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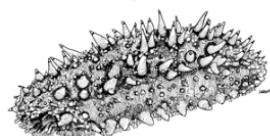
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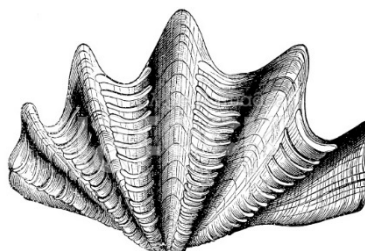


Acronyms

| | |
|------------|---|
| ACIAR | Australian Centre for International Agricultural Research |
| ADB | Asian Development Bank |
| AusAID | Australian Agency for International Development |
| CAS | Country Assistance Strategy |
| CEO | Chief Executive Officer |
| CPI | Consumer Price Index |
| CSIRO | Commonwealth Scientific and Industrial Research Organisation |
| DEVFISH II | Development of Tuna Fisheries in the Pacific ACP Countries Project II (EU) |
| DRM | Disaster Risk Management |
| EEZ | Exclusive Economic Zone |
| EIA | Environmental Impact Assessment |
| EU | European Union |
| FAO | Food and Agriculture Organisation of the United Nations |
| FAOSTAT | FAO Statistics website http://faostat.fao.org/default.aspx |
| FFA | Pacific Islands Forum Fisheries Agency |
| GDP | Gross Domestic Product |
| GEF | Global Environment Facility |
| GFDRR | Global Facility for Disaster Reduction and Recovery |
| GoT | Government of the Kingdom of Tonga |
| GPS | Global Positioning System |
| HACCP | Hazard Analysis and Critical Control Points |
| HIES | Household Income and Expenditure Survey |
| IFAD | International Fund for Agricultural Development |
| IMF | International Monetary Fund |
| IUCN | International Union for Conservation of Nature |
| JICA | Japan International Cooperation Agency |
| JNAP | Joint National Action Plan |
| M&E | Monitoring and Evaluation |
| MAFF | Ministry of Agriculture and Food and Forests |
| MoF | Ministry of Fisheries |
| MFNP | Ministry of Finance and National Planning |
| MLNR | Ministry of Lands & Natural Resources |
| MEIDECC | Ministry of Meteorology, Energy, Information, Disaster Management, Environment, Climate Change & Communications |
| MoFNP | Ministry of Finance and National Planning |
| MORDI | Mainstreaming of Rural Development Tonga Trust |
| MOU | Memorandum of Understanding |
| MPE | Ministry of Public Enterprises |
| NFC | National Fisheries Council |
| NGO | Non-Government Organization |
| NTB | Non-Tariff Barrier (to trade) |
| PFSP | Pacific Fisheries for Food Security Program |
| PICTS | Pacific Island Countries and Territories |
| PNA | Parties to the Nauru Agreement |
| SPC | Secretariat of the Pacific Community |
| SPC-FAME | SPC Division of Fisheries, Aquaculture and Marine Ecosystems |
| TASP | Tonga Agriculture Sector Plan |
| TBEC | Tonga Business Enterprise Centre |
| TFSP | Tonga Fisheries Sector Plan |
| TRIPVEPA | Vava'u Environmental Protection Association |
| WB | World Bank |
| WCPFC | Western Central Pacific Fisheries Commission |

INTRODUCTION

1. The purpose of the Tonga Fisheries Sector Plan for the Kingdom of Tonga is to:
 - a) identify priority areas for investment that will maximise the sustainable contribution of the fisheries sector to food security and economic growth
 - b) present and cost specific programs/activities to achieve these priorities
 - c) identify possible sources of financing for the specific programs/activities
 - d) provide a framework for implementation and to monitor progress in the short- to medium-term.
2. This Tonga Fisheries Sector Plan (TFSP) is designed to provide a basis for dialogue on the priorities, programs and implementation modalities. The plan addresses extensive comments¹ made on a previous draft by private sector and civil society stakeholders. The TFSP identifies:
 - a) the strategic objectives for the Tongan fisheries sector
 - b) the key programs to achieves these objectives
 - c) the links between programs (or subprograms) and their respective objectives using a coherent results framework;
 - d) approximate costings of the programs/subprograms; and
 - e) suggests implementing mechanisms and arrangements for the TFSP .
3. In order to substantiate and reach a common understanding of the priorities, policy initiatives and interventions, the plan also provides an analysis of the state of the fisheries sector, the challenges faced and the proposed solutions. The findings are structured to facilitate potential development partners in identifying potential strategic interventions and how such interventions could complement each other in relation to country programmes and planned projects. The terms of reference for preparation of the TFSP were endorsed by Tonga's Ministry of Agriculture and Food, Forests and Fisheries (MAFFF) and the Fisheries Growth Committee (FGC) and the process has been supported by the World Bank in collaboration with IFAD. Other development partners, including New Zealand, have expressed strong support for development of a fisheries sector plan for Tonga.
4. Following dissemination² and further discussion of the TFSP, particularly in the outer islands, it is anticipated that upon approval, priority investments and activities would be implemented by drawing on both internal and external resources.



¹ Discussions held during March 2015.

² Translation of the TFSP to Fakatonga is recommended, in particular translation of key elements of the proposals on community fisheries and beche-de-mer fisheries in order to enable informed dialogue in the outer island communities.

PART I. ANALYSIS OF THE STATE AND FUTURE PROSPECTS FOR TONGA'S FISHERIES

1 COUNTRY BACKGROUND AND CONTEXT

1.1 COUNTRY BACKGROUND

5. With a population of over 105,000, Tonga's growth has averaged about 1.5% per annum since 2000. The economy (GDP US\$0.5 billion; GDP per capita US\$4,430) is heavily dependent on development assistance (15% of GNI) and remittance inflows (30% of GNI). There are three main island groups spread over some 500 km (see map in annex 9): Tongatapu, the southern-most island group with a population of 80,000); Ha'apai, a central archipelago of 62 mainly coralline islands (population, 6,650); and Vava'u, the northern group of raised coral islands with high tourist potential (population, 15,000). Two small seamount islands – the Niuaus – lie a further 220km to the north (population, 1,200). Tonga's Exclusive Economic Zone (EEZ) of about 700,000 square kilometres is about ten times the size of its land surface. Tonga has not declared an archipelagic zone.

6. In common with many other Pacific Island Countries (PICs), Tonga is heavily dependent on its fisheries and ocean resources for food, transport, economic development and culture. Like other PICs, Tonga's economy is characterised by a lack of economies of scale due to its small size, costly market access due to its distance from markets, a weak manufacturing base and limited labour pool. The economy is heavily dependent on agriculture (21% of GDP), tourism and fisheries (2-7% of GDP)³. Rural communities are particularly dependent on agriculture and fisheries and many are highly vulnerable⁴ to extreme weather events. Tonga's population is declining with outmigration resulting in an extensive diaspora in Pacific countries generating substantial remittances and export markets for traditional Tongan products. Tonga and its fishing communities are also in the front line of climate change - threatened by erratic rainfall, extreme weather events, sea-level rise, and loss of coral reefs from rising oceans temperatures, ocean acidification and local environmental degradation. In 2014, Tropical Cyclone Ian hit Tonga, mainly affecting the Ha'apai group and causing economic and physical losses estimated to be US\$49.5 million (or about 11% of Tonga's GDP). Models suggest that, on average, Tonga may incur losses of US\$15 million per year (4% of GDP) due to natural disasters, including earthquakes and cyclones. Isolation and scale also means that Tonga and rural communities face challenges in access to markets, high costs of transport and energy. About 15% of households own fishing gear and about 5% own a boat, or canoe. About 25% of households in Tonga are estimated to currently live below the basic needs poverty line⁵ and poverty is most prevalent in the more isolated island communities heavily reliant on subsistence and cash fishing and farming⁶.

7. Socially and politically, Tonga differs from other Pacific Island Countries (PICs). It is a monarchy with an elected parliament and a significant proportion of the land held by nobles. A person's inherited status and rank underlie important social status and working relationships which are also guided by key values including respect (*faka 'apa'apa*) and reciprocity and responsibility for others (*fetokoni'aki*). The social framework emphasises group harmony to enable the collective interest to override individual interests.

1.2 NATIONAL DEVELOPMENT PLANS AND POLICIES

8. The National Strategic Planning Framework (NSPF), approved in 2009/10, sets out a vision for Tonga's development: "To develop and promote a just, equitable and progressive society in which the people of Tonga enjoy good health, peace, harmony and prosperity, in meeting their aspirations in life". The Tonga Strategic Development Framework 2011–2014 (TSDF) provides the guiding principles and directions for a four-year period. Sector plans, ministry corporate plans and annual management plans detail actions to deliver these strategies and their respective budget allocations. The preparation of the Fisheries Sector Plan is a contribution

³ Fisheries currently accounts for 2% of GDP, while the recent average is 7%. The value has fluctuated substantially as a function of the production from the main export fisheries (tuna, snapper, bech-de-mer, seaweed and ornamentals).

⁴ Out of 171 countries, Tonga is ranked second most vulnerable to natural disasters (World Risk Report, 2013).

⁵ <http://www.indexmundi.com/g/r.aspx?c=tn&v=69>

⁶ <http://asia.ifad.org/web/tonga/overview>

to the TSDF. A new TSDF⁷ is currently being finalised. However, little change is expected in the vision, key objectives, desired outcomes and enabling themes. The TFS II guides the formulation of sector plans and budgetary resource allocation and provides national development indicators and targets. It also provides the framework to link sector plans to the regional and district plans, emphasises transparency, sustainable use of natural resources and improved resilience to natural disasters and climate change and makes specific reference to preparation of a natural resources policy; to the preparation of fisheries and agriculture sector plans and to their associated growth committees. The TSDF 2011-2014 emphasises the following nine outcome objectives, grouped below in terms of their perceived application to the fisheries sector.

*Box 1. Linking Tonga's Strategic Development Framework objectives to the fisheries sector**

Sustainable community fisheries

Strong inclusive communities, by engaging districts/villages/communities in meeting their prioritised service needs and ensuring equitable distribution of development benefits.

Cultural awareness, environmental sustainability, disaster risk management and climate change adaptation, integrated into all planning and implementation of programmes

Sustainable commercial fisheries

Dynamic public and private sector partnership as the engine of growth, by promoting better collaboration between government and business, appropriate incentives and streamlining of rules and regulations. (through the National Fisheries Council, Special Management Areas, fisher and exporter associations, development of an aquaculture investment policy, adaptive management of fisheries)

Safe, secure and stable society, by maintaining law and order. (activities on compliance, safety at sea..)

Public and private investment

Appropriate, well planned and maintained infrastructure that improves the everyday lives of the people and lowers the cost of business, by the adequate funding and implementation of the National Infrastructure Investment Plan (NIIP).

Improved fisheries governance

Better governance, by adopting the qualities of good governance, accountability, transparency, anti-corruption and rule of law.

* The TSDF objectives are presented in relation to the four proposed focal areas of the Fisheries Sector Plan.

9. Four enabling themes orientate the public policy aspects of the TSDF: (i) more efficient and effective government by focusing on its core functions, such as, improving coordination, service delivery and optimising use of resources; (ii) ensuring a more coordinated whole of government approach in Tonga's partnership with development partners; (iii) ensuring public enterprises are sustainable and accountable, and where appropriate moved into the private sector; and (iv) improving the macroeconomic environment and fiscal management, including effective revenue services.

10. The detailed descriptions of the TSDF objectives provide additional guidance for development of a Tonga Fisheries Sector Plan. For example, at community level there is emphasis on the outer islands, gender, youth and the disadvantaged. Fisheries, value-added production and technical capacity building is specifically targeted in the development of public and private sector partnerships. The fisheries economy can benefit from and help support improved transport infrastructure, communications and power and water supply. Improved education and workforce skills can underpin the sustainable use of living marine resources and potentially drive import substitution to improve nutrition through increased fish consumption. Weak compliance with fisheries rules and regulations can be addressed through initiatives to improve the rule of law and transparency.

11. The TSDF stipulates improved inter-sector coordination and several sector policies and plans are directly relevant to the preparation of a sector plan for fisheries. These include the infrastructure plan (2013-2020)⁸, the tourism roadmap⁹ and the climate change and disaster management plan¹⁰, (see below). Consistent

⁷ Draft Tonga Strategic Development Framework II: A more progressive Tonga: enhancing our inheritance 2015-2025 3 March 2015.

⁸ Tonga National Infrastructure Investment Plan 2013-2023.

with the longer-term framework, more recently the national budget 2014/2015 is focused on the following four key areas: (i) supporting growth through focused interventions to build targeted productive sectors, improving the business climate, including provision of infrastructure and the development of national human resources; (ii) community development with an additional focus on protecting vulnerable groups; (iii) maintaining macroeconomic stability; and (iv) improving governance and public administration, with better accountability, budgeting, and delivery of public services. In addressing these priorities, government has recognized the critical need to address longer term issues such as climate change and increased vulnerabilities to disasters. Key fisheries guidelines and policy orientations are provided through the economic dialogues and in the corporate plan.

12. Foreign investment in a number of fisheries activities is prohibited¹¹, including reef fishing, inshore fishing within 12 nautical miles in water less than 1000 meters and bottom fishing in water depth less than 500 meters. A limited number of tuna longline fishing licenses are granted to foreign (mostly Asian) vessels. The license fee revenues and landing obligations for these vessels have varied over time and the government has recognised the need for improved shore infrastructure to capture an increased share of the potential value of foreign fishing.

1.3 FOOD SECURITY

13. Food security and nutrition in Tonga face a number of challenges: (i) modest agricultural productivity combined with depletion of several key food fisheries resources; (ii) poor diet; (iii) rising food imports; and (iv) weak economic growth. At community level, these challenges are to some extent offset by the cultural propensity to share food amongst households.

14. Agricultural productivity and markets are discussed in the Tonga Agriculture Sector Plan prepared as a companion plan. Diet-related diabetes, high blood pressure, and heart disease are among the primary health concerns. These are directly related to poor diet, a significant part of which consists of imported foods, particularly high fat, low quality meats and low fibre carbohydrates. The less nutritious imported products tend, not only to be lower priced, but are also more available (e.g. imported frozen chicken or canned corned beef versus fresh local fish). Over 5,000 tons of meat products are imported annually, suggesting considerable room for import substitution, for example with tuna bycatch, or less marketable tuna and pelagic species. The possibility of linking of meat imports to investment in import substitution could be further explored¹². The total value of the annual national food import for Tonga doubled between 2000 and 2010 and was accompanied by a 110% increase in the cost of local food and 130% increase for imported food for the same period¹³. Approximately 51% of total household consumption expenditure is on food. Food represents 46% of the Consumer Price Index (CPI), and Fish, Meat & Poultry have a weight of 18% with the imported component weighted at 79%, suggesting that some 80% of animal protein is imported.

15. More accurate records¹⁴ of fish imports are required to precisely identify the imports and their respective average prices. However, canned fish (mackerel, tuna and sardines) appear to constitute the most important group in terms of food security. Approximately 1400 tons per year (2008-2012) of canned fish is imported at an average price of US\$ 1.8 per kg and worth approximately US\$ 2.5 million. Anecdotal information suggests that the competitive price, convenience and nutritional value of canned fish make these products highly competitive, as the price of local fish precludes regular consumption by many households. This is also evident on the outer islands where there is limited purchasing power and fishers send the surplus to Tongatapu. Trends in the CPI for Fish, Meat & Poultry suggest that import prices are more erratic than prices of local products and since 2013 show a slight decrease, while the price of local products has gradually increased (see figure, section 9). GDP projections based on the HIES suggest that expenditures on fish consumption have increased (see section 9). Further analysis of available fish price information collected for preparation of the CPI may indicate trends in the quantities consumed.

⁹ TRIP Consultants, 2013. Tonga tourism sector roadmap 2014 – 2018. Draft for discussion.

¹⁰ Ministry of Environment and Climate Change (MECC) and National Emergency Management Office (NEMO), Joint National Action Plan on Climate Change Adaptation and Disaster Risk Management 2010–2015. Tonga, July 2010.

¹¹ Foreign Investment Act 2012 (Revised Edition, 38.18). Reserved List.

¹² Fiji has banned the sale of certain fatty foods on health grounds in order to be compliant with WTO regulations.

¹³ MAFFF & SPC, 2012. Tonga National Food Summit. Nuku Alofa, Tonga.

¹⁴ A number of fish imports appear to be mis-classified in the import statistics.

16. A recent review¹⁵ of food security in Tonga recommended five “strategic actions” which are highly relevant to and would be of direct benefit to the fisheries sector: (i) address the food policy implementation gap; (ii) enhance political leadership on food security; (iii) improve coherence, coordination and sustainability of government activity on food security; (iv) strengthen the voice, participation and protection of vulnerable and marginalised groups in food policy and actions; and (v) shape and develop local data to optimise its use in decision making to improve food security in Tonga. While parliament has reviewed a ‘food bill’ which addresses the legislative dimensions of some of these issues, implementation of a comprehensive food security strategy has proved challenging.

17. The key food security action for the fisheries sector is to secure the sustainability of the coastal resources, both for incomes and direct food consumption. Several attempts have been made to increase catches of coastal pelagics. However, the relatively poor oceanic waters around Tonga do not appear to support a significant fishery, though a changing climate (see below) is projected to enhance oceanic fish stocks in Tonga. If viable tuna processing operations (loining, retail packs) can be developed, preferably based on expanded landings from Tongan vessels, the bycatch and non-exported products can expand local market supplies. Finfish aquaculture is unlikely to make a significant contribution to local food fish supplies because of production costs. However, culture of bivalves (such as cockles and clams) could provide a much needed increase in supplies. A greater awareness of the nutritional value of fish, particularly for children and expectant mothers¹⁶, can be promoted as part of a national food security effort¹⁷. A closer examination of trade issues as part of a national food policy may also provide guidance and opportunities¹⁸. In conclusion, significant import substitution of fish or meat products by local production of fish will remain challenging because of the price differentials. Improved health and productivity of the inshore fisheries is the key food security action for the sector. Based on a sound business cases, expansion of the production of coastal pelagics and bivalve molluscs (including through aquaculture) could increase domestic supplies. Fish import replacement opportunities are limited as most of the imported fish is low cost canned mackerel and similar convenience products which do not require refrigeration.

1.4 ENVIRONMENT AND CLIMATE CHANGE

18. In Tonga, there is no stand-alone policy on Environment. Policies are fragmented amongst different sectors for coordinating implementation and reporting. This includes the national biodiversity action plan¹⁹, waste management strategy, land use policy, forest management policy, an energy roadmap, environmental impact assessment (EIA) process and a consolidated climate change adaptation and disaster management initiative, to name a few, all of which addresses key environmental challenges.

19. The main risk to the marine environment is the loss of a high proportion of Tonga’s coral reefs due to a combination of rising ocean temperatures, ocean acidification, overfishing exploration for deep sea minerals and pollution (see section 2.7.1). Over a third of Tonga’s coral reefs are threatened by overfishing (moderate risk or higher). The biodiversity action plan targets healthy and sustainably managed priority marine ecosystems and habitats including coral reefs, slope and seamount fisheries areas, priority spawning and feeding sites. A number of endangered marine species are present in Tongan waters, including the Humpback whale (recovering) and the vulnerable manta ray²⁰ both of which have high tourism value. A number of marine parks and reserves have been established under the Park and Reserve Act and their conservation success is reported to be quite variable and the enforcement of the legislation remains weak. An initial economic assessment and valuation of Tonga’s marine and coastal ecosystems was recently undertaken²¹ suggesting the annual value of these resources to be

¹⁵ Anna Matheson, Sunia Foliaki and Don Matheson, 2013. Improving health through achieving Food Security in Tonga: a way forward. Funded by World Health Organization (Suva Office). September 2013.

¹⁶ Tonga Department of Statistics and Tonga Ministry of Health, SPC and UNFPA. 2013. Tonga Demographic and Health Survey, 2012.

¹⁷ See: Vaioleti, L. 2014. The Tonga Food Road Map 2014 – 2064

¹⁸ Evans, M. et al., 2001; Seccombe, M. 2012

¹⁹ Department of Environment, 2006. Kingdom of Tonga. National Biodiversity Strategy & Action Plan. June 2006.

²⁰ It has been estimated that a dead manta is worth US\$40 to \$500 while manta ray tourism can bring in US\$1 million during the life of a single manta ray (O’Malley MP, Lee-Brooks K, Medd, H.B. 2013. The Global Economic Impact of Manta Ray Watching Tourism. PLoS ONE 8(5).

²¹ By the Marine and Coastal Biodiversity Management in Pacific Island Countries (MACBIO) in association with the environment ministry. Note: Considerable caution must be exercised in interpreting ecosystem valuations, e.g. see: Zurlini, G., Jones, K., Li, L., & Petrosillo, I. (2010). Potentials of ecosystem service accounting at multiple scales. <http://www.eoearth.org/view/article/155326>

more than TOP33million dollars in coastal protection, tourism, fisheries, construction materials, and in cultural and recreational benefits.

20. Management of the coastal and marine environment is a complex task, involving many organisations and individuals, and requires action at local and national scale. The Government recognises that better coordination and cooperation between the Private Sector, Government and Society is needed to achieve its aspiration of an sustainable, competitive and fair economy, government and society. Ecologically sustainable development in Tonga means that environmental considerations underpin decision-making in all sectors of activity; it is essential to achieving the national economic visions. This means addressing the Tongan coastal and marine environment as a whole – including current and future natural and human values and uses.

21. Government is taking an Integrated Marine Spatial Planning approach, which will use and bolster existing consultative and coordination structures to limit the additional burden upon both the government and her people of this new planning process. The plan includes waters from the high-tide mark out to the Exclusive Economic Zone. It is a process that goes beyond the traditional ways of planning and managing activities on an individual sectoral basis. Integrated marine spatial planning is the only way that Tonga can achieve both its economic and social goals alongside its aspirations for retention of the cultural and traditional values and uses tied to her ocean resources. Integrated marine spatial planning will support sustainable and environmentally sensitive development and shall provide the Kingdom of Tonga, for the first time, a framework that facilitates integrated strategic and holistic planning in relation to all activities within its coastal and marine area.

22. Tonga had established a Waste Authority (under the Waste Management Act 2005) to address the problem of solid waste collected under a tariff scheme. Sewage is handled by septic tank system. Of particular note is the effort to arrest the degradation of Fanga'uta Lagoon, Tonga's largest enclosed lagoon, which occupies a large part of the main island, Tongatapu. The lagoon is an enclosed, soft-bottom, shallow tropical lagoon system. It supports several types of very diverse and productive ecosystems, including mangroves, mudflats, seagrass beds, and coral patch reefs and contributes to the sustainability of the Tongatapu Island's coastal fisheries. However, over the years with increase in residential areas around the coast, the lagoon has served as a sedimentation pond, with increasing eutrophication, turbidity and pollution, limiting its use as an aquaculture site. A recent GEF project²² aims to conserve the ecosystem services of the Fanga'uta Lagoon through an integrated land, water and coastal management approach thereby protecting livelihoods and food production and enhancing climate resilience.

