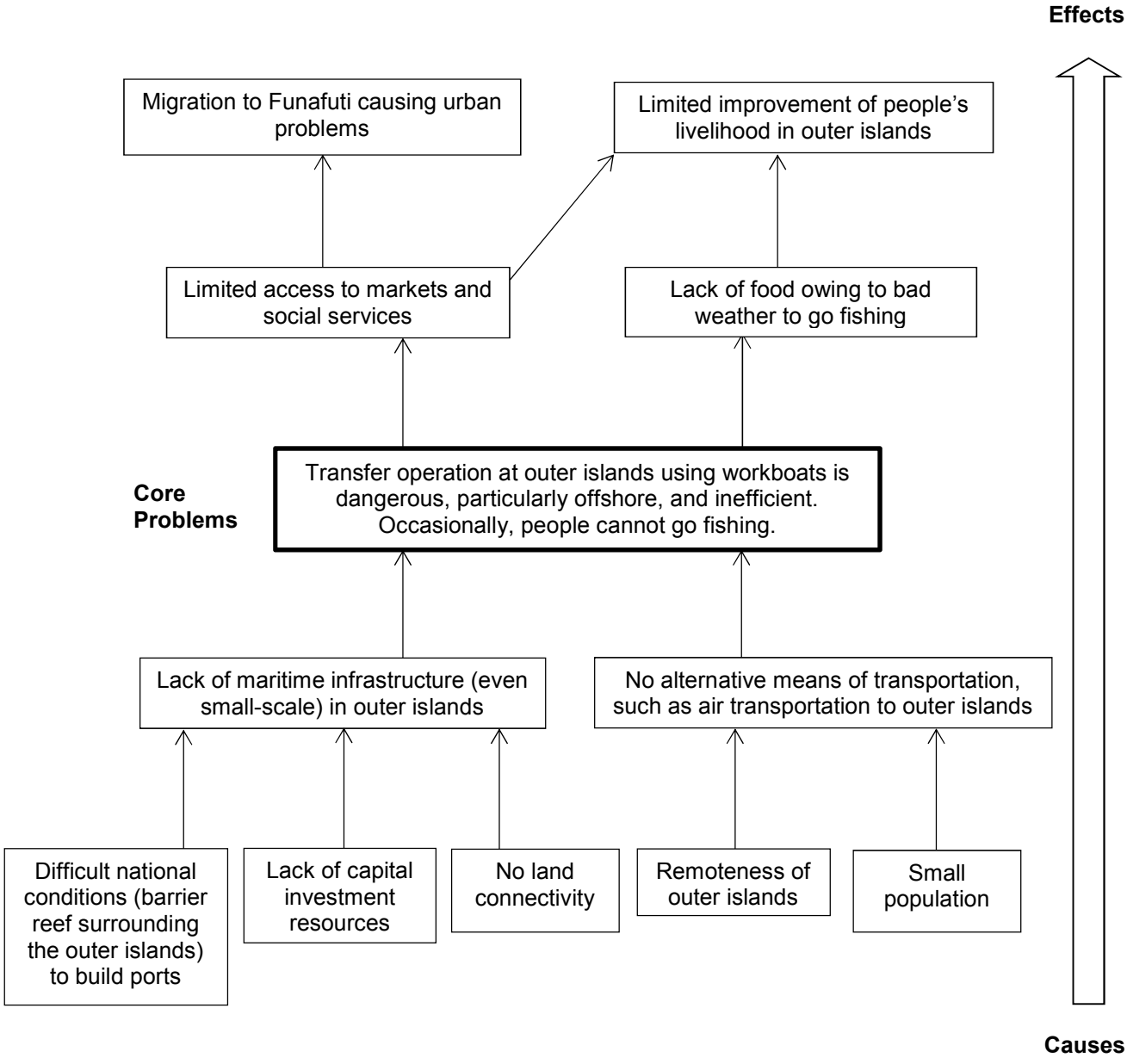
14. The infrastructure strategy includes a whole-life approach, covering operation and maintenance (both routine and periodic maintenance). This approach includes the application of investment criteria (multi-criteria analysis) for the prioritization of major infrastructure projects, including linkages to the original Tuvalu Infrastructure Strategy and Investment Plan, and Tropical Cyclone Pam Recovery and Vulnerability Reduction Pan. The strategy goes to some lengths to explain that identifying the operation and maintenance cost will ensure adequate fund allocation, but failure to identify could result in non-allocation for the required funds.

## 3. ADB Sector Experience and Assistance Program

15. ADB has provided many technical assistance projects in Tuvalu, particularly in the public financial management sector. Only one investment project has been provided to Tuvalu—an education project to improve the Tuvalu Maritime Training Institute, which provides seafarers to the world's merchant navies and increases remittances of foreign currency into Tuvalu. The proposed outer island infrastructure project is the first opportunity for ADB to assist the transport sector, apart from technical assistance in 1994.

[5] Government of Tuvalu. 2016. *Te Kakeega III: National Strategy for Sustainable Development, 2016–2020.* Funafuti.

**Problem Tree for Transport (Water [Nonurban])**




Source: Asian Development Bank.