23. Tonga's Energy Road Map (TERM)²³ is the guiding document for actions and development partner support for the energy sector. The objective is *"to lay out a least cost approach and implementation plan to reduce Tonga's vulnerability to oil price shocks and achieve an increase in quality access to modern energy services in a financially and environmentally sustainable manner"*. The TERM specifies least cost and cost recovery approaches and minimizing local social and physical environmental impacts by aligning efforts with global goals on climate change.

1.4.1 Climate change adaptation and disaster risk management

24. Over the course of the 21st century Tonga's surface air temperature and sea surface temperature are projected to continue to increase (very high confidence); wet season rainfall is projected to increase (moderate confidence); the intensity and frequency of days of extreme heat are projected to increase (very high confidence); the intensity and frequency of days of extreme rainfall are projected to increase (high confidence); and mean sea-level rise is projected to continue (very high confidence)²⁴.

25. The fisheries sector will be significantly affected by climate change. The combination of increased sea temperature and ocean acidification will result in a gradual deterioration of the coral reefs, altered reef ecology, a likely reduction in the abundance and diversity of reef species and a change in the fish catch composition. Some effects could be positive, but the scientific consensus favors a reduction in reef productivity with respect to most commercial and food fish species. Reef deterioration will also reduce the natural coastal defences and combined with sea level rise will cause increased coastal erosion and heightened vulnerability to storm surges. Under the B1/A2 scenario projections, by 2035 coral cover will decline by 25-65%; mangrove area by 30%;

²² UNDP, Govt. of Tonga, Integrated Environmental Management of the Fanga'uta Lagoon Catchment. Project Document.

²³ Tonga Energy Road Map 2010 - 2020. A Ten Year Road Map to Reduce Tonga's Vulnerability to Oil Price Shocks and Achieve an Increase in Quality Access to Modern Energy Services in an Environmentally Sustainable Manner: Final Report. <http://www.sids2014.org/content/documents/156Energy%20Strategy.pdf>

²⁴ Australian Bureau of Meteorology and CSIRO, 2011.

seagrass area by 5-10%; and demersal fisheries by 2-5%. Nearshore pelagic fisheries are projected to increase by 15-20%.

26. Increased frequency and intensity of tropical cyclones and associated storm surges, combined with sea level rise²⁵ will have detrimental impacts on all sectors including the fishing and tourism industries. Impacts will include loss or damage to boats and productive infrastructure (e.g. fish processing and landing facilities, hotels, beaches, and communications), housing, social infrastructure and crops. In addition to these climate-induced threats, fishing communities are vulnerable to tsunamis: the Niuatoputapu (2009) tsunami reached maximum height of 16.9m on the southeast coast. Flow heights were between 4–7m above mean sea level along the western coastline where the main villages are located. In addition, erratic rainfall patterns are likely to affect water supply on coraline islands, potentially threatening the freshwater lens if groundwater is extracted for household, or agricultural use²⁶.

27. Tonga has a combined climate change and disaster risk management action plan²⁷. The Joint Action Plan on Climate Change Adaptation and Disaster Risk Management (JNAP) consolidates the climate change and disaster management activities and focuses on several key actions: (i) improved governance, including decision-making and policy frameworks; (ii) improved technical knowledge and popular education; (iii) vulnerability assessments; (iv) efficient, renewable energy; and (v) strong national and international partnerships. Implementation of the TFSP will need to contribute to and be closely coordinated with these activities through existing arrangements²⁸.

1.5 INFRASTRUCTURE AND TOURISM

There is a symbiotic relationship between tourism and fisheries which is not adequately reflected in the relationships between these sectors. On one hand, the volume of exports of fresh fish is limited by the air cargo capacity of the aircraft serving Tonga. The size of these aircraft is closely linked to the level of tourism. On the other hand, Tonga's tourism is essentially marine-based and healthy coasts and seas are vital for the industry. Tonga has developed a tourism roadmap, focused largely on the 'front end' – marketing, hotel and service development. The TFSP would develop formal arrangements and joint programmes with the tourism and environment authorities and stakeholders to increase the sustainable benefits through tourism: for example through arrangements between hotel resorts, or dive and sport fishing operators and SMAs, through development of off-season tourist activities and through expanding air and sea transport capacity.

The role of the infrastructure investment plan²⁹ is to ensure 'appropriate, well planned, and maintained infrastructure that improves the everyday lives of the people and lowers the cost of business'. Its focus is on connecting Tonga (transport and communications), community infrastructure, affordable energy and resilience to climate change and natural disasters. A priority of the maritime sector investment is to improve inter-island transport, including its safety and the resilience of port infrastructure to climate change and natural disasters. The plan also provides guidance on the financing and maintenance of public investments in infrastructure.



²⁵ Records indicate that sea level rise in Tonga suggests is in the order of 6.4mm/yr (1993 to 2007) (TMS, Tonga, 2007).

²⁶ White, I, Falkland, T., Fatai, T. 2009. Vulnerability of groundwater in Tongatapu, Kingdom of Tonga. Groundwater evaluation and monitoring assessment. Australian National University, Canberra, Australia.

²⁷ Joint National Action Plan on Climate Change Adaptation and Disaster Risk Management 2010–2015.

²⁸ The National Environment and Climate Change Committee (NECCC) has the mandate for coordination of all activities relating to the environment, climate change (adaptation and mitigation) and impact assessments. The National Emergency Management Committee (NEMC) has the responsibility for DRM capacity building in Tonga.

²⁹ Pacific Region Infrastructure Facility, 2013. Tonga National Infrastructure Investment Plan 2013 -2023

2 THE FISHERIES OF TONGA: STATUS AND ANALYSIS

2.1 FISHERIES POLICY

28. Tonga Fisheries Sector Review, Volume 1, 2, & 3, 1998³⁰ provided one of the most comprehensive studies of this sector. Volume 1 of this sector review represents a consolidation of reports from the eight specialist consultants. Volume 2 consists of the 32 issue papers prepared by the Sector Study team, Volume 3 focused mainly on policy/implementation and contains suggestions for follow-up projects. It is unfortunate that this comprehensive document was not consistently referred to and followed up the policy and implementation plan. Guidance for the development and management of fisheries has been provided by the fisheries legislation and the various fisheries management plans. However the Fisheries Management Act (2002) does not include a statement of objectives. Many of the management plans focus on regulatory measures, but in many cases development measures, targets and mechanisms to engage stakeholders in a sustainable resource use roadmap are often weak or lacking. Other policy statements are dispersed in Tonga's statements in international fisheries fora. As outlined above, many of the policies and plans developed for other sectors already provide guidance on priorities for the fisheries sector, through contribution to these plans and strategies.

29. The responsible minister is charged³¹ with ensuring the long term conservation and sustainable use of fishery resources, and to this end to adopt management measures which promote the objective of optimum utilisation and to achieve economic growth, human resource development, employment creation and sound ecological balance. The minister also has responsibility for the control, management and development of aquaculture and any related activity, whether on land or in any aquatic area including marine areas.

2.1.1 Implementation of the NSDF through the Fisheries Growth Committee

30. A national economic dialogue³² held in 2012 identified a range of actions to stimulate the Tongan economy, many of which have already been carried out. As a result of this dialogue, a Fisheries Growth Committee (FGC) was established³³ to provide a platform for high-level dialogue between government and industry and to help implement and monitor policies and plans. An upgrading of the Fisheries Division to a its previous status as a Fisheries Department, separate from Agriculture and Forestry and headed by its own CEO has been approved by cabinet but yet to be recruited. However, such institutional changes will need to be based on a clear vision for the sector and associated prioritisation of public resources. The National Fisheries Council (NFC), an umbrella private sector organisation has been established and has representation on the FGC, with the intention of strengthening the working relationship between the fishing industry and Government.

31. To improve the business climate and reduce cost of doing business a Fishing Consumer Tax Exemption was approved in June, 2013 exempting imported fishing gear, bait and essential supplies from customs tariffs. In November, 2013 the operation of the Tu'imatamoana fish market (Nukualofa) was transferred under an MOU from MAFFF to NFC. A similar arrangement has been made for the fisheries facilities in Niafu (Vava'u) and a private operator has provided an ice machine. There are ongoing discussions between MAFFF, the Ministry of Public Enterprise, the Tonga Port Authority and the NFC with regard to the improvement and management of the 'fisheries wharf' in Nuku'alofa (see annex). Access to finance has been improved through a soft loan facility, initially operated by MAFFF and subsequently transferred to the Tonga Development Bank (TDB). The Fisheries Development and Export Fund (FDEF) has been capitalised with T\$ 300,000 available at 1% interest for 9 months (period may be extended) with a limit of T\$ 30,000 per loan. Potential borrowers have difficulty in accessing the funds for several reasons: (i) inability to meet TDB security requirements; (ii) weak business plans and lack of evidence of a successful business history; and (iii) inability to meet the contribution required (e.g. 20% own funding). A portion of the available credits have been used to rehabilitate snapper vessels. A further T\$750,000 is also understood to have been approved with a focus on tuna industry development. To improve business planning and management, a comprehensive training and capacity development programme has been recommended, but such a programme requires design and financing. Some of the services provided are considered excessively bureaucratic and result in un-necessary costs for industry, such as timely provisioning with duty-free fuel. These issues will require attention.

³⁰ Tonga Fisheries Sector Review, Vol 1, 2 & 3, 1998,

³² Fisheries Management Act 2002.

³³NRBT Economic Dialogue, 7-8 March 2012. Strategies from the economic dialogue on growing our economy: A collective effort.

³⁴HM decision of April 2012. The FGC is composed of the Minister and CEO of MAFFF, the Head of Fisheries and the President of the NFC. Other senior officials may participate in FGC sessions.

32. A moratorium on the harvesting of all depleted species has been discussed by the FGC. However, proposed closure of the depleted beche-de-mer fishery during the 2013-2014 breeding season met with considerable resistance from industry. The fishery is now understood to be closed indefinitely to allow stock recovery. A range of additional actions have been identified by the FGC. These include:

- a) development of a fisheries investment framework and investment policy, including a review of current investment incentives and guidelines on foreign investment
- b) expansion of the Special Management Area (SMA) network
- c) review and revision of all levies and charges that fishing businesses are obligated to pay
- d) identify and develop potential aquaculture areas and issue licenses
- e) require export proceeds to be returned to Tonga
- f) applied research on development on fisheries products, improve the quality of fisheries data and development of management plans for other potential fisheries e.g. shark, bluenose

33. The Fisheries Division Corporate Plan 2014-2017 has advanced considerably with the production of (revised) management plans for snapper, tuna and aquaculture. However, the planned regular reporting is deficient; strengthening of the human capacity in terms of recruitment and staff training is constrained by funding and resources. A range of services in the areas of statistical information, compliance and aquaculture also suffer from lack of human and financial resources.

2.2 OVERVIEW OF THE STATE OF FISHERIES

34. Tonga's fisheries production, value of production and contribution to GDP has fluctuated considerably due to boom and bust cycles driven by resource depletion, changes in the distribution of tuna, market access and prices, and environmental factors. Time series on production, export and licensing statistics are not readily available and statistical information tends to be incomplete and at times inconsistent. Total estimated³⁴ catch is 6,500 tons worth an estimated US\$17.5 million, of which demersal fish comprise over 5,000 tons (80%), pelagic fish 650 tons (10%), and invertebrates 600 tons (9%). Exports in FY2012-2013 were 1,290 tons worth an estimated US\$2.2 million, of which tuna accounted for over 80% of the value. About 35% of the production is for home consumption or shared at community level and although counted in GDP estimates, is not necessarily recorded in production statistics. However, the quantities marketed can vary considerably with up to 95% being sold in areas with low population³⁵. Further details of production and export are provided in the annex. Where quantitative field surveys have been undertaken on particular species (e.g., giant clams, lobsters, beche-de-mer, mullet, turtles) and subsequently repeated years later, substantial declines in abundance are evident:

- a) a few commercial fisheries have virtually collapsed: beche-de-mer, mullet, while some species are close to extinction: coconut crabs, devil clam
- b) as inshore finfish become more scarce for the Tongatapu market, fishing effort has ranged further afield. Tu'imatamoana records show a tripling of the amount of fish originating from Ha'apai between 1994 and 1995.
- c) unlike the situation in other Pacific Island countries, coastal communities in Tonga have no preferential access to adjacent resources. This open-access situation may have worked reasonably well in the era of subsistence fisheries, but more recently has collided with commercial pressures and the carrying capacity of inshore resources.

35. Fisheries management plans have been developed for the most important fisheries and indicate targets and sustainable use limits for the fisheries. Many of the plans require additional work to detail the implementation modalities, including costs, financing, timetable and milestones. Many lack an economic development dimension and the fisheries often evolve independent of these plans. This is partly because of changes in markets and fishing patterns, poor compliance and an aspirational rather than sequential 'roadmap' nature of many of the plans, which rarely include an estimate of implementation costs. Nevertheless, the plans form an important cornerstone for development of a TFSP. The challenge will be to include measurable targets in the plans and define and finance the means to achieve the targets, monitor progress and adapt to change. The plans can be considered under three broad headings: the community and inshore fisheries; the commercial fisheries; and aquaculture. The following management plans exist and are examined in subsequent section:

- a) Aquarium Management Plan (approved)
- b) Seaweed Management Plan 2012-2013 (approved)
- c) Tonga National Tuna Fisheries Management and Development Plan - 2012 – 2015 (approved)
- d) National Plan of Action Shark Plan

³⁴ Values for 2007 from Gillett 2009.

³⁵ Kronen, 2004.

- e) Deepwater Management Plan for Tonga 2014 – 2016 (revised)
- f) Tonga National Sea Cucumber Fishery Management And Development Plan
- g) Tonga Aquaculture Plan

2.3 THE COMMUNITY AND INSHORE FISHERIES

36. Tonga's fishing population is about 13,000³⁶, of which about 50% live in the Tongatapu group³⁷ and the vast majority are engaged in the inshore fisheries, which are vital to local food security and the sustainability of many coastal communities. About³⁸ 10% of the population engage in fishing activities of which about 66% engage in fishing for sale. About 55% of the fishing population are concentrated in four constituencies: Tongatapu 4 and 10; Ha'apai 13 and Vava'u 14. A wide range of harvested species support subsistence livelihoods and small-scale commercial fisheries. Almost the entire catch is harvested from the reefs and lagoons with only minor quantities of coastal pelagics harvested. These fisheries are heavily exploited and many are depleted with declines in fish density, biodiversity and size³⁹. Finfish catches are dominated by herbivores (parrotfishes, rabbitfish (*Siganids*) and surgeonfish indicating depletion of predators. Overfishing is the principal cause of depletion, though destructive practices (such as sand/ coral mining, mangrove cutting) and pollution also contributes to habitat degradation, leading to the decline in catch rates and catches.

37. The GoT has acknowledged the difficulty of managing these dispersed multi-species fisheries through 'top-down' regulation and enforcement. There is no effective register of fishing vessels, or recent surveys of fishers and fishing gears, so baseline information is drawn from census and HIES. The Special Management Area (SMA) instrument has been designed to engage communities in a co-management process, based on the community's self-interest, incentives to sustainably manage their resources, and the recognition that community engagement is essential to effective management of these fisheries. Communities request the establishment of an SMA and after the necessary mapping, survey and consultations, ministerial approval is given and the community establishes its SMA management committee to implement an agreed SMA plan. Nine SMA are operational, 2 are in preparation and more than 20 communities have expressed their interest to establish SMA.

38. While the community approach and the SMA plans are based on sound principles⁴⁰, preliminary analyses⁴¹ suggest that the measures taken under the SMA plans are insufficient to prevent further deterioration of the community's fisheries resources. Overfishing is prevalent within SMAs on all species groups: finfish, invertebrates and particularly with regard to high value sessile invertebrates such as beche-de-mer and giant clams (two species already depleted). In some cases the SMA 'fishing rules' are simply inadequate for rebuilding fish stocks as communities market increasing proportions of their catches to generate cash income. In other cases, the SMA's ability to control illegal fishing both by community members or outsiders is weak and need strengthening.

39. Three types of harvesting can be distinguished: (i) subsistence harvesting for direct consumption in the community; (ii) semi-subsistence which is for home consumption and occasional selling of excess and includes exchange, donation and gifting - fish harvested for relatives living outside the community, e.g. sent to Nuku'alofa; and (iii) commercial harvesting for local sale, for shipment to Nuku'alofa⁴², or for export in the case of beche-de-mer and other export commodities.

40. Given the relatively small size of the SMAs and the subsistence requirements of the communities, the SMA's appear capable of stabilising and sustaining the subsistence harvests. However, the SMA communities generally have no limits on the commercial harvests and gifting which leads to overfishing and resource

³⁶ Ha'apai 16% and Vava'u 34%.

³⁷ Tongan Seafood Socio Economic Survey 2005.

³⁸ [Census 2011, Table G57](#)

³⁹ Consistent conclusions from various SPC and other reports and surveys, e.g.: Weber, 2013; Freidman, 2009; Gillett et al. 1998.

⁴⁰ Historically, traditional marine tenure in Tonga has been relatively weak and substantially different from other island countries and while customary practices need to be taken into account, they are not considered to offer a robust framework to address current resource management issues. For additional information see, e.g.: Malm, T. 2001. The tragedy of the commoners: The decline of the customary marine tenure system of Tonga. SPC Traditional Marine Resource Management and Knowledge Information Bulletin #13 – December 2001.

⁴¹ Webster, F. 2013. Analysis of Special Management Area (SMA) community data. Department of Fisheries, Community Management Section. October 2013; SPC, 2015. A new song for coastal fisheries: Pathways to change. SPC Heads of Fisheries Meeting 2015.

⁴² There is a net flow of fish to Tongatapu from the other island groups. However, in bad weather this trade may temporarily reverse.

depletion. Even where harvests are restricted under the fisheries regulations (e.g. minimum sizes), these controls are difficult to enforce. Nevertheless, the SMAs provide a sound foundation for building an effective community co-management regime. The SMA network would ideally be extended to cover most of the coastal communities, become fully integrated with and complementary to the marine parks network and facilitate implementation of management plans for the inshore commercial fisheries.

41. In order to make the inshore community fisheries sustainable, the SMA regime will require several improvements⁴³:

- a) introduction by the community of limits on community harvests, either by limiting effort or the amount of fish harvested, and through effective compliance with the community rules
- b) capacity building through leadership and business development training, through raised awareness of sustainable practises and related climate change resilience challenges
- c) devolution of greater authority to the SMA committees
- d) institutional mechanisms to foster cooperative arrangements between communities.

42. An enhanced SMA network in isolation is unlikely to be sufficient to ensure the sustainability of the inshore fisheries as the pressure from commercial fisheries will need to be reduced. In addition to a more effective regulatory framework for the main commercial resources (e.g. beche-de-mer), alternative fisheries and non-fisheries economic opportunities will need to be developed, for example through: tourism, aquaculture, handicrafts, agriculture, or offshore fishing for non-reef resources. Creation of these more resilient fishing communities will require partnerships in the areas of microfinance, small business development, and arrangements for use of community fishing grounds as dive sites or aquaculture zones. However, the design of community management regimes must take account of the nature of incentives at community level⁴⁴. A Tongan small-scale fisher does not necessarily associate fishing with individual gain, but as a means of fulfilling obligations, subsistence requirements and occasional cash needs. Distinguishing between subsistence and commercial fishing may prove difficult as fish may enter the market as a response to cash needs rather than market demand. Thus community self-regulation may be short-term, responding to immediate social pressures and may not consider medium- to long-term investment in a sustainable fishery resource. In some areas up to 95% of the catch from the coastal fishery may be sold and it can be the an essential source of cash revenues⁴⁵.

43. Specific attention can be directed to several inshore fisheries which are not as yet the subject of management plans. These include: the fish fences and their impact on reef fisheries; the octopus fishery, the shellfish gleaning (hand collection on reef top, mostly by women) for cockles, *Anadara* ("kaloa'a" in Tongan) and related shellfish; the development of best community practices for 'clam gardens', and sustainable financing of community FADs. Giant clam, octopus and cockles form a significant part of the subsistence diet and are of particular importance for women fishers, for example, in some areas women account for over 75% of invertebrate harvests.

44. Planning for sustainable coastal and inshore fisheries will also benefit from a frame survey to more accurately determine the numbers of fishers and vessels (many may not be registered) and their catches, as the current creel surveys, licensing and SMA records do not fully capture the scale of these fishing activities, the employment generated and the social dimensions of the fisheries economy.

45. Community development consultations⁴⁶ in the more remote areas indicate a consistent pattern of community and fisheries requirements. Even in outer island communities heavily dependent on fisheries, the priority requirements may not be directly related to fisheries. Many priorities are for social infrastructure: such as repair or upgrading of community halls and schools, sanitary facilities, street lighting, water and response to health emergencies. The need for improved/ safer harbour access and landing facilities (jetty/ wharf) and lifeboats is frequently expressed. Priority concerns related to production include village pig fencing, access to markets, and availability of fishing gear, seeds and agricultural tools. Experiences from the TRIP project and elsewhere suggest that linking the development and operation of SMAs to community priorities is more likely to

⁴³ There is an extensive literature on co-management arrangements in small-sale fisheries and SPC has significant experience in this area. Information sources include: FAO 2014; FAO, 2013; FAO, 2012(a); Davis, A. and K. Ruddle, 2012 (cautionary); Mühlig-Hofmann, A. 2007 (Fiji).

⁴⁴ Kronen, M. 2004. Fishing for fortunes? A socio-economic assessment of Tonga's artisanal fisheries. Fisheries Research 70 (2004) 121–134 (citing also: Halapua, S., 1982. Fishermen of Tonga- Their Means of Survival. Inst. of Pacific Studies and Inst. of Marine Resources, University of the South Pacific. 92 p.)

⁴⁵ Kronen 2004 (b); Kronen and Malimali 2009.

⁴⁶ Based on wide-ranging community planning and consultation exercises undertaken by the IFAD/ TRIP project managed by MORDI, e.g. Hunga, 'Ovaka, Lape, Nuapapu, Matamaku and many other community development plans.

progress the SMA agenda. The TRIP project also shows that some communities are more actively engaged in planning and community development and have more experience of project engagement (see TASP for details). These communities with a higher state of ‘preparedness’ could be considered more viable targets for SMAs if fisheries are a high priority for the community.

46. Establishment of SMAs to date focuses only on isolated single village community’s. It has not been trialed on multiple-village community’s that are adjacent to one another with a range of multi-resource users. The current SMA model and approach will require adjustments to accommodate such situation. The main principles of fisheries resource management will remain the same with further additional strategies to accommodate larger communities, including inland villages that have traditionally fished in the coastal areas for food, with the occasional selling in the local markets to meet other obligations. These type of communities are mainly located on the main island of each island group in Tonga, where most of the fishermen are concentrated, with the highest impact on the coastal resources. There is an urgent need to expand such co-management systems, as the SMAs, with the appropriate adjustment to tackle the issue of sustainability and conservation in places where most of the problems occurs.

2.4 THE COMMERCIAL FISHERIES

47. The commercial fisheries include the local market food fisheries and a range of export fisheries for: tuna, snapper, beche-de-mer, ornamentals (including fish, coral, live rock and baby clams), seaweed, pearls and precious shell (*Trochus* and green snail).

2.4.1 Tuna

48. The tuna fisheries can be considered as two separate fisheries involving at least two distinct value chains.

- a) the locally-based (large-scale) longline fishery with a possible expansion of a local small-scale fish aggregating device (FAD) fishery
- b) the licensed foreign long-line fishery, mainly targeting albacore
- c) the fresh tuna and billfish value chain
- d) a frozen tuna value chain.

49. Tonga’s development aim is ‘sustainable, optimum utilisation of the tuna fisheries’ through an ‘ecosystem-based, sustainable use and economically efficient tuna businesses’. This currently involves a balance between generating revenue from licenses sold to foreign vessels and developing the local harvesting and value-added processing of tuna, and import substitution using the lower value non-export part of the catch (bycatch).

50. Conservation and management of the tuna fisheries is subject to WCPFC measures and Tonga is compliant with such measures and receives support from FFA and other partners to implement the measures. Tonga’s NPOA shark also contributes to the overall management of the oceanic fisheries – there is no directed fishery for sharks in Tonga. Current catches are well within the limits determined by the best scientific advice, though the bycatch of bigeye and sharks continues to be a concern throughout the region. Tonga has set a precautionary limit (TAC) of 8,000 tons (all tunas) and a limit of 50 vessels in the management plan (the current recommendation is for 16 licenses of which a maximum of 6 are foreign). However catches have not exceeded 2,000 tons and licences peaked at 35 in 2002 indicating a relatively low demand by foreign operators.

51. The current local Tongan tuna fleet comprises three operational longline vessels operated by a single company⁴⁷ and exporting fresh tuna (mainly yellowfin) by air to Japan, Australia and New Zealand. Seasonally, the catch also includes albacore, bigeye and billfish (mainly swordfish and blue marlin). Dolphinfin (mahimahi) and shark are important bycatch species, generally sold on the local market. Some unsold fresh fish may be frozen for local sale. Little or no frozen tuna is exported, partly because suitable freezing and cold storage is lacking. Catches have fluctuated from a high point of over 1,700 tons in 2001 to about 200 tons in recent years. The export of fresh tuna is Tonga’s most valuable fish export (over US\$1 million). The profitability of the local vessels relies heavily on the export of fresh fish and the size of the fishery is limited by the cargo capacity of the airlines serving Tonga.

52. In late 2014 only six foreign-owned and based longline vessels are operated by five Asian companies with total catches rising to over 2,700 tons in 2013. These vessels mainly target albacore and generally operate from bases in Fiji and American Samoa where vessels can avail of lower fuel prices and better logistic support. Annual license revenues are in the order of US\$120,000. Although the stock is healthy, the South Pacific albacore fishery has been in decline, partly because of depletion of the large fish which are the primary target of

⁴⁷ One further licence has been issued to another Tongan vessel.

the fleet – some of which benefit from subsidies, and partly because of declining prices and demand for canned albacore. Records indicate that about 66% of the catch comes from the EEZs, but as there is a low level of PIC observer coverage (<2%), detailed information on the operation and economics of the fishery is poor. The level of interaction and competition between the local and foreign fishing operations is unclear, although both target tuna aggregations around seamounts. This interaction could be assessed by analysis of the VMS records.

53. The development plan indicates the need to increase landings and economic contributions from the foreign fleet and studies have been undertaken to identify key actions. These actions⁴⁸ include:

- a) evaluation of the comparative benefits of an access fee (no landings) and tuna landings regimes or a combination of both
- b) initiatives to improve the port and airport infrastructure for tuna handling, value-added processing and storage and to source private and other finance for such infrastructure
- c) improvement of services, including for vessel maintenance and repair
- d) improved knowledge of the catches in Tongan waters
- e) estimation of the optimum size and limits of the Tonga fresh tuna export operations
- f) survey of potential overseas markets for value-added tuna products

54. There may be opportunities to export frozen value-added tuna products of local tuna or of landings by the foreign licensed fleet. However, the handling and processing capacity and particularly the blast freezing capacity in Nuku'alofa is limited and substantial investment would be required to develop such products (see infrastructure below). Such investments will need to be market driven and a business case based on trial processing and marketing prepared. Niche markets can also be tested, for example by ecolabelling Tonga tuna, developing smoked products, or contracts with supermarkets in Sydney and Auckland for frozen steaks. The coastal and inshore fisheries do not currently harvest significant quantities of tuna and related pelagic species, suggesting that increased deployment of FADs may increase these catches. However, lessons⁴⁹ learned from previous deployment of FADs in Tonga and elsewhere will need to be applied. Increased tuna landings can help import substitution, but the local market is limited and price sensitive, e.g. the price of fish is generally higher than the price of chicken and imported canned fish may have a significant convenience value for urban consumers⁵⁰. Despite the potential economic benefits, caution is required in implementing the current recommendation to oblige foreign licensed vessels to land all their catches in Tonga. Without clear arrangements for handling and export of the landings or transshipments, this could result in loss of license revenues or falsification of catch reports in the absence of effective observer coverage.

55. In summary, several activities are important for the development and management of the tuna fisheries. Tonga will need continued participation in regional fora on tuna management, but bearing in mind the time commitment of senior officials and the cost/benefits of this participation relative to other priorities. Human resources from other ministries (finance, law, NTRB) could also be used to reinforce Tonga's international tuna engagements. In order to increase the value of the tuna resources to Tonga, it is important to commit to a regional approach to limiting access and linking the activities of the South Pacific tuna longline fishery to the local economies. This can potentially increase rents, value added and economic engagement in the fishery. Ideally, the 'southern' FFA members could develop cooperative licensing arrangements for the longline fishery similar to those established by the PNA for the purse seine fishery. Knowledge of the profitability and potential rent⁵¹ from the fishery is limited and is required to develop a coherent infrastructure development business plan.

2.4.2 Deepwater snapper

56. The deepwater snapper fishery operates on Tonga's continental slopes and seamounts, harvesting about 14 snapper and grouper species and some jacks. Historical catches exceeded 400 tons/year at the outset of the fishery and declined to a low point of 88 tons in 1996. Current catches have remained relatively stable at an average of 190 tons/year with a fleet of 14-25 vessels from 2000, of which some were relatively inactive. Numerous studies have been done on the fishery and the management plan has been revised and updated for 2014-2016. The revised management plan adds a profitability objective to the range of sustainable use objectives. The precautionary maximum sustainable yield (MSY) is judged to be 250 tons/year. However, as the fishery has undergone boom and bust cycles the key indicator is the maximum economic yield (MEY) and the

⁴⁸ Key outcomes of discussion stakeholders consultation on the tuna plan review & bio-economic modelling. Internal report MAFFF, May 2014.

⁴⁹ Where FADs are publicly owned maintenance is a problem. Where FADs are privately owned, 'poaching' can be a problem. Community FADs may suffer from both problems.

⁵⁰ Kronen, M. 2004. Tonga County Report. Draft Socioeconomic Component. SPC. 2004.

⁵¹ Grafton R. Q. and T. Kompas, 2009. Tuna Wealth Study: Assessment of the Value of the Tuna Resources in the Western and Central Pacific Draft report. The World Bank, PROFISH, 2009.

number of vessels which can profitably fish. While additional bioeconomic studies (cost and earnings/ catch value) are required, based on previous studies⁵² an MEY is in the order of 200 tons with a fleet of 7-16 vessels appears reasonable. However, there is considerable latent capacity as some of the aging fleet do few trips and current efforts to rehabilitate the fleet with concessionary loans may increase fishing effort and undermine the economic performance and stability of the fishery. The current plan states that the total length of vessels licensed for snapper and grouper fisheries must not be more than 23 meters. The non-exported catch is sold on the local market and some vessels fish only for the domestic market.

57. More recently, several smaller outboard-powered artisanal vessels have become operational, fishing within a 60-70-mile radius of Nukualofa generally on shallower grounds than the larger vessels. These vessels target many of the same species (though not the prime export species) and sell catches of over 1,000 kg (5-7-day trip) on the Tongatapu market. Information on the catch of these vessels is not currently included in the deepwater catch recording system maintained by the Fisheries Division.

58. As a possible management solution to introduce long-term tradable rights, one study⁵³ suggested an individual transferable quota (ITQ) scheme. Such a scheme could work as follows: (i) fishing rights for a 20 year period (in terms of a quota of tons of fish, or percentage of the MEY) would be granted to existing licence holders based on their 'track record' of catches (catch history); (ii) no operator would be authorised to fish without a quota; (iii) owners would be able to sell or pool their quota - this would compensate the less profitable operators for exiting the fishery or have the most efficient vessels use the quota. A similar scheme could also be designed based on effort (individual quotas of fishing days, or days at sea). Either system would be enforceable as the vessels operate from only two ports and a high proportion of the catch is exported. What is clear is that public policy cannot on one hand try to set limits on catches, or licenses and on the other hand subsidise an increase in fishing capacity.

59. Management requires close tracking of the fisheries' economic performance and associated effort control. Ideally, quarterly cost and earnings information needs to be collected and analysed and an MEY estimate refined in relation to current costs and earnings. Particular attention needs to be given to the economic performance of the vessels supported under the recent soft loan arrangements. The current catch recording system is a valuable management tool and could be enhanced if GPS tracking of the fleet using low-cost (non-satellite) devices was introduced, as the use of satellite vessel monitoring systems (VMS) has proved costly and difficult to maintain. Care must be taken in interpreting catch information as an increasing average size of fish may reflect the market requirements, rather than the state of the stocks. The species and size composition of the exports should also be tracked and integrated into the monitoring regime. In addition to an expansion of the current catch monitoring to the smaller vessels, a focus on the tracking of the economic performance is strongly urged. This can be aligned with any loans and/ or grants provided in support of the fishery.

60. As in the case of tuna, the logistics and profitability of the snapper export operations are also dependent on the limited air freight capacity (mainly to Hawaii and Los Angeles). A planned reconfiguration⁵⁴ of the Air New Zealand fleet could have a significant impact on tourism and on these fisheries. As in the case of tuna, export of frozen value added products will require investment in cold chain infrastructure and trial marketing. The direct delivery of fresh fish caught north of Vava'u to Pago Pago can also be explored. In summary, the existing snapper management plan should be effectively implemented, economic performance target(s) specified and means to apply them put in place.

61. In summary, poor, or non-implementation of management recommendations have characterised the fishery, indicating that a lack of political willingness has undermined good governance. The fishery can generate significant rents and foreign exchange, but only if strict limits are placed on fishing capacity based on a precautionary catch limit (MEY) derived from sound bioeconomic analysis. Latent capacity needs to be eliminated to avoid political pressure for superfluous licenses. Capacity can be reduced through a form of tradable rights; and investment in ecolabelling, improved handling facilities, and possibly in value-added marketing can be supported. As a substantial part of the fishery's economic drivers (e.g. fuel costs and export market prices) are beyond Tonga's control, a management regime with a built-in response to economic pressures (such as individual transferable effort) is likely to be the most efficient and manageable regime.

62. There is broad support among the deepwater snapper operators for a strict limit on the number of vessels, for effective vessel tracking, for possible rotation of fishing grounds (closures to rebuild stocks)

⁵² Williams and Nicol, 2013; Staples, 2013.

⁵³ Staples, 2013.

⁵⁴ There is a 100-seat difference between the planned 777 aircraft and the A320, one of which will substitute the 767 which is to be phased out.

contingent on effective monitoring of the vessels, and for inclusion of the artisanal vessels in any management scheme.

63. Stakeholders in the tuna and deepwater export fisheries share common concerns with respect to infrastructure and finance (see section 2.7.2). In particular, there is a demand for improved infrastructure in both Tongatapu and Neiafu (ice cold, storage, fish handling/ processing area and airport cold room facilities); concessional finance for vessels and for working capital for bait import and export; improved airport fish handling facilities and assistance in development of markets.

2.4.3 Beche-de-mer

64. The beche-de-mer (mokohunu) fishery is substantially overexploited due to repeated non-adherence to management recommendations, weak compliance control over the long-term, and more recent prolongation of the open fishing season despite a reduction in catch and catch value⁵⁵ to less than a fifth of previous levels (see annex)⁵⁶. Production rose to over 300 tons in 2009 and 2010 - several times the long-term average. In 2012, the fishery was closed for at least 3 years (2012 – 2014). However, due to political pressures, the fishery was reopened in June 2012 – before collapsing in 2014. In addition to the political pressures to open the fishery, the processing licenses are an important source of revenue for the fisheries administration. It is clear that the fishery requires a renewed moratorium of several years⁵⁷. Once there are clear signs of recovery⁵⁸, a substantially lower export cap is required and during the moratorium a more robust management regime needs to be designed (see below). Studies indicate that Tonga could have sustainable exports of more than US\$0.5 million from the fishery and even greater returns if higher product quality standards and value-added marketing could be developed.

65. A similar pattern of failed management is prevalent throughout the PICs. The reasons are similar: powerful commercial drivers of over-exploitation and related corruption and conflicts of interest, enforcement failures coupled with the wide dispersion of small-scale production, weak quality control and export pricing issues. Based on experience in other PICs, Tonga's proposed management plan, which is based on conventional measures (limited harvest and processing licenses, closed seasons, moratoria, size restrictions, gear restrictions) is unlikely to be effective. A radically different approach⁵⁹ should be considered to create stakeholder incentives for sustainable use, effectively enforce harvesting rules, establish processing standards, remove all traces of organised illegal fishing, and improve trading returns:

- a) create a monopoly for the harvesting, processing and export of beche-de-mer.
- b) the monopoly would be owned by a cooperative with three groups, or divisions, one for each island group⁶⁰. The only members of each cooperative group would be accredited harvesters – divers or gleaners who would share in any profits from the sale of beche-de-mer.
- c) the cooperatives would manage the licenses and the harvest, or effort limits in accordance with criteria to be developed for each island group, or fishing ground.
- d) all exports, including for personal consumption would be traded by the monopoly to ensure effective control of all exports and full product traceability
- e) trading returns would be improved in several ways: by creating product standards; by direct negotiation of bulk sales with Asian buyers; and by developing value-added products in association with reputable Asian buyers

⁵⁵ Note that this value is maintained as a result of rising prices on the Chinese market although the exports are likely to comprise increasing proportions of lower-value species.

⁵⁶ Kalo M. Pakoa, Poasi V. Ngaluafefe, Talaofa Lotoahea, Sione V. Matoto and Ian Bertram. The status of Tonga's sea cucumber fishery, including an update on Vava'u and Tongatapu: November 2013. Secretariat of the Pacific Community; Carleton C., Hambrey J., Govan H., Medley P. and Kinch J. 2013. Effective management of sea cucumber fisheries and the beche-de-mer trade in Melanesia. SPC Fisheries Newsletter 140:24–42.

⁵⁷ There are more than 10 commercial species in the fishery and some of the most valuable (such as black teatfish) take 10 years to reach maturity, so stock recovery can be protracted.

⁵⁸ A 'Pacific species density reference point' system provides a useful metric. Some of Tonga's densities are orders of magnitude below the reference density.

⁵⁹ Basically, none of the conventional systems have worked for management of beche-de-mer in the Pacific, or elsewhere. The proposed system has precedents. Most Japanese coastal fisheries have a similar cooperative/monopoly approach. Numerous examples exist in Canada, France and Spain and Mexico. In USA they have been contested using anti-trust legislation. The approach has some similarities to the New Zealand Maori fishing rights system.

⁶⁰ Haa'pai has about 90% of Tonga's beche-de-mer habitat.

- f) the possibility of developing a combined marketing approach with other PICs⁶¹, including on ‘certification’ of buyers and engagement with the TRAFFIC network and other NGOs to trace and halt trade in illicit products in Asian markets would be actively pursued
- g) the monopoly could also invest returns in seed production and distribution – ranching of sea cucumber in association with communities.

66. The key to the recovery is the creation of a strict export monopoly combined with high penalties for illegal exports, such as loss of all business licenses, tax avoidance investigation, freezing of assets. A key objective is to eliminate the high profits made by middlemen and exporters and transfer these benefits to fishers and coastal communities. The export monopoly should extend to all exports including gifts to the Tonga diaspora, i.e. the monopoly would physically handle all such exports, as otherwise these exports will be open to abuse and impossible to control. While the proposed monopoly could sell some product through auction, in order to establish guaranteed minimum prices to fishers, advance contract sales of specified quantities and qualities of products will facilitate planning and cash flow.

67. There are a number of challenging issues for operation of a monopoly regime established as a product collection, processing, quality control and exporting company owned by the harvesters all of which would require study and extensive consultations with harvesters and sellers to develop practical solutions:

- a) identification of the ‘legitimate’ beche-de-mer fishers to whom shares would be allocated
- b) the role of communities and SMAs in resource tenure, shareholding and control of fishing
- c) determination of allowable catches by area and or groups of fishers/ rights holders
- d) responsibility for and operation of quality control at the village/ harvest level
- e) modalities for product collection and payment
- f) rules on harvesting of beche-de-mer for internal (home) consumption⁶² and local sale
- g) means of countering resistance to a monopoly by existing exporters
- h) detection of illegal exports⁶³.

2.4.4 Seaweed

68. The production and sustainable use of *Limu* seaweed appears dependent on sea temperatures and the scale of Japanese/ Okinowan production. The risks and viability of the industry require further evaluation to prepare a realistic development strategy.

69. The production of other seaweed (such as *cottoni*) offers alternative livelihoods, but production is often prone to disease and predators. Markets are volatile and Tonga has limited competitive advantage in relation to major producers such as Indonesia and the Philippines. Production of niche seaweed products for markets in Australia and New Zealand can be further explored. Measures to reduce risk and stabilise *Limu* production and improve market access can be supported as part of the development of alternative economic opportunities and resilience.

2.4.5 Ornamental, shell and other fisheries

70. Aquarium fishery had significantly contributed to export earnings from Fisheries in past years. Two products that contributed significantly to foreign earnings in this fishery were farmed giant clam and live rock. Live rock in this trade is the dead rocks that are encrusted by various algae, sea worms and other organisms in the sea bottom which resemble a small ecosystem. Nevertheless, aquarium fishery and the related activities are mostly viewed negative by many people and considered to pose threats to the reef ecosystems and their effective management is challenging. Renewed trade in live coral is unlikely unless coupled with coral seeding and culture. The live rock trade is also faced with conservation concerns and difficulties in control. The trade in ornamental fish faces stiff competition from Indonesia and Asian countries and cannot compete at current price levels. Sustainable harvesting of *Trochus*, green snail, mother of pearl and other shells can form the base for artisanal tourist products and can also be the object of extensive culture and ‘ranching’ in SMAs. Larger-scale production of other products (such as buttons and jewellery for export) would require private investment and market development, possibly as part of the development of alternative economic opportunities for communities. Support for the development of any of these fisheries needs to be based on a sound business case coupled with effective monitoring of sustainability. For example, studies indicate that a sustainable live rock

⁶¹ Pacific Bêche-de-mer and the Future of Coastal Fisheries Meeting 2014.

⁶² Only some species are consumed locally.

⁶³ For example, sniffer dogs (Labradors) have been successfully used in Ecuador/ Galapagos to detect illegal trade in sea cucumber.

fishery may be possible, but the business case needs to include the long-term costs of monitoring and control and the cost to the reef ecosystem.

71. A number of other fisheries require specific attention. These include the fish fence fishery, the gleaning activities (with specific reference to Tongatapu in both cases), the octopus and lobster fisheries and the fishery for ark shells and cockles (*Anadara* and related species). Basic management plans including their operational integration with the community fisheries regime(s) can be programmed.

2.5 AQUACULTURE

72. The existing aquaculture development plan (2010)⁶⁴ is a comprehensive document covering the legislative framework and key commodities. Stakeholder consultations during the preparation of the plan prioritised sea cucumber, coral and live-rock, mozuku seaweed, mabe pearl, *Trochus*, *Kappaphycus* seaweed, marine finfish and giant clam. Aquaculture production has been low, characterised by difficulties in brining production to scale, climatic stresses, natural disasters and a challenging business environment. Mozuku (*Cladosiphon* sp.) is the most important commodity: about 300-500 tons are exported to Japan depending on seasonal demand. Spores are cultured to supplement the wild harvest. Much of the public investment has focused on an extended research phase and where there is significant commercial potential, extension has tended to focus on small-scale production which often lacks the necessary financial, technical and marketing attributes. There needs to be recognition that substantial aquaculture development is unlikely without significant and protracted investment at commercial scale. The uptake of government initiated pilot schemes by private investors has generally had limited success. Rather, government needs to partner with private investors who have the capital and technical and market expertise. Aquaculture may also serve as a means of stock enhancement and stock rebuilding, particularly in the case of giant clams, *Trochus*, sea cucumber and other sedentary species. This could be done both through village ‘nurseries’ and government seed production.

73. Bringing aquaculture to scale in Tonga’s physical and business environment requires at least three inputs: (i) substantial long-term investment capital; (ii) technical and commercial competence; and (iii) export market access, as the prioritised commodities are for export. While some of these inputs can be provided through development assistance, a critical mass of commercial aquaculture is unlikely to be achieved without some external investment to provide the capital, technical expertise and market access. Ideally investments would combine external capital, expertise and market access with local investment backed by government assistance to an infant industry. The existing development plan tends to focus on the regulatory environment with insufficient attention to incentives for the required commercial investment. It is suggested that a specific investment strategy be prepared to foster foreign investment in aquaculture, with particular reference to development of ‘outgrower aquaculture’ involving a corporate ‘nucleus’ developer with contracted smallholder producers. This may involve a favourable tax regime, a “one-stop-shop” development approval process, infrastructure support (e.g. power supply connection, road access, land and water leases) and a framework for integration with communities and smallholder production in lagoons, or bays. Aquaculture development will ideally be set within a coastal zone spatial planning framework where the roles and authorities of the various stakeholders are clearly demarcated to avoid bureaucratic overlaps and conflicts.

74. Fanga’uta Lagoon is a particularly interesting aquaculture site with high potential for mollusc aquaculture. However, deteriorating water quality due to pollution and siltation has rendered much of the lagoon unusable for aquaculture and caused loss of seagrass and mangrove habitats. Integration of aquaculture (particularly bivalve filter feeders) into the new lagoon rehabilitation project could contribute to restoring the ecosystem while providing the environmental monitoring required.

2.6 FISHERIES INFRASTRUCTURE AND MARKETS

75. Key productive infrastructure includes the main fisheries wharf at Tu’imatamoana in Nukualofa (see figure in annex), the wharf, workshop and processing room at Neiafu (Vava’u), the workshop at Pangai (Ha’apai) and the Ministry of Fisheries aquaculture tanks at Sopa (Nuku’alofa) - all of which are under government ownership. The markets at Neiafu and Tu’imatamoana are under the operational control of the NFC, while the ice machine at Neiafu has been donated by a private entrepreneur. The Neiafu facilities are in good repair, but it is unclear if user charges can support the recurrent costs. The Pangai facilities suffered major typhoon damage and rehabilitation is understood to be funded by the UN.

76. A master-plan needs to be developed for the main fisheries wharf and landing facilities in Nuku’alofa. The land from the existing open fish market to the slipway at the east end of the basin is owned/ occupied/ or

⁶⁴ Ministry of Fisheries/ SPC, 2010. Tonga. Aquaculture Commodity Development Plan. 2010-2014. Secretariat of the Pacific Community. Noumea, New Caledonia, 2010.

controlled by several different entities: the Tonga Ports Authority, the NFC, and a private company leasing the premises of a defunct fishing company from the Ministry of Public Enterprise. Several derelict vessels occupy some of the wharf space and moorings and important slipway and (defunct) machine workshops occupy the eastern side of the basin. The north mole of the basin can also be developed as a wharf giving access to unoccupied land on the cargo port side of the basin. Additional deepwater berths on the outside of the basin could be developed for larger tuna vessels. There is a significant lack of freezer storage in the area. Sanitary conditions at the existing open-air fish market can benefit from improvement as part of the master plan. Any public investment in the infrastructure will need to be accompanied by corresponding commercial engagement in processing and cold storage and development of a user charges or tariff regime, which on one hand at least covers the recurrent costs of the facilities and on the other hand allows the industry to develop.

77. There are currently no cold storage facilities at the airport resulting in loss of fresh fish quality. An infrastructure master plan could also address the need for private sector financing for development of fish handling and processing facilities and cold storage in this area. In the short-term, the National Fisheries Council (NFC), through joint action by the exporters, could consider accessing the concessional loan facility (see below) to install one or more plug-in freezer containers or a small cold room designed for ease of loading/ unloading of the fresh fish air freight pallets. A consultative process between airlines and prime users of cargo and passenger space could also underpin cost-effective use of the cargo capacity.

78. The MoF has administrative offices in Sopu, Neiafu and Pangai and some staff accommodation in Pangai (damaged). The Sopu offices require substantial structural repair and upgrading, including improved security for the servers and other key assets and review of the state of and future requirements for aquaculture facilities. Any investments could be linked to an assessment of the long-term needs for office, workshop, laboratory, biosecurity and other requirements, and a commitment to ensure recurrent funding for maintenance. A permanent aquaculture development and extension presence in Vava'u could also be considered. In order to retain qualified staff, consideration could also be given to construction of staff housing. In addition, the Ministry's vessels require maintenance and upgrading, particularly with regard to safety (spare engine, life raft, life jackets, radio if possible, and other equipment) and installation of dry storage on board for sensitive equipment (phones, computers, cameras, projectors).

2.7 FISHERIES GOVERNANCE ARRANGEMENTS

79. Fisheries governance has been largely unsuccessful in achieving sustainable capture fisheries, or significant and sustainable growth in aquaculture production. Numerous studies and reports have made sensible and realistic recommendations on management measures. The failure to effectively implement these measures has been attributed to several factors: (i) lack of political will; (ii) technical and management weakness of the fisheries administration; (iii) lack of functional incentive arrangements associated with the management measures – this can be partly attributable to the open access nature of the inshore resources; and (iv) scarcity of human resources and funds. Other external factors have also affected the fisheries, including: variability in the distribution of tuna concentrations, changes in market prices and market access, natural variability in productivity, and the inability of the business models to adapt to change.

80. This strongly suggests that fisheries management approaches need to be more effectively grounded in political commitment, even if this incurs a political cost. The design of the management regimes will need to include provisions for effective incentives to comply with management measures and for cost-effective and functional disincentives for non-compliance: either through social pressures, or regulatory actions. For example, if a berried lobster is found anywhere (on a vessel, in the market, a vehicle, or hotels), this would trigger an automatic one month moratorium on all lobster fishing. This would substantially raise the incentives for all fishers to comply with lobster regulations and reinforce social pressures to comply. Thirdly, the fisheries administration will require considerable and measurable improvement in performance and service delivery. Lastly, stakeholder engagement is fundamental in brokering the political solutions, for building the underlying social consensus, for design of acceptable management measures, to monitor the state of the fisheries and to adapt to a fisheries economy in constant change.

81. Compliance is a major challenge in some fisheries, such as beche-de-mer, and one option to address the management arrangements has been outlined above. Some deficiencies in the legislation have been flagged in some studies. Closer collaboration between ministries may also be of value (customs, police, commerce), while hotlines, rewards and exposure to the media can also be envisaged. Means of checking on remittances for exports of certain products could also be explored. Despite the legal requirement, technical constraints preclude use of Vessel Monitoring Systems on many snapper and other medium-sized vessels. Simpler systems without real-time reporting can be envisaged using GPS linked to mobile phones which download the vessel track via a text message when within cell phone range. This information can be used to monitor effort by area.

2.7.1 Fisheries Division⁶⁵ and MAFFF

82. In 2005 the fisheries administration had 99 staff, while current staff is less than 50. The fisheries administration was ‘downgraded’ to the status of a division (below department level), whereas it was previously a ministry. The amalgamation with agriculture was seen as a cost cutting measure; it was opposed by the private sector but has proved counterproductive. Many staff left through voluntary redundancy unrelated to the administration’s needs. The loss of ministerial status has led to demoralisation in the Division⁶⁶, loss of capacity and loss of sector performance. While efforts have been made to recruit qualified staff (including at masters and doctorate levels), some well-qualified senior staff may leave Tonga, creating further human resource gaps in an already overstretched Division. In addition to the staff shortages at senior professional levels, e.g. in fisheries management and community fisheries, support services, such as IT remain fragile, largely due to staff shortages⁶⁷. The accompanying administrative changes with respect to routine authorisations and financial control have resulted in significant loss of efficiency, e.g. routine paperwork that needs to be moved between the Division and MAFFF headquarters for approvals and execution. With the currently available resources, the fisheries administration cannot effectively undertake its mandate at national level and its obligations at international level. Without investment in staff and facilities, the Division will be unable to respond to the ongoing threats from overfishing and climate change. The likely consequences are a progressive erosion of fish food security and a livelihood pillar of the most vulnerable communities, greater urban migration and youth unemployment, increased reliance on imported protein supplies, an inability to restore the collapsed beche-de-mer fishery and a fragile investment climate for commercial fisheries and aquaculture. Nevertheless Division staff benefit from considerable training opportunities including through SPC, FFA and other workshops, meetings and training courses.

83. While there is a corporate plan, it does not appear to focus resources on measurable targets or clear milestones. A recent institutional strengthening report has made a number of useful suggestions which could be considered if the Division is raised to the status of a Ministry (or Department) as has been proposed (see Box 4, page 57). A key recommendation is to ‘flatten’ the organisation by creating several divisions reporting to a CEO. Careful consideration of such a reorganisation would be required and should be based on an in-depth functional review of future requirements.

84. The National Economic dialogue (March 2012) suggested that the Fisheries Division be granted greater autonomy as a Department with a CEO. Currently the Division has a Head who reports to the CEO of MAFFF. The Division is split in two sections, one dealing with corporate services and the other (Technical Section) dealing with all operational matters (fisheries management, development, research, licensing and MCS). The vast majority of the staff are located in Tongatapu with few staff on each of the Ha’apai and Vava’u groups. The Fisheries Division would benefit from an upgrading of staff skills and a modest increase in staffing. In particular, the Division would benefit from improved IT, improved monitoring, control and surveillance skills, and a reinforcement of the economic dimension of the fisheries management plans (MEY estimates, value chain analyses, support for business plans and credit operations) and policy decisions (license fees, landings obligations). Assuming that logistic and technical support can be provided, community fisheries and aquaculture in particular would benefit from relocation of some staff to the islands. In order to enhance coordination, senior staff would benefit from an allowance for text messaging.

85. The Fisheries Division’s budget is largely consumed by salaries and core operations. In 2013, remunerations accounted for 58%⁶⁸ of total expenditures (total T\$1.8 million); MCS/ enforcement was the major area of operational expenditure (18%); community development was 5% and aquaculture 12%. Extra budgetary expenditures (e.g. from development assistance, see annex, Table 5) are significant but have not been estimated as: (i) they are not included in budget estimates unless the funds are channelled through the treasury; and (ii) many funding sources are regional project where budgets are not necessarily allocated by country. The administration will need to establish a means of assessing the value of such external support. However an effort to project these expenditures has been made in the proposed budget for the TFSP (see Table 1 and Table 23)

86. The 2013 expenditures included operating expenditure for the Tu’imatamoana market (9% of expenditures) and substantial expenditures for 2014, including for overseas travel and electricity. The maintenance budget is deficient as evidenced by the degradation of the main offices. The Fisheries Division

⁶⁵ The Department of Fisheries was reinstated to Ministerial level in July 2015.

⁶⁶ Robert Ferraris 2008. Review of Institutional Reform and Institutional Strengthening in Pacific Fisheries: Experiences and Lessons Learned. Final Report. Forum Fisheries Agency/ GEF Oceanic Fisheries Management Project.

⁶⁷ Key software and its maintenance (e.g. statistical packages and VMS) are provided through SPC and FFA.

⁶⁸ Information provided by the Fisheries Division. Remunerations were 62% in 2014.

assets on Ha'apai (workshop, staff housing), damaged in the cyclone are to be repaired or replaced. The EU-financed assets in Vava'u (market, quay, workshops and slip) are under FMC or private management. Fisheries vessels in both island groups need upgrading, including attention to safety, communications and poor weather conditions.

87. Thirteen (13) development projects with a fisheries sector component and a total value of US\$2.73 million⁶⁹ have been financed (see annex for details). The most important include the ADB-financed Climate Resilience project, under which six SMAs would be established in Vava'u; aquaculture projects for milkfish and pearls; government support for fisheries development with funds provided through the Tonga Development Bank; and GEF funding for SMA establishment. Research appears to be largely crisis driven (e.g. coral harvesting and beche-de-mer surveys), or driven by available regional or donor funding. Industry input to an applied research agenda would be of benefit, i.e. to answer specific questions to enable more effective industry decisions and planning.

88. In summary, almost the entire Fisheries Division allocation of public funding is used for recurrent expenditure (salaries, operations, maintenance). There are no significant allocations for investment which is funded almost entirely from development assistance. During implementation of the TFSP, the administration will need to track these external inputs in an effort to build a stable funding pipeline aligned with the TFSP priorities.

89. There are few 'formal' arrangements or joint plans between MAFFF and other government entities, for example: with the Navy on mission planning and cost sharing; with the entities responsible for tourism and environment, for example, on development of marine parks, management of SMA dive sites, development of other marine leisure activities and broad engagement with church leaders on marine conservation issues. Substantial synergies can be developed in many of these areas.

2.7.2 Support to the private sector

90. The National Economic Dialogue (March 2012) identified a range of initiatives to support the private sector in general and specific fisheries initiatives. Several have been implemented: enhanced dialogue with industry (see below); removal of customs tariffs in imported factors of production; review of levies; outsourcing of services (such as management of market facilities in Tongatapu and Vava'u by the NFC). Others, such as development of business training programmes and mentoring; measures to combat illegal fishing; and removal of some bureaucratic constraints have not received sufficient attention. The government has provided concessional loan funds for rehabilitation of vessels and other investments. The reimbursement status of previous financing disbursed directly by MAFFF is unclear and it is understood that weak performance has led to the channelling of additional support through the Tonga Development Bank (TDB). An additional T\$300,000 (1% currently over 9 months, but repayment period is to be extended) is also understood to have been made available by the government through the TDB, but has not been disbursed. A further T\$750,000 is also understood to have been approved. Potential borrowers have difficulty in accessing the funds for several reasons: (i) inability to meet security requirements; (ii) weak business plans and lack of evidence of a successful business history; and (iii) inability to meet the contribution required (e.g. 20% own funding).

91. To overcome these difficulties, support is required for fishers to develop business plans, to raise TDB understanding of fisheries business cycles and fishing enterprises' erratic, or seasonal cash flows, and to develop means to avoid, or reduce risks, including, if possible, through insurance products⁷⁰. Approaches could include: development of standard business models for vessels, outboard motors, nets, fish fences or aquaculture, and training of fisheries staff (or staff in other agencies) to provide advisory services. The catch records provided by fishers through the creel surveys can also be developed as a historical catch and cash flow record to substantiate loan applications. Some small-scale fishers currently borrow from private sector moneylenders. With the cooperation of the lenders, information on the performance of loans for different assets (motors, vessels) could also be collected to profile business plans. However, the Fisheries Division has poor capacity to provide these types of extension and advisory services and collaboration with the Tonga Business Enterprise Centre⁷¹ will be critical in providing business planning support to fishers. Other means of sharing business risks and accessing finance, such as a partial guarantee fund, or development of specific fisheries microfinance products could also be envisaged. Particular attention can also be directed to improving the role of women in business⁷². Private

⁶⁹ This includes the (full) value of some regional projects in which Tonga is participating (e.g. ACIAR pearl development) and does not necessarily reflect the value of the project to Tonga.

⁷⁰ For example, insurance for fishing vessels can be either prohibitively costly, or un-obtainable.

⁷¹ See: Evaluation report for Tonga Business Enterprise Centre. Final report. New Zealand Aid Programme. Final 10-03-2014.

⁷² Cutura, J. and Van Hooft, c. 2008. Women in business in Tonga. World Bank/ AusAID.

sector views on research priorities could also be assessed with a view to making the limited research efforts directly applicable to development issues while maintaining efforts to monitor the status of marine resources. Although there have not been any issues with the sanitary quality or quarantine issues in relation to Tonga's fish exports sanitary testing facilities are weak with little capacity in veterinary or public health laboratories. While most of the daily fish catch is sold and consumed on the same day and sanitary issues have not been reported, improvement in fish handling practices are desirable, including simple measures such as curtailing washing of fish with harbour water.

92. Major fisheries-related concerns for the poorer and more isolated communities (as expressed through the TRIP/ MORDI planning exercises) include the availability of affordable fishing gear (even simple gear, such as diving masks, or shafts for spears); affordable credit on terms appropriate to fisheries (e.g. collateral and duration and timing of repayments related to catch seasonality); access to markets (reliable transport links and availability of ice); and safety at sea.

93. The TFSP will need to address these needs. Several approaches can be considered. A revolving fund could be established to provide low-interest working capital to fishing gear importers, subject to certain conditions. These could include combining and scheduling orders to reduce costs for bulk purchases, adherence to 'normal' mark-ups and profit margins and undertakings to maintain stocks of key supplies and ensure their distribution to outer island retailers. A similar arrangement could be envisaged for imports of boats, boatbuilding materials (e.g. GRP resin), marine engines and sea safety supplies (life jackets, life rafts, flares, radios). In both cases the imports could benefit from customs tariff exemptions and by aggregating orders the processes would be reduced. Periodic spot checks on prices and margins could be done by fisheries staff and/ or the NFC. Examination of the transport logistics in each island group could suggest efficiency gains possibly by better alignment of the return of visiting government officials with weekend market opportunities. South Pacific Business Development provides an example of an expanding microfinance agency providing loans, savings, insurance, training and advisory services. It impacts over 40,000 families and has a focus on empowering disadvantaged women. Although social and contractual difficulties may arise, when fishing permits, or licenses are limited the 'title' may serve as a form of collateral and facilitate access to credit.

2.7.3 National Fisheries Council

94. The National Fisheries Council has made specific requests for a range of public supports⁷³. These include improved access to credit, specifically a longer term for loans from the funds already made available through the TDB as the current period of less than a year is inadequate for purchase of vessels or other major capital equipment. To support the smaller and tuna export the need for increased ice making capacity and chill rooms and for an export fish processing area (sorting, cleaning, heading, gutting, icing), particularly at Nukualofa has been identified. Entrepreneurs also require operating capital to avail of economies of scale in import of bait and to offset costs of air freight and associated risks of 'up front' freight payments.

95. The National Fisheries Council is intended to be representative of the entire range of fisheries sector stakeholders. However it is currently dominated by the Nuku'alofa representatives of the exporters both in design and practice for several reasons. The under the Council's constitution⁷⁴ (which has come under internal review) the Executive is composed of five the NFC appointed officers (president and others), three government appointees and one representative from the Chamber of Commerce (all non-voting), four representatives from the NFC branches (islands) and seven members from 'elected registered entities' (understood to be the various commercial fishing associations, although few, if any, are formally registered). Participation by representatives of the outer islands and the small-scale and subsistence fishers is weak due to the costs of participation in meetings and the lack of organisation among the small-scale coastal fishers and the NFC island branches. As a result, it is difficult to mount a structured dialogue with a representative constituency of small-scale and subsistence fishers and the priorities indicated by some NFC's commercial fisher members may not reflect the needs of the smaller, more isolated fisheries-dependent communities – such as transport, communications, fuel costs, availability and cost of fishing gear and illegal and destructive fishing. A key action will be to make a national dialogue on fisheries more inclusive by structuring the small-scale fisher organisations. As motivation and incentives are key to building fisher organisations, the links between tenure (possible future limits on access) and fisher organisation and registration will need to be gradually developed.

96. As an umbrella organisation, appropriate mechanisms and strategies for good governance should be incorporated into the operations of NFC to make sure that everyone (stakeholders) are well represented and their voices are heard.. Therefore, NFC should be strengthened with appropriate resources to carry out such

⁷³ Itemised and costed as a distinct sub-component in the proposed budget.

⁷⁴ Registered 8 July 2013.

functions and bring together stakeholders at all levels, not only in Tongatapu but to all the island groups. Marketing and the provision of fisheries supplies, including bait, are the major constraints faced by small scale fishermen in the outer islands. Therefore, if the NFC is able to assist in minimizing constraints faced by rural communities, this would be the first step to garner the support, and strengthen their partnership with not only the commercial fishermen, but also the small scale fishermen, voicing all stakeholders under this one umbrella..

2.7.1 Climate change and Disaster Risk Management (DRM)

97. Tonga is one of the most vulnerable countries in the world⁷⁵ to the combined threats of natural disasters and climate change - cyclones, droughts, sea-level-rise⁷⁶, land and ocean temperature changes and ocean acidification. Tonga is projected to experience elevated sea levels, sea surface temperature, acidification and reduced nutrient supply and rainfall. The impact of combined stressors is likely to lead to substantial loss of coral reefs (currently covering 5,800 km²)⁷⁷ and their environmental services, including to fisheries, tourism and coastal protection. Projections⁷⁸ for loss of coral reef area range from 25-65% (IPCC B1/A2, 2035 scenarios) to 50-75% (B1, 2100 scenario). Catches of demersal species are projected to decrease by 20% and near-shore pelagic fish to increase by 20%. Skipjack catches are expected to increase, but catches of bigeye are expected to decrease. Productivity of molluscs and mollusc aquaculture is likely to decrease, though productivity of seaweeds may increase. The future of the entire fisheries sector needs to be viewed through a climate change lens, particularly with respect to projections on loss of coral reefs - the marine natural resource foundation of much of Tongan society. Only substantial mitigation of CO₂ emissions at global level can halt the degradation of Tonga's coral reefs: adaptation measures can only slow the degradation and resulting impacts; without mitigation, adaptation measures are not expected to halt the eventual disappearance of Tonga's coral reefs.

Box 2 Ocean Acidification

Over the coming decades and centuries, ocean health will become increasingly stressed by at least three interacting factors. Rising seawater temperature, ocean acidification⁷⁹ and reduced ocean oxygen (deoxygenation) will cause substantial changes in marine physics, chemistry and biology. These changes will affect the ocean in ways that we are only beginning to understand.

Ocean acidification is directly caused by the increase of carbon dioxide (CO₂) levels in the atmosphere. When CO₂ enters the ocean it rapidly goes through a series of chemical reactions which increase the acidity of the surface seawater (lowering its pH). The ocean has already removed about 30% of anthropogenic, or 'man-made' CO₂ over the last 250 years, increasing ocean acidity at a rate not seen for around 60 million years.

On one hand, the ocean's uptake of CO₂ has helped slow the rate of global warming; without this ocean sink, atmospheric CO₂ levels would already be greater than 450 ppm. However, the continuation of such a fundamental and rapid change to ocean chemistry is bad news for life in the sea. It will not only cause problems for many organisms with calcium carbonate skeletons or shells (such as oysters, mussels, corals and some planktonic species) but could also impact many other organisms, ecosystems and processes with potentially serious implications for society. The average acidity of the upper ocean has already increased by about 30% since the industrial revolution and it is expected that surface waters could be 150% more acidic by the end of the century if CO₂ emissions continue at the current rate.

Ocean acidification can make species more susceptible to the impacts of warming waters, and higher CO₂ alongside lower oxygen levels means animals will find it harder to breathe. These combined stresses will threaten biogeochemical cycles, ecosystems (such as coral reefs) and the goods and services the ocean provides to society, thereby increasing the risk to human food security and industries depending on productive marine ecosystems. Alterations in the exchange of gases between the atmosphere and ocean will also generate further impacts on climate change.

98. Tonga's Climate Change Policy (2006) recognised the weak knowledge, physical and financial resources, a comprehensive environmental legislation, poor policy and public management coherence and poor

⁷⁵ UNU, 2013. World Risk Report.

⁷⁶ Estimated at 7mm/ year. (South Pacific Sea Level and Climate Monitoring Project, 2006. Pacific Country Report. Sea Level & Climate: Their Present State. Tonga. June 2006)

⁷⁷ Estimates of coral reef cover and vulnerability vary from 1500 km² with projected losses of 16% to 2035 and 27% to 2100 (various sources).

⁷⁸ Bell, J. et al. 2011. Vulnerability of Tropical Pacific Fisheries and Aquaculture to Climate Change. SPC Noumea.

⁷⁹ Based on: Turley C, et al. 2013. Sour and Breathless – Ocean under stress. Plymouth Marine Laboratory, UK Ocean Acidification Research Programme et al. ISBN: 978-0-9519618-6-5.

public participation and lack of political will. Tonga's Joint National Action Plan on Climate Change Adaptation and Disaster Risk Management 2010–2015 (JNAP), approved by Cabinet in July 2010 sets out to address many of these constraints, outlines several strategic goals including improved governance, enhanced technical capacity and awareness, and community preparedness and resilience, all of which are directly relevant particularly to community fisheries⁸⁰. Sustainable management of fisheries has a vital role to play in mitigating stresses on coral reefs through a broad suite of measures ranging from monitoring of reef health, through community awareness building, development of an effective network of SMAs, promotion of 'climate proofed' fisheries infrastructure and operations and incorporation of disaster risk and management into plans and programmes. A wide range of advice⁸¹ is available on adaptation to climate change in fisheries. The overarching themes are raising awareness, building sustainable fisheries, improving community resilience as part of national efforts to improve food security, economic opportunities and sustainable livelihoods; financing adaptation and mainstreaming climate change into decision-making at all levels. Additional mapping of vulnerability will help target interventions. Continued engagement in regional fora and in SIDs on ocean issues and the climate change agenda will be important for Tonga's fisheries.

99. Tonga's contribution to the marine dimension of mitigation can include conservation of blue carbon sinks⁸², such as seagrass beds and mangroves; fuel efficient fishing operations (which rely heavily on healthy fish stocks) and use of renewable energy. Some sites in Tonga, such as reef passages with high currents, may have significant potential for harnessing tidal power, while cyclone-resistant wind⁸³ and solar power units are also being developed.

2.7.2 Fisheries Growth Committee, Corporate Plan and international obligations

100. Stakeholder engagement. Tonga has made significant progress in stakeholder engagement through the Fisheries Growth Committee (Cabinet Decision 2012) and the establishment of the National Fisheries Council. The Council is an umbrella organisation for several associations, all of which appear to be relatively weak. The Fisheries Growth Committee, chaired by the Minister includes representation from the NFC along with senior MoF. The role of the Committee⁸⁴ includes providing advice on and facilitating the implementation of the plans and policies set out by the Government, enhancing dialogue between government and industry, improving enforcement and compliance, and improving the quality data and remittance of export proceeds. It reports to the National Growth Committee.

101. MAFFF has developed a corporate plan focused on delivering improved producer performance and sustainability. The plan (including the fisheries part of the plan) is largely aspirational in that it identifies the problems facing MAFFF and proposes solutions that generally call for additional resources. Although most of the demands for staffing and finding are realistic, the linkages to major initiatives and funding sources (such as for climate change adaptation) is relatively weak. The Division will need to separate core functions and the resources required from intermittent services (such as surveys) and investments (such as in aquaculture) and prioritise accordingly with a view to establishing a more robust core functionality. It is clear that the current financial and human resources are inadequate for the core functions, such as MCS, implementation of management plans and monitoring of the state of the fisheries. Consequently, new development initiatives are unlikely to advance without building the human resource base, securing basic functions and nurturing a stepwise plan for priority initiatives.

102. Several international initiatives and accompanying obligations are of major importance to Tonga's fisheries. Tonga relies heavily on regional cooperation through SPC, FFA and regional development assistance

⁸⁰ A useful framework for risk governance is provided by: Renn, O, Risk Governance: Towards an Integrative Approach. International Risk Governance Council (www.irgc.org).

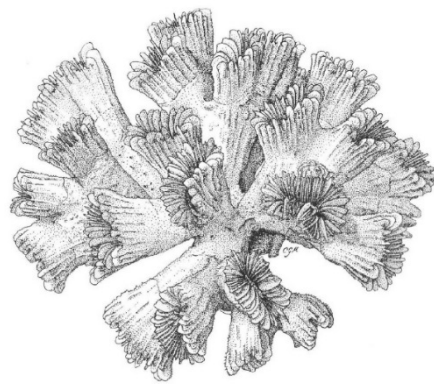
⁸¹ IFAD, 2014. Guidelines for Integrating Climate Change Adaptation into Fisheries; Johnson, J. et al. 2013. Priority adaptations to climate change for Pacific fisheries and aquaculture. Reducing risks and capitalizing on opportunities. FAO/Secretariat of the Pacific Community. Rome 2013; Shelton, C. 2014. Climate change adaptation in fisheries and aquaculture – compilation of initial examples. FAO Fisheries and Aquaculture Circular No. 1088. Rome, FAO. 34 pp; Kelleher, K., 2010. Adaptation strategies to climate change in developing country fisheries, OECD, Busan.

⁸² There may be opportunities to finance conservation and extension of coastal carbon sinks (blue carbon) by accessing climate funds: Climate Change Finance Portal
<http://www3.unfccc.int/pls/apex/f?p=116:1:712792402128641>

⁸³ <http://www.eib.org/infocentre/press/news/stories/2010-april-01/vanuatu-welcomes-eib-wind-farm-investment.htm>

⁸⁴ As per the role of the joint task force to be established (terms of reference of the FGC not sighted).

projects. Ideally, these efforts will build sufficient national capacity and be projected into the future to maintain essential fisheries activities, such as the VMS and statistical system and technical backstopping. Substantial time and effort of senior staff is devoted to participation in these international efforts and this needs to continue both to ensure participation in regional projects, to avail of training opportunities and secure funding opportunities. The international management of the tuna fisheries also requires substantial engagement of senior staff. In addition to FFA and WCPFC meetings, there are discussions on the US Multilateral Treaty (a source of revenue) and regional collaboration on enforcement through the Niue Treaty on Cooperation in Fisheries Surveillance and Law Enforcement in the South Pacific Region of 9 July 1992 and subsidiary arrangements: Te Vaka Moana and the Te Vaka Toa Arrangements, which adopted a strategic plan to maximise social and economic returns from the tuna fisheries through cooperation on the sustainable use of their fisheries resources with a particular focus on the albacore fishery. As already indicated, a sub-regional arrangement on the longline fisheries for (albacore, yellowfin and bigeye) requires serious consideration, if the sub-region is to capture an increased share of the value of this fishery and such negotiations would also require the engagement of senior officials. Participation in other fora on marine biodiversity, coral reefs, climate change, aquaculture, invasive species and fish trade may also place demands on senior staff.



PART II. THE TONGA FISHERIES SECTOR PLAN



3 DEVELOPMENT OF THE FISHERIES SECTOR PLAN

3.1 INTRODUCTION AND RATIONALE

103. The Tonga Fisheries Sector Plan (TFSP) is a tool to organise, coordinate and implement priority fisheries activities within Tonga's Strategic Development Framework. The TFSP provides a consensus vision for the future of the fisheries sector and a process for realising that future. It provides a set of objectives consistent with national policies and plans, a prioritisation of activities with steps and milestones and a description of the resources required to realise that vision. The TFSP identifies (potential) sources of human and financial support to develop and implement the TFSP.

104. The TFSP is an adaptive tool rather than a static blueprint: details of the priorities, allocation of resources and modalities of cooperation and coordination will be the subject of discussion and refinement in the sector. Dialogue with Tonga's planning and finance authorities will be required on budgets, development of human resources and integration of activities with other initiatives; discussions with key development assistance partners on mobilising resources will be required; greater engagement with civil society and across the political spectrum will help consolidate efforts at all levels. In particular, a consultation process with small-scale fisheries and outer island stakeholders will be required during finalisation and implementation of the TFSP to adequately reflect the stakeholder vision as a cornerstone of the TFSP. The TFSP is a framework provided to guide and advance these dialogues and engagements, a means to focus and mobilise resources consensus and actions. The TFSP is organised in the following manner:

- a) the key challenges are summarised and stakeholders identified
- b) the objectives and strategic goals (consistent with national and sector policy) are stated
- c) a set of priority outcomes and associated activities are identified as components of the TFSP
- d) resources to help achieve these outcomes are proposed

3.1.1 Key challenges

105. The following are the key challenges facing sustainable fisheries management and development in Tonga:

- a) strong persistent political will to support sustainable development
- b) many coastal community fisheries are increasingly depleted; the ability to enforce the (legislated) regulations at community level is weak, or non-existent, and community co-management is at an early stage of development, both in terms of its organisation and geographical coverage
- c) most of the commercial coastal fisheries are depleted and exports have declined substantially with poor prospects for recovery; management plans have proved difficult to implement
- d) the large-scale tuna fishery and the deepwater snapper fishery are limited by logistic and infrastructure constraints; the snapper fishery is threatened by economic overfishing (rather than by resource depletion) requiring a strong economic dimension to the management; slow progress on sub-regional economic cooperation on the tuna longline fishery is a missed opportunity
- e) lack of guidelines on investment, including on foreign investment in aquaculture, constrain investments
- f) public-private partnerships and engagement with industry and civil society are at an early stage and the dialogue with sector stakeholders requires greater engagement with outer island communities
- g) government support services are inadequate at all levels and budget and other resource constraints will limit government intervention funded from internal resources.
- h) at all levels, they need appropriate tools and equipment (such as boat and fishing gears) to enable them to shift or disperse efforts from the areas of high concentration of effort to other locations

3.1.2 Stakeholders

106. The primary stakeholders in terms of number, poverty levels and vulnerability are the coastal fishing communities, particularly women. In terms of contributions to economic growth and development, the commercial coastal and large scale fishers and support services are primary stakeholders. Government services, including MAFFF, and other concerned government ministries, agencies and the local authorities are also key stakeholders. The roles of political and civil society leaders are crucial in developing and implementing the TFSP, while the engagement of regional and international development partners is fundamental. Representation of the small-scale fishers and isolated island communities (through the NFC) is poor and the TFSP requires specific attention to engagement with these communities and stakeholders, through provisions for fisheries in the district and island development plans, through networks of SMAs and development of fisheries associations and local NFC branches.

107. Women have virtually no role in the large-scale fisheries. Women (and children) account for a substantial proportion of the gleaning of which the surplus to auto-consumption is marketed by women. There is provision for women's representation on the SMA committees and women have a voice with respect to their allotted SMA task. The TFSP could undertake specific initiatives⁸⁵ to empower women in fisheries, including use of existing women's organisations at community level and organising the gleaners in associations to manage the fishing grounds. Any SMA leadership training for women would have to be sensitive to the change in the traditional roles of women.

108. There may be some stakeholder resistance to foreign investment in a sector with relatively few opportunities. However, domestic sources of finance for development of fisheries infrastructure, for value added enterprises, marine tourism, aquaculture, vessel repair and maintenance services, or for marine energy is scarce and domestic resources and concessions could be used to leverage local engagement in joint venture investments within a clear foreign investment policy and code.

General public, especially consumer is an important stakeholder component, in terms of domestic and export market. The market force (domestic and export) through consumer is one of the most powerful factor that can influence political power and any stakeholder that practices sustainable production strategies to change the other way round for special and personal benefit. Appropriate awareness and relevant educational information of this stakeholder are always an important component of sustainability equation.

Principles and objectives

109. Tonga's vision is: to develop and promote a just, fair and equitable society in which the people of Tonga enjoy prosperity, peace and harmony in meeting their aspirations in life. The mission of the MAFFF is "to help build better agriculture, forestry and fisheries sectors that contribute significantly to better living standards of all, in an economically, socially and environmentally sustainable manner for present and future generations". For the fisheries sector it means:

- a) community fisheries providing local (fish) food security, incomes and employment; helping maintain the economic and social integrity and stability of communities particularly dependent on fisheries; and improving their resilience to climate change or natural disasters
- b) stable and profitable coastal commercial fisheries and marine resource use providing employment and livelihoods to fishers, particularly to women engaged in harvesting or post-harvest activities
- c) a steady expansion of profitable commercial tuna fisheries and the value captured by Tonga from these fisheries; a stable and profitable deepwater snapper fishery.
- d) expansion of aquaculture through long-term investment by responsible entrepreneurs in suitable culture systems, including in close collaboration with small-scale fish farmers
- e) an efficient suite of government support and regulatory services backed by coherent and realistic policies, plans and implementation modalities prepared in close consultation with stakeholders.

110. The overall objective of the TFSP is **to increase the sustainable shared benefits⁸⁶ for Tonga from optimal use of the living marine resources**. This objective is consistent with Tonga's vision, MAFFF's mission and the Pacific Islands' Apia Policy⁸⁷ and addresses both the extractive and recreational use of marine

⁸⁵ Hedditch, S. and C. Manuel, 2010

⁸⁶ These shared benefits include incomes, employment and food security; the spiritual and cultural values associated with fisheries and the sea; and the capacity to make provisions for climate change and natural disasters,

⁸⁷ 'To ensure the optimal and sustainable use of coastal fisheries and their ecosystems by Pacific Island communities'. The guiding principles include: improved knowledge, effective management, broad-based environmental partnerships to ensure sustainable use of ecosystems, and a focus on women and youth.

resources and sustainable aquaculture development. The emphasis on shared benefits directly addresses the poverty and wellbeing and food security of communities, while the optimum use recognises that sustainable benefits rely on management of the region's oceanic and coastal fisheries, and the critical habitats that sustain them. Social harmony, stakeholder dialogue and consensus will be underlying principles of the TFSP implementation.

111. The long-term goals of the TFSP relate directly to the future vision described above (paragraph 109) and the Government's vision and outcome objectives as described in the TFSD (see annex) as follows:

Goal 1. Sustainable community fisheries and use of coastal marine ecosystems

Goal 2. Profitable, sustainable and responsible commercial fisheries and aquaculture contributing to economic growth and revenues

Goal 3. Efficient and knowledge-based government services and effective collaboration with industry and civil society

112. Goal 1 extends beyond the remit of MoF, but the environmental dimension is considered fundamental to the long-term health of the communities while the community development dimension spans a range of public investments and civil society initiatives. Goal 2 requires public and private investments and a favourable investment climate. Goal 3 is underpinned by capacity building in both public and private sectors, transparency and cooperation with the private sector, adaptive management and a robust legal framework.

4 COMPONENTS OF THE TONGA FISHERIES SECTOR PLAN

113. The TFSP is divided into four main components and several sub-components with the intention that some of these units could be further developed as specific programmes or projects eligible for support or co-financing from development partners. The implementation, timescale and cost estimates for such initiatives would require discussion with development partners. The components are:

Component 1. Sustainable community fisheries

Component 2. Profitable commercial fisheries and aquaculture

Component 3. Public and private investment

Component 4. Governance and capacity building

4.1 COMPONENT 1. SUSTAINABLE COMMUNITY FISHERIES

114. The Component involves three sub-components focused on ***Goal 1. Sustainable community fisheries and use of coastal marine ecosystems*** by developing strong inclusive communities and links to climate change adaptation and disaster risk management initiatives. Because of their social importance, the TFSP would direct the majority of available resources to community fisheries under three sub-components:

Sub-component 1.1. Enhancement of the Special Management Area (SMA) programme

Sub-component 1.2. Expansion of the SMA network

Sub-component 1.3. Management of community fisheries

4.1.1 Sub-component 1.1. Enhancement of the SMA programme

115. The outcome for the sub-component would be to ensure effective operation of SMAs. Sub-component 1 would secure the foundation of the SMA framework to enable replication and expansion in Sub-component 2. The sub-component would have the following activities:

- a) an on-going adaptive management programme for SMAs to develop and implement best practices. In association with the communities, the programme would enhance the current⁸⁸ monitoring and review of SMA performance, using metrics developed in association with communities, measurable by the communities and directly linked to community decisions on SMAs.

⁸⁸ The regular reporting by SMAs to the Fisheries Division; reports of the Community Development and Advisory Section (CDAS) and analyses, such as, Webster, F. 2013. Analysis of Special Management Area (SMA) community data. Department of Fisheries, Community Management Section. October 2013.

- b) improvement of the SMA regulatory framework to allow progressive delegation of authority to communities over SMAs and facilitate changes in SMA by-laws and community enforcement measures (closely linked to the Component 4. Governance)
- c) grant assistance to SMA's for mapping, marking, enforcement and community development
- d) leadership training for community leaders, for youth and women's group leaders and leaders of local commercial fisheries (closely linked to Component 4. Capacity building)
- e) awareness raising at all levels, including in schools, in neighbouring communities, among commercial fishers, in local authorities and among local political leaders
- f) progressive valuation of SMA environmental and social impacts of SMAs and costs of SMA establishment and operation as knowledge of SMAs accumulates

116. The inputs required for the sub-component would include the following, provided through a combination of prioritised public resource allocation and development assistance:

- a) establishment of a multi-disciplinary community fisheries team including environmental and social science professionals supported by an advisory group which includes civil society and other agencies at national and island group levels. The teams would be suitably equipped on each island group (transport, including seaworthy vessels with adequate safety equipment; communications; dry storage for computer, audio-visual, or scientific equipment; diving gear; survey and measuring devices; GPS) and provided with adequate operating expenses to support and adaptive SMA programme.
- b) placement of community fisheries staff and operating funds in the outer islands groups, assisted where possible by volunteers secured through by development partners, and /or universities and NGOs engaged in coral reef studies and conservation.
- c) social and legal studies on emerging issues, including relationships with neighbouring SMAs and communities, legal aspects of community enforcement and establishment of bye-laws, use rights in the SMA (e.g. for clam gardens, seaweed culture, access), conflict resolution and governance (e.g. application of environmental (non-fisheries) regulations through the SMA instrument),
- d) technical services on community development and development of school curriculum modules, radio programs and other media required to raise awareness at all levels
- e) workshops for SMA leaders to exchange knowledge and experiences
- f) high-level national seminars on SMAs and community fisheries leadership
- g) SMA small grants programme to assist SMA. Grants would be linked to preparation of community plans for maintenance and replacement of assets. Where appropriate, the SMA framework could be used to channel available grants, or support for adaptation to climate change and disaster preparedness.

4.1.2 Sub-component 1.2. Expansion of the SMA network

117. The long-term outcome would be to create an effective SMA network covering the majority of Tonga's coastal fisheries and take appropriate SMA approach to multi-villages and multi-resource users (including inland villages) and pilot at least two communities of this type. This sub-component would be based on successes and experiences from sub-component 1.1. and would have the following activities:

- a) identification of the most vulnerable communities and areas of special environmental value in order to prioritise and target communities and areas
- b) preparation and submission of medium/long-term programme for SMA development and management, including a schedule of priority SMAs, financing plans and sourcing of the required human and financial resources from internal and external sources
- c) implementation of the programme, which would involve activities and steps identified as best practices under Sub-component 1.1. and include the following
 - consultations with the identified communities to initiate dialogue on establishment of SMAs
 - inclusion of communities in the SMA development programme subject to political willingness and contributions and commitments from the communities
 - support for community initiatives on sustainable use of marine resources, diversification of livelihoods and businesses, including development of handicrafts, aquaculture, tourism, marine leisure and tourism
 - mainstreaming SMA principles and practices into community development programmes, climate change adaptation, disaster risk management, school curricula and cultural events

118. The inputs required for the Sub-component would include:

- a) establishment of an expanded SMA unit to manage the programme
- b) medium/ long-term financing in accordance with a realistic schedule of SMA establishment and development
- c) measures to raise political commitment for resolution of key tenure and empowerment issues

- d) engagement with other (non-fisheries) stakeholders through advisory groups and civil society
- e) partnerships with organisations that have experience and skills in community co-management and MPA design, management and financing; with partners who can provide skilled volunteer services; and with local NGO partners.

4.1.3 Sub-component 1.3. Management and development of coastal fisheries

119. This sub-component would develop the framework for overall management and development of the coastal fisheries both within and outside of SMAs and fisheries not covered by specific management plans. The SMA programme is considered as a part of this overall framework. The outcomes would be: (i) effective management of coastal fisheries, particularly those outside the scope of the SMAs and not covered by specific management plans; (ii) pro-active and responsible coastal fisheries organisations; (iii) improved access to services by coastal fishing communities, particularly to markets, finance and business development (there would be some overlap with activities under component 2, commercial fisheries).

120. The activities would include:

- a) periodic (every five years) frame surveys of coastal fisheries to establish numbers of fishers, vessels and gears, estimate catches and use of catches and provide a basis for improved sector planning and service delivery. The Fisheries Division would draw on expertise available through SPC and FAO to establish the methodology, train enumerators and analyse the data
- b) organisation of small-scale commercial fishers into groups and associations with registers, codes of practice and reporting obligations, including boat owners, gleaners (collectors) and women fishers, owners of fish fences, divers and fish buyers
- c) development of rules for management of discrete manageable fishery units (on access, effort and co-management modalities). The units would be variously defined in terms target species, area or communities, groups of fishers, i.e. whatever constitutes the most ‘manageable’ arrangements and units in the combined views of the stakeholders.
- d) assistance in developing programs where small scale fishermen can acquire necessary tools and equipment such as fishing boat, fishing gear and related supplies which will enable them to fully participate in the fishery while complying harvest rules and management plan
- e) assistance in developing group or community initiatives, including to access small grants, credit, climate change adaption and disaster preparedness finance and develop market and business opportunities.

4.2 COMPONENT 2. PROFITABLE COMMERCIAL FISHERIES AND AQUACULTURE

121. The activities under Component 2 contribute to Goal 2: profitable, sustainable and responsible commercial fisheries and aquaculture contributing to economic growth and revenues. The Component involves two closely related sub-components: (i) Sub-component 1. Sustainable management of commercial fisheries through management plans; and (ii) Sub-component 2. Economic development of commercial fisheries and aquaculture. Firstly, the outcomes, activities and inputs required for each sub-component are summarised for all the fisheries as a group. Secondly, the specific approaches, actions and results for each of the major fisheries are detailed.

122. A distinction is made between community and commercial fisheries in terms of approach, although there is clearly significant overlap between both categories. The fundamental difference in approach to managing the community and commercial fisheries is the nature of the fishing rights. In the case of the SMAs and local community fisheries, community rules on access and resource use will be developed and enhanced and the incentive structure will be largely a function of social pressures in and between communities. Access to the fishery is open only to community members or through community consensus. In the case of the commercial fisheries the access and harvest rights are essentially limited to the license holders through legislation and the decisions on access and harvesting are made in consultation with the stakeholders and with respect to overall national interest. The state may extract a resource rent. The distinction between community and commercial fisheries will be determined on a case-by-case basis reflecting the economic importance of the fishery, status of the fishery resources, whether a distinct group of fishers are involved and may vary by island group. The fisheries with management plans are considered commercial fisheries.

4.2.1 Sub-component 2.1. Management of commercial fisheries

123. The outcome of this sub-component would be “healthy commercial fish stocks and effective control of effort through participatory management”. The activities would include the following:

- a) adaptation of existing management plans to meet changes in the fisheries and effective implementation of the plans including:

- establishment of a consensus vision for each fishery and on the major short and medium-term steps and milestones to archive the long-term vision
 - re-activate relevant fishery management committees to undertake their designated tasks
 - through stakeholder dialogue, establishment of priority actions for each plan, the responsibilities for the actions and the resources and commitments required and (given the scarce resources available) a realistic schedule for implementation of the actions
 - establishment of an advisory group for each fishery charged with monitoring and reporting on progress, on constraints and solutions and making key decision makers aware of the priority issues and options.
- b) specific attention to the design of the fishing rights regime for each fishery, including the term (e.g. duration of fishing or aquaculture licenses), transferability and security of title to the rights, use rights as security for credits, and the relationship between rights and investment.
- c) specific attention to the economics of the commercial fisheries to provide a robust economic basis for management advice and decisions and to ensure the profitability of these fisheries
- d) improvements in the enforcement of harvesting rules and regulations, including registration of commercial fishers and fishing vessels and catch reporting, including through fisher associations.

124. The inputs required include:

- a) participatory review and updating of management plans, where necessary, with independent (external) advice (i.e. ongoing adaptation of the management of the plans)
- b) assignment of responsibility (designated fisheries officers and stakeholder representatives) for implementation, timely reporting and oversight of implementation of the plans (e.g. quarterly meetings of management plan co-management groups with reports provided to the minister)
- c) determination of resources for implementation of priority actions and allocation of available resources (focusing on realistic targets and timescales, best use of available resources and sourcing additional resources and partnership arrangements)
- d) timely collection and analysis of economic data on each fishery, including reporting on cost and earnings, remittances from exports and impact of changes in the fishery (e.g. fuel prices, market conditions, transport and logistics)
- e) continued fulfilment of international fisheries obligations, particularly with respect to the tuna longline fishery active in the sub-region.

4.2.2 Sub-component 2.2. Economic development of commercial fisheries and aquaculture

125. The outcome would be an expanding economic contribution from the commercial fisheries. This would be achieved through more profitable harvesting as a result of stock rebuilding and effort control; through investments in aquaculture and capture fishery production; and through value-added post-harvest activities and marketing. This sub-component will support the commercial aquaculture subsector, along with the tuna, deepwater snapper, beche-de-mer and other small-scale commercial fisheries.

126. A diverse suite of actions are envisaged to achieve this outcome across commercial fisheries and aquaculture. Investments in infrastructure are considered separately under Component 3. Under this sub-component, activities include:

- a) strengthening of the fisher associations and their engagement in the co-management processes linked to each management plan
- b) addressing the control of fishing effort through market mechanisms and economic incentives based on the fishing rights regimes for each fishery, including trading of fishing rights, such as licenses or fishing days
- c) initiatives to match fish supply with demand and improvements to fish quality for domestic and export markets
- d) review of existing fisheries credit operations, including non-bank credit to improve and extend the access of fishers and sector businesses to credit
- e) provision of incentives for innovation, for example, through a development marketplace⁸⁹ mechanism

127. The inputs required include:

- a) review of models for public private partnerships in other sectors in Tonga to apply best practices and lessons, to clearly prescribe and limit the role of the state, the policies and principles for use of public assets by the private sector, and the modalities of public support for credit and to stakeholder organisations; to specify the obligations of private sector partners and means of establishing, resourcing, monitoring and exiting the arrangements. Such a review would be envisaged in close association with the finance and planning ministry

⁸⁹ <http://wbi.worldbank.org/developmentmarketplace/>

- b) technical and business advisory services⁹⁰ to small-scale fishers and associations, including means of matching supply with demand (e.g., through supply contracts with institutional buyers, dissemination of price information via text messaging, weather-related supply projections, rotation of fishing days by association members)
- c) extension of credit facilities (concessional interest rates, credit guarantees) to sector operators subject to review of and application of lessons from past and existing credit operations and alignment of the necessary support services
- d) support for maintenance and upgrading of services for sanitary certification of exports, fish processing establishments and fishing vessels as may be required.

4.2.3 The tuna fishery

128. A range of activities are set out in the Tuna Management and Development Plan (2012-2015 and draft 2015-2017). Given the limited resources available these activities would be prioritised around the key goal of maximising the benefit to Tonga from a sustainable tuna fishery⁹¹. These actions include:

- a) fulfilment of Tonga's international obligations (WCPFC and FFA), including any required updates to the legislation
- b) continued support for the Tonga longline fleet (customs tariffs, sanitary certificates, and other services at affordable rates)
- c) dialogue with the foreign longline fleet on long term access concessions linked to increased benefits to Tonga (shore investments and basing of vessels, landings, value added activities, crewing, banking, fueling, maintenance)
- d) support for private sector initiatives on (i) small-scale fishing for tuna and coastal pelagics (e.g. vessel charter, 'private' FADs); and (ii) shore processing (allocation of developed sites in the port area)
- e) regional dialogue on establishment of a 'PNA-type' regime for the sub-regional longline fishery

129. Inputs would include:

- a) Re-activate Tuna Fisheries Management Committee to operate as per designated tasks
- b) Designation of an in-house multi-disciplinary tuna management team and team leadership in the Fisheries Department. The team would draw on a number of different units (MCS, Management, Offshore) and would liaise closely and report to Tuna Fisheries Management Committee.
- c) Recruitment of a regional tuna consultant to identify, cost and resource the priority steps; and to provide capacity building, mentoring and monitoring of the TFDP implementation. Ideally this would be arranged through the FFA as a follow-up to previous work referred to above.

4.2.4 Deepwater snapper

130. The number of licenses would be strictly maintained at current levels and all snapper fishing vessels would be licensed. The existing catch and effort monitoring would be maintained and reinforced and extended to the smaller deepwater snapper fishing vessels with regular submission of cost and earnings information to enable estimates of MEY and economic rents to be made. Through stakeholder dialogue, consideration would be given to the following additional management measures:

- a) rotation of fishing grounds through agreed co-management measures and installation of low-cost tracking devices on all vessels (not in real time via satellite)
- b)
- c) establish good and low cost effective communication system such as coastal radio communication and tracking system to use by all fishing vessels for safety and management purposes
- d) cooperative arrangements on air freight, including establishment of cold room facilities at Fua'motu; sharing arrangements for limited air freight capacity (to avoid situations where export volumes exceed air freight capacity) and initiatives to expand market access and improve transport logistics
- e) ecolabelling of the fishery to add value and develop a market niche and assistance for development of new markets for existing and 'new' species, such as bluenose
- f) in the medium/ long-term, development of a tradable days-at sea scheme to enable the fleet to adjust to an optimum economic size (the alternative is a trading scheme for long-term licenses, as a catch quota scheme is considered impractical).

⁹⁰ NZ has committed to provide support to the Tonga Business Enterprise Centre (\$1 million / 2 years), including support for business training via a Private Sector Training Programme.

⁹¹ Reid, C. et al. 2014. Key outcomes of discussion stakeholders consultation on the tuna plan review and bio-economic modelling.

131. NFC members have made suggestions for inclusion of specific support for the commercial finfish exporters in the TFSP. These suggestions, largely in support of the deepwater snapper and other finfish exports, include the following; and because of the relatively high cost of some items, they are included as a distinct and separate budget item:

- a) modification of the terms and conditions of the TDB fisheries concessional loan facility to enable its use for acquisition of vessels and capital items with a payback period of several years (the current period is nine months)
- b) matching grants for investment in commercial fisheries
- c) upgrading of fish handling facilities at the Tu'imatamoana market to enable sorting, cleaning and icing of export fish (using existing building)
- d) additional ice-making and cold storage (chill room) capacity at Tu'imatamoana, and ice-making at Niafu and Ha'apai
- e) reasonable size snapper boat with fishing gear for 'Eua fishermen to utilize close by fishing ground to enhance availability of quality fish in the island and also for export through Nuku'alofa
- f) working capital float for purchase of bait (container)
- g) subsidised air freight for up to 18 months to help establish markets.

4.2.5 Beche-de-mer

132. There would be strict enforcement of the moratorium, including on all exports and establishment of a fisher cooperative monopoly on processing and export (see par. 65). The cooperative would establish product grades and standards and establish standard prices and working conditions, including health and safety standards for any permitted diving operations. Sales arrangements would be negotiated with responsible buyers, if necessary on an auction basis and with a view to developing value added products in Tonga and establishing a Tonga brand. Discussions would be held with other PICs to exert more control over market prices through cooperative arrangements and sharing of information. Enhancement of stocks of high value species would be considered. Technical assistance from within the region on design and implementation of the scheme will be of value.

4.2.6 Other small-scale commercial fisheries

133. Other important small-scale fisheries (e.g. lobster, octopus divers, shell collectors, fish fence owners) would be encouraged to gradually develop a limited access regime. The schemes would operate as follows:

- a) registration of all fishers/ participants and vessels in the short term
- b) organisation of fishers in associations and development of rules on new entrants; the gradual introduction of limits on the number of participants, and introduction of complementary regulations by the fisheries administration
- c) development of association rules on harvesting and sale (closed seasons, areas, size limits, rotation of gleaning areas, bag limits to maintain market prices and share catches, and catch reporting)
- d) leadership training and technical assistance to the associations from the fisheries administration and civil society organisations, including for improved fish quality and handling.

4.2.7 Commercial aquaculture

134. Aquaculture development would be mainly orientated towards profitable businesses, requiring technical skills, medium/long-term investment and secure markets (mostly export markets), rather than promoted as an alternative livelihood. With some exceptions (e.g. clam gardens, live rock gardens, limutanga'u), substantial private investment would be required to achieve the necessary scale to support the technical skills required and returns on investment. Such new investments would require a clear aquaculture investment policy and favourable investment climate. The investors would identify viable production systems and government would provide support services rather than trying to 'pick winners'. The following activities would be undertaken:

- a) preparation of an aquaculture investment policy, with specific attention to foreign investment from reputable, financially sound, technically skilled investors with market access, willing to make long-term investments, engage in outgrower schemes and develop value added products
- b) facilitate of good access of participants in low cost, fast turn over aqua-farming such as seaweed, to credit scheme to assist their initial production operation
- c) preliminary spatial planning for aquaculture, including dialogue with concerned communities
- d) modalities for fast-tracking aquaculture investment approvals by streamlining bureaucratic processes, providing tax and other incentives and a facilitated investment process

- e) specific assistance for land and water leases for investors, for provision of energy and access routes, and for engagement with local communities, particularly with a view to outgrower farming systems
- f) maintenance and reinforcement of capabilities to monitor biosecurity hazards, including the government aquaculture infrastructure at Sopa
- g) assessment of the feasibility of enhancement of stocks of high value species (beche-de-mer, clams).

4.3 COMPONENT 3. PUBLIC AND PRIVATE INVESTMENT

135. This component contributes to **Goal 2: Profitable, sustainable and responsible commercial fisheries and aquaculture** by targeting public investments in infrastructure with the objective of facilitating private investments, particularly in the processing and marketing of fish. The outcome would be increased private investment and shore-based employment. Component 3 has two sub-components: Sub-component 1. Preparation for public investment in fisheries infrastructure; and Sub-component 2. Negotiation and implementation of infrastructure investment projects.

4.3.1 Sub-component 3.1. Preparation for public investment in fisheries infrastructure

136. In keeping with the principles of the National Infrastructure Investment Plan (NIIP) the activities include:

- a) preparation of plans for major public and public/ private investments, including in fishing harbour quays and vessel maintenance services, processing, cold storage market infrastructure and air freight facilities. In most cases such investments will require complementary public and private investments with public support for private sector access to power, water, road or sea access; and private sector investment in productive facilities such as fish processing and packing rooms. The plans would include initial feasibility studies, several stages of engineering plans, detailed financing studies and environmental impact assessments (EIAs).
- b) the plans would be prepared with respect to the following facilities: the Tu'imatamoana wharf and other port infrastructure (also see paragraph 131), the public fish market in Tongatapu and small fishing vessel landing site, airport cold storage, the Fisheries Division offices and aquaculture facilities at Sopa
- c) urgent need for a safe fishery wharf in 'Eua and upgrading fishery wharf in Ha'apai and Vava'u to incorporate climate resilient and safety aspects
- d) definition of modalities for private use of publicly-funded infrastructure and arrangements to finance maintenance and security, including leasing and use of quays or market space. These form an essential basis for estimating returns on investments and include draft MoUs, lease arrangements and (possibly) guarantees to construct processing or workshop facilities.

137. The inputs required include the following:

- a) economic and engineering studies and EIAs
- b) stakeholder dialogues on private investment and close articulation with policies on landing of tuna/ or basing of foreign tuna vessels; and with market operators on new, or improved public fish market premises
- c) discussions/ negotiations on financing of the infrastructure and integration with the NIIP

138. Port and airport facilities. A masterplan for the development of Tongatapu fishing port facilities and associated slipway and repair workshops is required⁹². The plan can form part of the existing Port Authority master plan. It would ensure that the wharf from the Tu'imatamoana market to the slipway area to the east is reserved and developed for fisheries. The plan would also address the need for private sector financing for development of fish handling and processing facilities and cold storage in this area. The Port Authority would also consider development of a quay wall and cold storage area on the mole opposite the Tu'imatamoana market. The masterplan would include a business plan for: (i) long-term leasing of areas for private investment in processing and cold storage areas; (ii) consideration of development costs, financing and economic viability; and (iii) a framework for appropriate fishing vessel wharfage charges; and (iv) arrangements for management of the fisheries areas and for dialogue between NFC and the Port Authority, including on arrangements for repair and maintenance and security (fencing, lighting). The area currently occupied by fish vendors and the quay areas used for unloading of small-scale catches would also form part of the plan. In the short-term, the National Fisheries Council (NFC), through joint action by the exporters, could consider accessing the concessional loan funds to install one or more plug-in freezer containers or a small cold room designed for ease of loading/unloading of the fresh fish air freight pallets.

⁹² This would draw on preliminary work already initiated (report not sighted).

139. Fisheries wharf for ‘Eua is urgently needed and this is the number one priority from this island. Once an appropriate climate resilient and safety fishery wharf is established, related fisheries development will be easily add on and build upon one another to provide conducive environment to practice sustainable fishing of immediate coastal resources.

140. Fisheries Division infrastructure. Major structural repair would be undertaken at the Fisheries Division’s offices in Sopus, including improved security for the servers and other key assets. Upgrading and possible expansion of the Sopus aquaculture facilities would be linked to an assessment of the long-term needs for office, workshop, laboratory, biosecurity and other requirements, and a commitment to ensure recurrent funding for maintenance. In order to retain qualified staff, consideration would also be given to construction of staff housing. The Ha’apai workshop and staff housing, damaged in the cyclone, requires extensive repair/replacement (already funded). Currently, the ‘Eua fisheries staff is housed at Agriculture’s office compound which is all right for the time being but there is need for appropriate long-term arrangement for this and even proper allocation of office space and staff housing. In addition, the Division’s small vessels require maintenance and upgrading, particularly with regard to safety (spare engines, life rafts, life jackets, radio if possible, and other equipment) and installation of dry storage on board for sensitive equipment (phones, computers, cameras, projectors).

4.3.2 Sub-component 2. Implementation of infrastructure investment projects.

141. This sub-component is not detailed at this stage as it is a follow-up to the planning exercises undertaken under sub-component 1. Preliminary estimates of costs involved are provided in the budget tables (see Table 2).

4.4 COMPONENT 4. GOOD GOVERNANCE AND CAPACITY BUILDING

142. Component 4 contributes to *Goal 3: Efficient and knowledge-based government services and effective collaboration with industry and civil society*. This goal is closely linked to those of the NSPF and the primary focus of the Component is the upgrading of the Fisheries Division. However, this upgrading involves targeted actions to coordinate and implement capacity building throughout the sector in support of components 1 and 2, including: improved business practices, leadership in fisheries associations and SMA committees, and development of sustainable marine resources modules in the school curriculum. This component, and in particular the fisheries management activities supported through the component, are seen less as a ‘fish’ problem and more of a political, social and economic problem. While sound science would be required to inform decisions, the social and economic trade-offs are also political issues and there is a prior history of political pressures undermining sound fisheries management in Tonga. The governance component would build the capacity to inform the political balance required to move the fisheries management agenda forward.

4.4.1 Sub-component 1. Capacity building in the fisheries administration

143. In order to implement the TFSP, the human resource capacity of the Fisheries Division needs substantial upgrading. Many of these activities would be required prior to significant engagement in implementing other components of the TFSP and include:

- a) determination of priority staffing requirements, taking into account the need for core staff and services and staff required on a project basis, and the skill sets required with particular emphasis on community development, economics (MEY estimates, value-chain analyses, business models and financing), IT services and project management
- b) establishment of additional permanent and temporary positions and their financing and recruitment
- c) development and implementation of a staff training programme at all levels with particular emphasis on leadership, teamwork and cooperation
- d) review and improvement of bureaucratic procedures to improve delivery of services, including consideration of the divisional status of the fisheries administration
- e) stakeholder dialogues to structure partnerships, synergies among government portfolios and plans, and mainstream the vision of sustainable and socially and economically successful fisheries into the agendas and activities of a wide range of government and civil society stakeholders
- f) improved and more timely monitoring and reporting on the state of the fisheries, including quarterly and annual Fisheries Division reports.

144. The inputs include:

- a) rapid deployment of a capacity building task force including representatives of the private sector (e.g. NFC), ministries responsible for the public service, and from the outer islands. The task force would be supported by external expertise from the region (e.g. SPC, FFA or a national fisheries administration) with experience in organisation and development of national fisheries administrations. The task force would make specific recommendations on the short-term staffing needs with a view to rapid recruitment and outline a medium-term staff development programme
- b) recruitment of priority staff to fill major staffing gaps, including for implementation of a capacity building programme (trainers)
- c) in the short-term, a capacity building programme for senior staff focused on leadership, teamwork, problem solving, skills for management of staff, finance and projects and training of trainers.
- d) technical assistance in support of the capacity building programme (mentoring and development of the medium-term programme), policy reform and socioeconomic analysis of the fisheries.

4.4.2 Sub-component 2. Coordination and support of stakeholder capacity building

145. The desired outcome would be enhanced engagement of stakeholders and empowerment of civil society groups with respect to a common vision for Tonga's fisheries. The following actions would be undertaken; the inputs are embedded in other components:

- a) establishment of a broad-based (open-ended) advisory group on fisheries to build cooperation and synergies among representatives of local development groups, cultural groups, women and youth groups, churches, fishing associations, educational institutes, tourism associations and conservation NGOs. The advisory group would have a core membership, hold regular open thematic meetings on different island groups and reports would be provided directly to the minister
- b) animation of the Fisheries Growth Committee and the Fisheries Management Committee and if necessary the reform of the latter to serve as a more functional co-management approach (currently it is largely a government construct)
- c) resourcing for capacity building and coordination of capacity building efforts with other related initiatives. The inputs required would include a dedicated staff member, funding for quarterly meetings, travel costs for core members of the group and educational materials.

4.4.3 Sub-component 3. Policy reform processes

146. The outcome of the sub-component would be coherent policies providing incentives for socially, economically and environmentally sustainable fisheries. The component would underpin the analyses, dialogues and reforms (policy, legislative, administrative) required to advance the shared vision for fisheries and the policy dimensions of the measures proposed under Components 1 and 2 above. The sub-component would include the following activities, some of which may require an extended period of discussion:

- a) analyses and national dialogue on:
 - a statement of national fisheries policy
 - limiting access to coastal fisheries
 - modalities for delegating increased authority over SMAs to the communities and managing the relationships between SMAs (i.e. increased stakeholder empowerment rather than requiring central or ministerial approval for changes in management modalities at community level)
 - foreign investment in fisheries and aquaculture and principles of small-holder outsourcing in aquaculture, including the timescale and transferability of aquaculture rights
 - creation of a cooperative monopoly for the beche-de-mer fishery
- b) improved transparency by making public the list of license and concession holders, fees paid or outstanding and lists of violators of the fisheries legislation. The rationale behind fees and charges would be examined and principles established
- c) development of memoranda of understanding, joint plans and other 'formal' arrangements between MAFFF and other government entities, for example: with the Navy on mission planning and cost sharing; with 'tourism' and with 'environment' on development of marine parks, management of SMA dive sites and development of other marine leisure activities
- d) support for development of a private sector principles and code of conduct for responsible fisheries for associations and enterprises
- e) possible development of a comprehensive oceans policy to generate synergies with the activities of other ministries (e.g., tourism, transport, energy, environment), and offer a long-term vision for engagement with stakeholders and development partners
- f) rectification of legislative gaps or amendments to legitimise policy changes

147. The following inputs would be required:

- a) support for policy analysis, including definition of the problems and proposed alternative solutions and their costs and benefits to different stakeholders. This would require some independent external advice provided through an overall package of technical assistance
- b) support for national stakeholder dialogues, including publication and dissemination of information on policy, seminars and public meetings
- c) advice on implementation of policy changes, including legal issues
- d) establishment of a development assistance coordinating group, chaired by a lead donor, and having regular (quarterly) meetings with the MAFFF with regard to a programme of implementation of the TFSP.

5 EXPECTED RESULTS OF THE TONGA FISHERIES SECTOR PLAN

148. The TFSP would contribute to three types of measurable results based on the overall objective of *increasing the sustainable shared benefits for Tonga from optimal use of the living marine resources*: (i) an increase in benefits from fisheries; (ii) sharing of those benefits and (iii) sustainability of fisheries dependent communities and their marine environment. The conditions required to generate many of those benefits extend beyond the remit of the fisheries administration, particularly with respect to the sharing of benefits and the impacts of climate change on the marine environment.

149. The increase in measurable benefits from effective implementation would be as follows. These benefits are closely linked to *Goal 1. Sustainable community fisheries and use of coastal marine ecosystems* and *Goal 2. Profitable, sustainable and responsible commercial fisheries and aquaculture contributing to economic growth and revenues*.

- a) an increase in sector contribution to GDP (although in the medium-term this is unlikely to reach previous peak levels)
- b) an increase in employment - this would be closely related to increased investments in aquaculture and in fish processing and handling
- c) reduced out-migration from Outer Island communities
- d) an increase in net foreign exchange
- e) stability, or modest increase in fish imports
- f) increased incomes for sector workers, including women and outer island communities
- g) increased enterprise profits and government revenues
- h) increased value added to products along value chains
- i) an increase in natural capital, produced wealth (productive investments) and intangible wealth (social structures, laws, human capacity).

150. Several types of benefits can be attributed to improved governance (*Goal 3. Efficient and knowledge-based government services and effective collaboration with industry and civil society*), many of which are less measurable social, economic and environmental benefits, including:

- a) safeguarding the fishery contribution to the food and economic security of coastal communities and their resilience to climate change
- b) transport logistics, tourism, foreign direct investment
- c) benefits from improved ecosystem services, including prevention of coastal erosion and other contributions to climate change adaptation and mitigation (fuel efficient fisheries and maintenance of carbon sinks)
- d) cost savings (more efficient public and private sectors)
- e) more effective regional cooperation on tuna could generate increased economic returns and cost savings through: (i) effort optimization, increased rents and license revenues; (ii) reduced illicit fishing activities and increased returns to legitimate operators; (iii) opportunities for investment and value added activities.

151. Specific target values for indicators would need to be established based on existing baseline information and establishment of missing baselines (to be developed through the frame surveys, linkages to household surveys and other means). At this stage of the TFSP it is not possible to suggest indicator values.

5.1.1 Beneficiaries

152. The main beneficiaries would be the vulnerable fishing communities that effectively develop and manage SMAs (primarily Component 1). The second group of beneficiaries are the commercial fishers, including other actors along the value chain mainly grouped around urban centres and in coastal Tongatapu

(mainly Components 2 and 3). Civil society organisations (such as fisheries associations)⁹³ would be primary beneficiaries from capacity building, empowerment and business development (mainly Components 2 and 4). A third group are the consumers who benefit from continued access to high nutritional value food. Public servants, mainly in the fisheries administration would also be primary beneficiaries in terms of capacity building, job satisfaction and advancement (mainly Component 4). Multiplier effects will benefit a range of service providers, while linkages to other sectors, such as tourism will generate additional beneficiaries. Improved ecosystem services will involve an extended group of coastal dwellers who benefit from coastal protection.

5.1.2 Cost-benefit analysis

153. No quantitative cost-benefit analysis has been made at this stage of the TFSP. Such an analysis would require two complementary estimates of benefits with their respective assumptions: (i) estimates of the increase in production, incomes, nutrition and well-being resulting from the interventions; and (ii) projections of the continued decline in marine resource productivity and its social and economic impact on communities in the absence of the interventions – the latter possibly being of greater importance.



⁹³ These organisations include the Tonga National Fisheries Association, an umbrella NGO for fisheries, working to advocate and assist in raising public awareness through its members (subsistence, artisanal, and commercial fishermen); the Tonga Community Development Trust; the Civil Society Forum of Tonga, mandated “To provide strong Leadership to developing an effective Civil Society Sector in Tonga” and is an umbrella group for other NGOs, particularly representing women’s organizations and the Tonga National Youth Groups; and the Vava’u Environmental Protection Association (VEPA).

6 IMPLEMENTATION ARRANGEMENTS

6.1 RESPONSIBILITY FOR TFSP IMPLEMENTATION

154. A reinforced Fisheries Division would have the primary responsibility for TFSP implementation. A new position at director level (with key support staff) would be established as an implementing unit (TFSP-IU) responsible for management of any incremental funding made available and preparation and oversight of new projects generated under the TFSP. The IU would take measures to ensure coherence and compatibility between the various sources of funding and account for all public resources supporting the sector, including external in-kind support. The TFSP-IU would report on a monthly basis to the Minister and the Fisheries Growth Committee.

155. The fisheries development partners would establish a fisheries working group (FDP-WG) to coordinate inputs provided; cooperate on development of new projects; and provide advisory support and external monitoring. The NFC would have an umbrella role in coordinating private sector activities. Its governance would be representative of the various fisheries associations, including women's groups and of outer island stakeholders. With the backstopping of the TFSP-IU, the NFC and the FDP-WG would engage with a broad-based advisory group (AG) which would help integrate the views and activities of other sectors and ministries, civil society and NGOs into the TFSP implementation process.

6.2 PHASING

156. The implementation would be undertaken in three phases, which may overlap for certain activities:

- a) Phase 1. Preparatory phase would be an initiation phase of at least one year during which (i) Fisheries Division staffing would be reinforced and teams dedicated to specific TFSP tasks would be assigned and their skills improved; (ii) TFSP priorities would be determined in terms of timetable and use of available resources; and (iii) additional internal and external funding, resources and arrangements for priority activities would be arranged
- b) Phase 2 would be the primary implementation phase and extend over an initial period of 3 years with: (i) a major emphasis on capacity building; (ii) preparations would be made for any major infrastructure investments; (iii) the SMA network would be substantially expanded; (iv) the management regimes would be adjusted and secured; (v) the investment regime for aquaculture and value-added activities would be fortified; and (vi) baselines for key indicators would be established
- c) Phase 3 would be based on an evaluation of the progress during Phase 2 (carried out at the end of Phase 2) and would: (i) make relevant adjustments to the TFSP; (ii) continue implementation of priority activities; (iii) undertake major capital investments (subject to feasibility); and (iv) subject to resource availability, extend the scope of the TFSP activities. The long-term indicators (KPIs) would also be adjusted in relation to the more comprehensive quantitative baselines established during Phase 2 and in relation to any adjustments in national and island-level indicators and monitoring schemes.

6.3 MONITORING AND EVALUATION, LESSONS LEARNED, SUSTAINABILITY

157. Monitoring and evaluation. Currently, many of the required baseline values are weak or missing (numbers of fishers, vessels, incomes, fishing effort). A first step in the M&E process would be to prepare and implement a fisheries information and statistics master plan to develop the core social, environmental and economic tracking modules. This would contribute to a dashboard of indicators for the sector with emphasis on the social and economic targets. The second and concurrent step would be to link the dashboard to the performance indicators and deliverables of major fisheries projects and to the milestones of the country's other strategic plans (on climate change, tourism, infrastructure, good governance) and to link the dashboard to the national planning process.

158. Several useful key performance indicators (KPIs) specified in the TNSF II relate to fisheries, including the following KPIs, which may require some review and refinement during the implementation of the TFSP:

- a) fisheries exports as % of GDP. It should be noted that the indicator (as a %) may not reflect the state of fisheries exports if exports in other sectors change substantially.
- b) number of fish species threatened (under Natural Resources). The indicator may be difficult to measure – only the SPC reef assessment provides a regular metric
- c) MPAs as % territorial waters. The indicator does not provide an indication of the success or effectiveness of the conservation measure

- d) % marine area covered by management areas. Again the indicator may not reflect success, or impact
- e) number of villages with Emergency Risk Management Plan. It will be useful to ensure that fisheries components are included
- f) number of responded marine pollution activities. The indicator could be either positive or negative suggesting either more incidents, or improved responses
- g) under political institutions – crime rate. The level of fisheries violations and successfully concluded cases may be a useful metric.

159. The indicators provided in the Results Framework (Table 1) focus largely on maintaining the economic and social integrity of the sector by targeting a halt or reversal in the current declines rather than a more ambitious expansion of the sector, given the fragile state of many of the resources. Many of the indicators relate directly to the HIES survey information (employment, income, food security/ consumption) which will need to be supplemented with additional baseline information (e.g. on vessel numbers and related frame surveys). Export and balance of trade information would be derived from customs data for which improvement in the coding will be required to ensure consistency with other data sources (e.g. Fisheries Division).

160. Lessons learned. The TFSP implementation process draws on a number of lessons. These include: (i) the need to move from robust science to measurable economic, social and environmental benefits; (ii) the need to build a foundation of sustainable institutions, businesses and human capacity prior to major reforms and investments; (iii) social change and reforms (such as for marine tenure) require an extended time horizon, a high degree of flexibility, continuous support for progressive capacity-building and repeat financing to maximize impact, learning and sustainability; (iv) a phased approach is advisable with clear milestones triggering subsequent phases; (v) embedding a broad-based consultative processes both for the design and implementation facilitates adaptive management creates flexibility and builds consensus and inclusion; (vi) particular attention is needed to ensure that the voice of disadvantaged stakeholders is heard; (vii) timely reporting to development partners enables adjustment to targeting and financing.

161. Sustainability. Social, economic and environmental sustainability are fundamental objectives of the TFSP. These complementary dimensions of sustainability would be addressed through core capacity building at all levels linked to policies aligned to provide incentives for sustainable use and benefit sharing. Progress would be informed by the dashboard of indicators and transparency in concessions and licensing. Feedback through participatory processes would guide adaptive management to respond to changing economic, social and environmental conditions. The focus on building leadership for improved sustainability⁹⁴ would help align program activities around a consensus vision, prioritize and sequence investments and establish a framework for progressive realization of higher level objectives. The social dimensions would be tracked (incomes, Gini ratios for target communities, fish food security, gender participation) and would inform the balance between social and economic objectives. A successful SMA model is capable of replication and exchanges of experiences would foster adoption of best practices.

6.4 RISKS AND THEIR MITIGATION

162. Inadequate funding and staffing constitutes a significant risk to the TFSP, which requires a clear commitment to revitalise the fisheries administration to its former capacity. Without this commitment, partners may be reluctant to provide the necessary development assistance. The TFSP is phased to mitigate the resourcing risks, allowing further prioritisation in the Preparatory phase in relation to the available resources and funding commitments. In the event that the resource commitments fall short of those proposed in the TFSP, priority would be given to the co-management of the coastal and community fisheries, including the improvement of the SMA initiative and management of the commercial fisheries with potential for high rents (such as bech-de-mer). Additional efforts would also be made to align TFSP activities with the country strategies of the development partners and to secure inclusion in a wider range of regional projects.

163. There are political risks associated with fisheries reform processes, in particular with tenure and limiting access. These risks would be offset by inclusive discussion across the political spectrum on the options and solutions and provision for any ‘losers’ resulting from change. The weak capacity of the fisheries administration is addressed in Component 4 and in the sequencing of the activities, ensuring that major investments are phased in accordance with the capacity to effectively manage the projects. Some resistance of key public and private sector stakeholders to introduction of reforms is expected and would be addressed through the dialogue and capacity building activities, including (if necessary) study tours to experience success

⁹⁴ Gutierrez, Hilborn, Defeo. 2011. Leadership, social capital and incentives promote successful fisheries. *Nature*, 470, 17 Feb 2011.

stories in fisheries management. The difficulty in developing viable and functional production and value chain models at different levels is recognised and would be addressed through incentives for private sector innovation.

164. There are numerous risk factors outside the scope of the fisheries sector. These include natural disasters, market changes, and changing environmental conditions. Mainstreaming of fisheries into disaster risk management and building economically robust fisheries are among the strategies to address these risks.

7 INDICATIVE BUDGET AND TIMETABLE

165. The estimated costs of the priority investments and activities are provided for the three phases of the TFSP. These are indicative costs subject to substantial revision, particularly for Phases 2 and 3. Implementation of Phase 1 of the TFSP, the Preparatory phase would include the following broad activities:

- a) preparation and implementation of the fisheries administration staff development program to build an effective implementing mechanism for the TFSP
- b) prioritisation of the government fisheries budget and sector funding, and alignment of existing and pipeline funding
- c) dialogue with development partners to identify medium to long-term engagements which could be supported through development assistance
- d) broad-based stakeholder dialogue on the TFSP with particular reference to immediate practical and realisable steps and initiation of discussions on key policy issues, such as limiting access
- e) capacity building and resourcing for the community fisheries development team to (i) review the lessons from establishment of existing SMAs and chart a process of improvement; (ii) support the next phase of SMA development
- f) preliminary studies and discussions in support of the fisheries port infrastructure in Nukualofa
- g) advancement of the tuna, deepwater snapper and beche-de-mer management plans as outlined above
- h) development of an aquaculture investment policy and associated support

166. Phase 2 would build on the foundation laid during Phase 1, during which a detailed implementation plan would be prepared in accordance with the resources secured for the TFSP (i.e., funding of priorities projects and activities). Phase 2 requires that the high level implementation or operations unit of the fisheries administration is adequately staffed and that the community fisheries units are operational. This Phase will establish key baseline metrics including continuous assessment of the SMA performance and adaptive management as part of any expansion of the SMA network and building of fisher associations. Development of the sustainable beche-de-mer scheme and dialogues on limiting effort in the coastal fisheries will be key targets for this phase, in addition to completion of the aquaculture investment policy and adjustment and improved implementation of the various fisheries management plans.

167. Phase 3 would adjust the TFSP taking account of island development plans and emerging issues and opportunities. Subject to the feasibility studies it would seek funding for the major investments, such as the Nuku'alofa fishing harbour. Key decisions on tenure and fishing rights would be expected as a basis for implementation of several fisheries management plans.

168. The total estimated costs are as follows (see Table 2, Table 3; and

169. Detailed cost estimates for TFSP

170. **Table 23** for a detailed breakdown of the estimates):

- a) The total estimated funding required for Phase 1 (preparatory phase) is US\$ 2.3 million, of which an estimated US\$ 1.2 million (55%) can be considered investment costs, while just over US\$ 1 million is provided by an increased GoT recurrent budget (+10%). Approximately 35% of the investment costs would be provided by the GoT (US\$0.43 million); 5% would be provided by the private sector both in cash and kind; and the balance sourced externally (some activities are already funded⁹⁵). The limited capacity of Tonga's treasury to finance new investments is recognised and this phase is largely intended as a means to prepare a pipeline of investments co-financed with development partners. Financing of the subsequent phases is largely contingent on arrangements made in this initial phase⁹⁶.
- b) Phase 2 incremental costs are estimated at US\$ 5 million over three years with similar GoT annual contributions (US\$ 0.4 million) and the balance provided by the private sector and development partners.

⁹⁵ The precise funding gap cannot be assessed without a consolidated accounting for external support and inclusion of activities funded through non-fisheries projects.

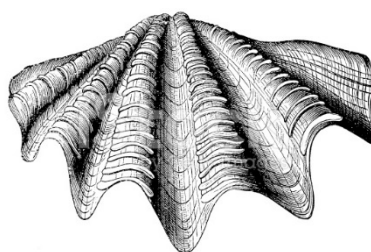
⁹⁶ The proposed TFSP implies an increase of over 50% in the current GoT funding of the sector.

- c) Phase 3 incremental costs are estimated at US\$ 19 million over five years which includes a substantial infrastructure provision for upgrading of the Tu'imatamoana fisheries quay and has a similar level of annual GoT contributions.

171. The TFSP would be financed from internal sources (mainly the Government of Tonga), regional sources (such as regional projects) and external sources (development partners). The indicative budget primarily addresses the public sector financing. In addition to the public sector financing from the Govt. of Tonga, the Tongan sources of finance include private sector investments in harvesting operations (fishing and aquaculture), processing and marketing and support services (such as vessel maintenance and repair, ice, bait and seed production, fish transport). Credits, or loan guarantees made available by the government to the Tonga Development Bank can support private investment. The MAFFF recurrent and investment budgets are essential sources of finance and an increase in these budgets will be an important indicator of political will and prioritisation of the fisheries sector. A range of other sources of support could be developed through liaison with other ministries, NGOs and church groups. The private sector support for the initial phase would be largely in kind through participation in working groups and committees, participation in leadership training and administration of fisheries associations and council.

172. Key development partners include Australia (DFAT), New Zealand, Japan (JICA), ADB and the EC. The World Bank is implementing a Pacific Islands Fisheries Engagement Strategy, while IFAD has a mandate to target the poorer communities, many of which are isolated fishing communities. Use of a range of World Bank funding opportunities, such as the Global Agriculture and Food Security Program (GAFSP), can also be explored. The Strategic Program for Climate Resilience (6 SMAs in Vava'u), SeaEcology, USA, the Khalid bin Sultan Living Oceans Foundation and UNDP/GEF are also engaged in supporting Tonga's efforts. At the regional level SPC, FFA and FAO are expected to continue to provide vital technical support and advice. Opportunities also exist to engage major conservation NGOs such as Rare, WWF, Packard Foundation, IUCN and Conservation International. A tabular summary of current development projects is provided in the annex.

173. Many of the development partner's country strategies contain activities which can contribute to the TFSP. All of the major OECD DAC donors (Australia 37%, New Zealand 24%, and Japan 17%) have had engagement in fisheries. Under its ongoing multisector strategy, the ADB⁹⁷ aims to establish a pool of climate change expertise, a climate change trust and contribute to climate resilient infrastructure. An IMF consultation recognises the importance of sector support through the TDB and improvement of the investment climate for FDI, both of which are directly relevant to development of commercial aquaculture and tuna processing. Development, while and IMF/ WB team recognised the potential of fisheries for private investment⁹⁸. New Zealand's MFAT is engaged in an ongoing dialogue on potential support to the fisheries sector, but as with several potential partners, seeks a clear indication of commitment to sustainable fisheries and corresponding resourcing by the government. The agreed priority areas⁹⁹ include tourism, private sector development and targeted budget support for economic policy making, all of which can support sustainable fisheries initiatives. Australia's interest in gender issues and education may complement capacity development in women's groups and awareness raising in schools, its commitment¹⁰⁰ to climate change adaptation, community development and health align with the focus on community fisheries and food security, and Australia's support to regional fisheries activities provide crucial technical support.



⁹⁷ ADB, 2013.

⁹⁸ IMF, 2014.

⁹⁹ Tonga – New Zealand Joint commitment for development. 2011.

¹⁰⁰ Partnership for Development between the Govt. of Australia and the Govt. of Tonga, 2009.

8 ATTACHMENTS

8.1 RESULTS FRAMEWORK

Table 1. Results framework

| Objectives/ Goals/ Inputs | Targets* | Indicators | Assumptions |
|---|---|--|--|
| <p>Objective: To increase the sustainable shared benefits for Tonga from optimal use of the living marine resources</p> | <ul style="list-style-type: none"> • maintained (i.e. decline reversed) • availability of food fish maintained • net export earnings increased • sustainable seas | <ul style="list-style-type: none"> • statistics, HIES • household consumption studies • customs reports • state of environment reports | <p><i>[External: no major oceanographic changes or natural disasters]</i></p> |
| <p>Components/ Outcomes/ Goals</p> | | | |
| <p>C.1. Sustainable community fisheries [baselines are required for most indicators: HIES and nutrition surveys can provide some]</p> | <ul style="list-style-type: none"> • incomes: fisher household net incomes stable or increased • reduction in out-migration compared to non-SMA communities, • fisheries employment maintained • (fish) food security maintained • climate resilience enhanced | <ul style="list-style-type: none"> • HIES • vessel/ fisher registries • fisher association reports • SMA reports • climate projects reports on adoption of adaptation strategies; overall poverty reduction | <ul style="list-style-type: none"> • general community acceptance of (equitable) arrangements to restrict effort and access |
| <p>C.2. Sustainable and profitable commercial fisheries and aquaculture</p> | <ul style="list-style-type: none"> • employment increased (baseline required) • enterprise profits and productivity added increased • exports/ value added increased • govt. revenue increased • productivity in major fisheries (decline in CPUE reversed) | <ul style="list-style-type: none"> • HIES, customs, GDP estimates, fishing industry monitoring: MEY tracking, catch and effort trends in commercial fisheries , enterprise surveys • aquaculture and cold store/ processing investment approvals | <ul style="list-style-type: none"> • cooperation and compliance by industry • effective co-management and leadership • export market conditions remain favourable • airfreight capacity expended |

The Kingdom of Tonga: Tonga Fisheries Sector Plan

| Objectives/ Goals/ Inputs | Targets* | Indicators | Assumptions |
|---------------------------------------|--|---|---|
| C.3. Public and private investment | <ul style="list-style-type: none"> development, port(s) financing arrangements, energy efficiency, sustainable aquaculture support | <ul style="list-style-type: none"> Authority, maintenance budgets, asset inventory Bank Port Tonga Dev. | <ul style="list-style-type: none"> a priority in the NIIP/ favourable cost benefit fishing port |
| C.4. Governance and capacity building | <ul style="list-style-type: none"> fisheries policy national | <ul style="list-style-type: none"> reports industry practise FMC codes of | <ul style="list-style-type: none"> |

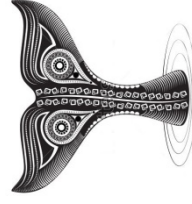
| Outputs | Targets* | Indicators | Assumptions |
|--|---|--|--|
| C.1. Sustainable community fisheries | <ul style="list-style-type: none"> SMA best practices in expansion of local fisher co-management leaders SMA network associations make and apply rules framework adjusted identified and trained | <ul style="list-style-type: none"> review of SMA performance independent bye-law approvals increased delegation in law and applied in practice (ministerial orders) | <ul style="list-style-type: none"> willingness to delegate authority to community level political successful SMA models can be readily replicated and adopted |
| C.2. Sustainable and profitable commercial fisheries and aquaculture | <ul style="list-style-type: none"> perverse incentives of (adjusted) management plans mainstreamed into climate change agenda elimination of fisheries implementation of management plans fisheries | <ul style="list-style-type: none"> scientific advice (license numbers, concessions) adherence to level (MCS reports) delinquency stock assessments, CPUE | <ul style="list-style-type: none"> willingness to sustainable fisheries political |

The Kingdom of Tonga: Tonga Fisheries Sector Plan

| Objectives/ Goals/ Inputs | Targets* | Indicators | Assumptions |
|--|---|---|--|
| C.3. Public and private investment | <ul style="list-style-type: none"> fishing port operations improved investments financed handling/ storage Sopu facilities upgraded | <ul style="list-style-type: none"> reports agreements (public and private) operational | <ul style="list-style-type: none"> sector makes timely payments for services and leases private |
| C.4. Governance and capacity building | <ul style="list-style-type: none"> Nukualofa port processing/ Sopu facilities TFSP and project management teams aligned medium-term development assistance support | <ul style="list-style-type: none"> development assistance coordination group reports of | <ul style="list-style-type: none"> available in country and region skills fishers formally establish associations |
| Inputs | | | |
| C.1. Sustainable community fisheries | <ul style="list-style-type: none"> strengthening of community fisheries team SMA best practices development and implementation of SMA expansion training of fisheries associations awareness programme (schools/ public) | <ul style="list-style-type: none"> Div. budgets practices handbook and evaluation reports of training courses monitoring reports school curriculum materials, radio, drama, other | <ul style="list-style-type: none"> Fisheries best SMA primary engagement and contributions by communities political commitment to effort/ access control in coastal fisheries |
| C.2. Sustainable and profitable commercial fisheries and aquaculture | <ul style="list-style-type: none"> management plans revised and updated with priority activities implemented investment policy and support earnings/ value chain studies | <ul style="list-style-type: none"> records of FMC and fisheries association meetings investment policy published/ disseminated | <ul style="list-style-type: none"> political commitment to incentive-based fisheries management |

| Objectives/ Goals/ Inputs | Targets* | Indicators | Assumptions |
|---------------------------------------|---|--|--|
| C.3. Public and private investment | <ul style="list-style-type: none"> • financing arrangements • construction | <ul style="list-style-type: none"> • study reports • engineering reports • proposals | <ul style="list-style-type: none"> • investments are viable • sector credit available |
| C.4. Governance and capacity building | <ul style="list-style-type: none"> • increase in studies and execution / • Fisheries Div. staffing and operations budget TFSP/ project • management • Fish. Div. reports • assistance • training programmes | <ul style="list-style-type: none"> • Fish. Div. budgets • programme/ project reports • Country assistance programs • Fish. Div. web site | <ul style="list-style-type: none"> • political commitment to TFSP implementation, including financing and reforms |

* Baselines and target values and timescales to be determined. In many cases the target values already exist in the HIES, or export statistics



8.2 SUMMARY ESTIMATE OF COSTS AND TIME/TABLE

Table 2. Summary estimate for TFSP, Phases 1, 2 and 3 (US\$'000)

| Phase Year | Phase 1 | | | Phase 2 | | | Phase 3 | |
|--|--------------|--------------|--------------|--------------|---------------|---|---------|---|
| | 1 | 2 | 3 | 4 | 5-9 | 1 | 2 | 3 |
| Current budget allocation (to be maintained) | 900 | 900 | 900 | 900 | 4500 | | | |
| <i>Special incremental allocation for asset maintenance (+20% of existing allocation)</i> | 84 | 84 | 84 | 84 | 420 | | | |
| <i>Special incremental allocation for upgrading to Ministry (+7% of existing allocation)</i> | 63 | 63 | 63 | 63 | 315 | | | |
| TOTAL ADJUSTED RECURRENT | 1,047 | 1,047 | 1,047 | 1,047 | 5,235 | | | |
| Estimated incremental budget (additional for TFSP) | | | | | | | | |
| Component 1. Sustainable Community Fisheries | 460.1 | 463 | 474 | 418 | 1,913 | | | |
| <i>Sub-component 1.1. Enhancement of the SMA Programme</i> | 266 | 240 | 234 | 228 | 1098 | | | |
| <i>Sub-component 1.2. Expansion of the SMA Network</i> | 154 | 123 | 150 | 120 | 775 | | | |
| <i>Sub-component 1.3. Management and development of coastal fisheries</i> | 40 | 100 | 90 | 70 | 40 | | | |
| Component 2. Economic development of commercial fisheries and aquaculture | 315 | 790 | 275 | 560 | 1030 | | | |
| <i>Sub-component 2.1. Management of commercial fisheries</i> | 150 | 190 | 150 | 150 | 750 | | | |
| <i>Sub-component 2.2. Economic development of commercial fisheries and aquaculture</i> | 165 | 600 | 125 | 410 | 280 | | | |
| Component 3. Public and private investment | 55 | 302 | 110 | 125 | 10,000 | | | |
| <i>Sub-component 3.1. Preparation of public investment in infrastructure</i> | 25 | 62 | 5 | 0 | 0 | | | |
| <i>Sub-component 3.2. Implementation of infrastructure investment projects</i> | 30 | 20 | 75 | 125 | 10,000 | | | |
| <i>Sub-component 3.3. Special assistance for export fisheries</i> | | 220 | 30 | | | | | |
| Component 4. Good governance and capacity building | 265 | 179 | 209 | 179 | 785 | | | |
| <i>Sub-component 4.1. Capacity building in the fisheries administration</i> | 115 | 115 | 135 | 115 | 575 | | | |
| <i>Sub-component 4.2. Coordination and support for stakeholder capacity building</i> | 15 | 5 | 15 | 5 | 45 | | | |
| <i>Sub-component 4.3. Policy reform processes</i> | 135 | 59 | 59 | 59 | 165 | | | |
| TOTAL INCREMENTAL ESTIMATE | 1,216 | 2,301 | 1,103 | 1,652 | 13,943 | | | |
| TOTAL WITH INCLUSION OF CURRENT GoT EXPENDITURE | 2,263 | 3,348 | 2,150 | 2,699 | 19,178 | | | |

Table 3. Budget estimate by financing modality and phase

| Phase Year (estimates in US\$'000) | Phase 1 | | | Phase 2 | | | Phase 3 | |
|--|--------------|--------------|--------------|--------------|---------------|---|---------|---|
| | 1 | 2 | 3 | 4 | 5-9 | 1 | 2 | 3 |
| 1. Total estimated GoT budgetary requirement (2+3) of which: | 1,477 | 1,461 | 1,432 | 1,396 | 6,926 | | | |
| 2. Adjusted current GoT recurrent expenditure estimate | 1,047 | 1,047 | 1,047 | 1,047 | 5,235 | | | |
| 3. GoT incremental TFSP estimate | 430 | 414 | 385 | 349 | 1,691 | | | |
| 4. External support required (financing gap) | 786 | 1,887 | 718 | 1,303 | 12,252 | | | |
| 5. Total incremental TFSP estimate (3+4) | 1,216 | 2,301 | 1,103 | 1,652 | 13,943 | | | |
| TOTAL TFSP estimate (2+5) | 2,263 | 3,348 | 2,150 | 2,699 | 19,178 | | | |

Table 4. Indicative timetable and sources of funding

| | Components/ activities | Phase 1 (preparatory) 1 year | Phase 2 3 years | Phase 3 5 years | Internal funding | External funding | Notes |
|-----------|---|------------------------------------|--------------------|--------------------|---------------------|---------------------|---|
| 1. | C.1. Sustainable coastal fisheries | | | | | | |
| 1.1. | Personnel (incremental) annual cost (see C.4.) | x | x | x | x | | All Govt. personnel under C.4. |
| 1.2. | Equipment | x | x | | | x | project linked, i.e. requires dev. project |
| 1.3. | Operations annual cost (incremental) | x | x | x | x | x | project linked |
| 1.4. | Awareness and national dialogue | x | x | | x | x | project linked |
| 1.5. | Monitoring | x | x | x | x | x | project linked |
| 1.6. | Studies | x | x | | x | x | project linked |
| 1.7. | Technical assistance (specific coastal fisheries) | x | x | x | x | x | project linked/ FD provides office support |
| 1.8. | Expansion of SMAs | x | x | x | x | x | already financed for Preparatory phase |
| 1.9. | Small grants to associations/ communities | x | | | | x | trials/ development of system/ criteria |
| 2. | C.2. Profitable commercial fisheries and aquaculture | | | | | | |
| 2.1. | Technical assistance on mgt. plans | x | | | x | x | mainly external project |
| 2.2. | Economic monitoring and analysis | x | x | x | x | | \$ for ops, see Personnel under C.4. |
| 2.3. | Co-management operations/ dialogues | x | x | x | x | x | meetings, awareness, internal travel |
| 2.4. | SME services (FD and other) incl. credit access | x | x | x | x | | \$ for ops; review of existing operations |
| 2.5. | Aquaculture investment policy and initiative | x | | | | | ta, meetings, drafts |
| 2.6. | Regional economic cooperation on longlining | x | | | x | | studies, legal drafts, meetings |
| 2.7. | Enhanced international obligations on tuna | x | x | x | x | | recurrent -internal, investment - external |
| 3. | C.3. Public and private infrastructure | | | | | | |
| 3.1. | Economic & design studies and scoping of finance | x | | | | x | incl. mgt. and financing modalities |
| 3.2. | Detailed engineering studies | | x | | | x | contingent on above (min. \$0.4 million) |
| 3.3. | Construction of port infrastructure | | | x | | x | contingent on above (min. \$10-15m) |
| 3.4. | Monitoring/ review of performance of existing PPPs | | | | x | | FMC market infra. |
| 3.5. | Major repair/ upgrading of Sopa facilities | | x | x | x | x | * subject to assessment (min. \$0.75 million) |
| 4. | C.4. Governance and capacity building | | | | | | |
| 4.1. | Personnel (incremental) annual cost | x | x | x | x | | annual cost +25% inc. in personnel budget |
| 4.2. | Main technical assistance package | x | x | | | x | from development partners |
| 4.3. | Human resource development planning, financing | x | | | | x | needs assessment, prioritisation |
| 4.4. | Human resource development activities | x | x | x | x | x | leadership, Fish Div. staff dev. Program |
| 4.5. | High-level policy/ co-management/ TFSP oversight | x | x | x | x | | TFSP oversight committee |

9 ANNEX. SUPPLEMENTARY BACKGROUND INFORMATION

9.1 EXISTING DEVELOPMENT ASSISTANCE PROJECTS

Table 5. Existing development assistance projects

| Project Name | Development partner(s) | Project cost*s | Status | Comments |
|--|--------------------------|----------------|---|---|
| Fisheries Export Development Fund | PDF & Government Fund | \$300,000 | Project approved CD 53 dated 31 Jan 2014. | Management committee established to screen the applicants. Transferred to Tonga Development Bank |
| Development of Small Fisheries Project | PDF | T\$180,174 | Approved by CD 437, 10/5/2013 | Objective: To develop the small scale fisheries in Tonga in order to continue provision of healthy food supply and consistently generate income for fishermen household. T\$100,000 transferred to Fisheries Export Development Fund. Not yet implemented. |
| Climate Resilience Sector (Establish of 6 SMA in Vava'u) | ADB | USD1,085,653 | Official signed the project agreement. | Expecting to be implemented in 2014. Objectives: Eco-system Resilience and Climate Infrastructure Investments, Increased ability of coral reefs to recover after climate related events. Awaiting implementation. |
| Strategic Program for Climate Resilience for the Kingdom of Tonga | Climate Investment Funds | US\$1,000,000 | Approved PPCR/SC.10/6 (2012) | Ecosystem-based climate resilient fisheries/agriculture/protected areas management in pilot vulnerable communities. Implementation status to be confirmed. |
| Observer and Debriefing training for Tonga National Observer Programme | Japan Trust Fund (JTF) | T\$6,682 | Ongoing & renew | Objectives: Capacity building, To conduct an observer refresher workshop for national Observer and to Complete part B of the debriefing training for national trainees. |
| Port Sampling | Japan Trust Fund (JTF) | T\$14,926 | On going | Tuna Data collection Objectives: improve quality data collection for tuna stock assessment, comply with WCPFC obligations. Annual project base on submission to the WCPFC |
| Snapper Stock Assessment – Biological sampling | SPC | T\$11,760.33 | Ongoing | Snapper data collection. Objectives: improve quality data collection for snapper stock assessment. |
| Observer Scheme Coordinator | FFA | T\$132,453.00 | Ongoing; | Deployment of national observer at US Fishing vessels under the multilateral Treaty. Objectives: employment opportunities and improve quality data collection for stock assessment. |

| Project Name | Development partner(s) | Project cost**s | Status | Comments |
|---|-----------------------------------|---------------------|---------------------|---|
| Pearl industry development in the Western Pacific | ACIAR | AUS\$1,154,050 | Ongoing | 4 years project for Tonga, Fiji, PNG. Currently in progress with also continuous of hatchery run to supply spat for the farmers with more than 1.3 million settlement spats deployed in December plus two more hatchery run propose early 2014 during summer season. Training for pearl seedling and pearl culture activities still in-hand. Objective: Develop more effective hatchery production methods for Petria penguin and to enhance development of the cultured pearl industries in Fiji & Tonga. |
| Development of community –based milkfish farming in Nomuka and Tongatapu | FAO | USD231,000 | On going | Finfish culture currently in-progress but focused on milkfish and tilapia which will be conducted at Nomuka Lake and Fanga'uta for pen culture system whereas Sopus will be used for pond culture system. This project will be also conducted trail by using local feed material (i.e. plant productions as sources of protein) as for fish feed pellet. Training for fish farm management (i.e. pond and fishpen culture system) and milkfish fry collection already done for both Nomuka communities and Tongatapu community but will be more training in the future during the project activities. |
| Evaluating the impacts of improving postharvest processing of sea cucumbers in the Western Pacific Region | ACIAR | AUS\$100,090 | Project signed 2013 | 4 years project for Kiribati, Fiji, Tonga. Objectives: Improve the income of village fishers in Kiribati, Tonga and Fiji through support to improve the quality of post-harvest processing of sea cucumber. |
| National Consultation on establish of National Fisheries Council | DEV Fish II | AUD 2,180.22 | On going | Part of that fund used for assessment of Ian damaged to Fisheries |
| FAD deployment for Eua (6 FADs) | SPC/Dev Fish2 | USD10,000 | On going | Objective: Nearshore FADs to provide food security and livelihoods and shift effort from reef to the ocean. SPC order the FAD materials and transport them to Tonga for construction the FAD. |
| SMA's 'Atata, Ovaka and Felemea. | GEF Small Grants Programme (UNDP) | US\$48,000 per SMA. | On going | Alternative livelihood, policing & enforcement of SMA, Training, restocking. Objectives: To strengthen their SMA management capacity and continue to enhance conservation and sustainable use of their coastal marine resources. |
| Tonga Business Enterprise Centre | NZ Aid | | On going | Wide range of training course suitable for fisheries SMEs |

| Project Name | Development partner(s) | Project cost**s | Status | Comments |
|----------------------|------------------------|-----------------|------------------------|---|
| TRIP | IFAD | | | Focused on isolated rural communities and a useful model for implementation of some community fisheries activities |
| MACBIO | IUCN | Approx. USD1M | Initial study complete | Regional marine ecosystem valuation project (executed by Department of Environment) |
| GEF Fanga'atu Lagoon | UNDP | USD1.7M | | The project is not directly related to fisheries, but improvements in the health of the lagoon could contribute to fish production. (executed by Department of Environment) |

Source: Fisheries Division. * Cost for regional projects may include allocations for other countries.

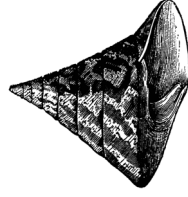
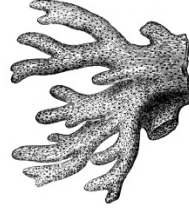


Table 6. Potential partners in relation to the TFSP components

| TFSP Component | Possible partners |
|--|---|
| 1. Sustainable community fisheries | <ul style="list-style-type: none"> • IFAD, ADB, WB TFs • Climate Funds (GEF & PPCR, Adaptation Fund) • Rare, WWF, IUCN, Khalid bin Sultan, SeaEcology, Packard Foundation • Peace Corps, UNV, AusAid volunteers |
| 2. Sustainable and profitable commercial fisheries and aquaculture | <ul style="list-style-type: none"> • World Bank • IFC (port/ processing) • NZ Aid, Japan (JICA, JTF) • China, Korea, ACIAR (aquaculture), WorldFish (aquaculture, food security) |
| 3. Climate sensitive productive and sustainable infrastructure | <ul style="list-style-type: none"> • WB, JICA (port) |
| 4. Governance and capacity building | <ul style="list-style-type: none"> • SPC, FFA, FAO, USP, • NZ Aid, AusAid, EC • Regional initiatives and organisations: FFA, SPC, SPREP |



9.2 POLICIES

The following box shows the alignment between the TFSP components and the Government's Vision statement.

| <i>Box 3. TFSP components and Government's Vision by Outcome Objectives 1-9:</i> |
|--|
| <p>Sustainable community fisheries</p> <p>1. Strong inclusive communities, by engaging districts/villages/communities in meeting their prioritised service needs and ensuring equitable distribution of development benefits.</p> <p>7. [Cultural awareness,] environmental sustainability, disaster risk management and climate change adaptation, integrated into all planning and implementation of programmes</p> <p>Sustainable commercial fisheries</p> <p>2. Dynamic public and private sector partnership as the engine of growth, by promoting better collaboration between government and business, appropriate incentives and streamlining of rules and regulations. (through NFC, SMAs, fisher and exporter associations, development of an aquaculture investment policy, adaptive management of fisheries)</p> <p>9. Safe, secure and stable society, by maintaining law and order. (activities on compliance, safety at sea and)</p> <p>Public and private investment</p> <p>3. Appropriate, well planned and maintained infrastructure that improves the everyday lives of the people and lowers the cost of business, by the adequate funding and implementation of the National Infrastructure Investment Plan (NIIP).</p> <p>Improved fisheries governance</p> <p>8. Better governance, by adopting the qualities of good governance, accountability, transparency, anti-corruption and rule of law.</p> <p>Capacity development</p> <p>4. Sound education standards, by emphasising quality universal basic education.</p> <p>5. Appropriately skilled workforce to meet the available opportunities in Tonga and overseas, by delivering improved Technical and Vocational Education and Training.</p> <p>6. Improved health of the people, by promoting healthy lifestyle choices with particular focus on addressing non-communicable diseases, and providing quality, effective and sustainable health services. (activities on fish quality and fish in nutrition)</p> |

The clearest articulation of the government's policies and development strategies in fisheries is found in the goals of the Fisheries Division Strategic Plan 2007-2011. Those are:

- Goal 1: Improve fisheries investments through 15 percent fleet development for longline fisheries and promotion of sub-regional access agreements.
- Goal 2: Strengthen and develop aquaculture through promotion of commercial farming for export and supporting coastal community development through stock enhancement.
- Goal 3: Increase employment opportunities equivalent to at least 10 percent of current level of employment, through training and development of fisheries skills in the fisheries industry.
- Goal 4: Improve fisheries information and catch data on resource status through strengthening of existing data management framework and reporting process.
- Goal 5: Strengthen existing, and explore new, fisheries markets.
- Goal 6: Increase production by 15 percent through opening of closed fisheries, research new fisheries, and scientific monitoring of existing fisheries in order to better target fishing effort.
- Goal 7: Improve fisheries governance through increased participation of fisheries stakeholders in fisheries management and in the decision making process.
- Goal 8: Continue to support Community Based Management capacity building, enforcement capability, and expansion of Special Management Areas for sustainable food supply.
- Goal 9: Promote the creation of integrated programs and income generating opportunities for coastal communities.
- Goal 10: Continue to strengthen the integrated approach to coastal fisheries management and development through close working partnerships and coordination with relevant agencies.
- Goal 11: Match national fisheries management and development with on-going regional and international fisheries development.

- Goal 12: Continue strengthening fisheries compliance through capacity building.
- Goal 13: Continue strengthening organizational capacity and capability.

9.3 MAFFF STAFFING AND BUDGET

Table 7. Ministry of Fisheries senior staffing in 1999

| Ministry of Fisheries senior staffing in 1999 | number |
|---|--------|
| Postgraduate Degrees in Science and Economics | 3 |
| Postgraduate Diplomas in Science | 1 |
| Bachelor's Degrees in Science and Arts | 3 |
| Diplomas in Management and Science | 6 |
| Technical Certificates in Science, Trade and Management | 15 |
| Total – 85 total staff | 28 |

Table 8. Fisheries expenditure by major component

| | 2013/14 (T\$) | 2014/15 (T\$) |
|--|---------------|---------------|
| Established staff | 1,108,053 | 1,045,975 |
| Un-established staff | 12,000 | 38,609 |
| Travel and Communication | 114,860 | 137,300 |
| Maintenance and Operations | 242,742 | 180,042 |
| Purchase of Goods and Services | 285,650 | 264,350 |
| Operational Grants & Capital Expenditure | 50001 | 83546 |
| Total | 1,813,306 | 1,749,821 |

| Fisheries Division Budget 2014 | US\$'000 | % |
|--------------------------------------|----------|-----|
| Administration and outer islands | 199 | 22% |
| Monitoring, Control and Surveillance | 162 | 18% |
| Aquaculture | 108 | 12% |
| Budget & finance | 97 | 11% |
| Marketing | 80 | 9% |
| Assets & engineering | 72 | 8% |
| Information technology | 69 | 8% |
| Community fisheries | 41 | 5% |
| Offshore fisheries | 39 | 4% |
| Inshore fisheries | 23 | 3% |
| Economics | 18 | 2% |
| Total: | 907 | |

Box 4. Considerations regarding the possible (re)establishment of a Ministry of Fisheries

The National Strategic Framework has given priority to fisheries as a key sector. However, its status as a division within MAFFF and its current resources are inadequate to fulfil the vision for the sector, to meet the challenges and fulfil Tonga's obligations under international laws and treaties.

1. The **performance** of the sector has declined substantially since the former Ministry of Fisheries was integrated with Agriculture. Its share of exports and GDP has declined markedly. While market conditions and climatic conditions have contributed to some of the decline, the downgrading of the fisheries administration has also been a significant contributing factor.
2. **False economies.** The ministries of agriculture and fisheries were amalgamated based on assumption of increased efficiency and savings. However, in practice it has meant a contraction of the fisheries administration from 80 to 50 active staff with less efficient and longer communications chains and procedures. Overworked fisheries staff has become demoralised and lack a career path in agriculture.

Frustrated professionals have been recruited by regional fisheries agencies or moved from the sector, resulting in a further decline in services and sector performance.

3. **Different stakeholders.** While most fisher households in rural communities also engage in agriculture, the commercial fisheries involve an entirely different set of stakeholders. The fisheries administration also prioritises interactions with different government agencies: tourism, marine transport and port authorities and has different legal and international relations agendas. There are also important differences in the climate change and environmental agendas which get lost in a consolidated (MAFFF) approach.

4. **Private sector demand.** The private sector has suffered as a result of the downgrading of the fisheries administration and for years has demanded improved services and a higher profile for fisheries.

5. **International obligations.** Tonga is severely challenged to effectively meet its international obligations in fisheries. This includes activities under numerous treaties and regional agreements: Forum Fisheries Agency; South Pacific Commission; Western Central Pacific Fisheries Commission; Niue Treaty; US Multilateral Treaty; Te Vaka Moana; Polynesian Leaders Group; and requirements under the Law of the Sea instruments, including the UN Fish Stocks Agreement and the Compliance Agreement.

6. **Different problems and approaches.** Fisheries deals largely with common property resources (fish), while agriculture deals largely with private property (land). Issues such as tenure, producer cooperation, community decision-making and Special dynamic ...

7. **Lack of knowledge and interest.** Fisheries staff faces a lack of knowledge of fisheries technical, policy and management issues among the centralised MAFFF workforce, who often have little interest in fisheries issues. As a result important policy and resourcing issues get 'bundled' with agriculture and effectively become lost in budget allocations and implementation arrangements.

8. **Un-necessarily lengthy and inefficient communications and approvals processes.** Planning, budgeting, expenditure and administrative approvals can take up to several days longer under the consolidated MAFFF compared to when fisheries was a separate ministry. This can have significant consequences in an industry dealing with highly perishable products, where export clearances are time sensitive and where fishing trips are dependent on weather, tides and phases of the moon.

9. **Specialised services** are essential to fisheries and the time and effort spent defending against attempts to centralise such services is counterproductive. An example is IT services where the fisheries administration collaborates with other PICs in international databases and tracking of tuna vessels, with respect to information used by national and international enforcement exercises. Other data management services, such as vessel registries and catch records do not have agricultural equivalents.

10. **Insufficient engagement.** The fisheries staff are acutely aware that the division is losing out with regard to inclusion in projects, with regard to financing opportunities and staff training opportunities.

11. **Cost implications.** If a separate ministry is created with a single minister responsible for both the fisheries ministry portfolio and the agriculture ministry portfolio, the financial implications are relatively modest. It will require the creation of a new CEO post and the transfer of some existing staff (back) to fisheries. On the benefit side, a more effective fisheries administration will underpin the recovery of key fisheries, such as beche-de-mer, which historically has provided significant rural incomes and export revenues. It will also serve as a vehicle for implementation of a fisheries sector plan which is currently in preparation with World Bank and IFAD assistance.



9.4 FISHERIES PRODUCTION

Tonga fisheries production (tons)

Table 9. Tonga fisheries production and export value (T\$ 000)

| Values in T\$ 000 | 2003-04 | 2004-05 | 2005-06 | 2006-07 | 2007-08 | 2008-09 | 2009-10 | 2010-11 | 2011-12 | 2012-13 |
|--|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Domestic consumption | | | | | | | | | | |
| Marketed consumption in current prices | 8,826 | 8,828 | 8,830 | 8,832 | 8,834 | 8,836 | 8,134 | 7,660 | 8,273 | 12,327 |
| Non-marketed consumption in current prices | 3,401 | 3,629 | 3,872 | 4,131 | 4,408 | 4,703 | 4,329 | 4,077 | 4,403 | 6,561 |
| Total consumption current prices | 12,227 | 12,457 | 12,702 | 12,963 | 13,241 | 13,538 | 12,462 | 11,737 | 12,676 | 18,887 |
| GVA marketed in current prices | 7,061 | 7,062 | 7,064 | 7,065 | 7,067 | 7,069 | 6,507 | 6,128 | 6,619 | 9,861 |
| GVA non-marketed in current prices | 3,061 | 3,266 | 3,485 | 3,718 | 3,967 | 4,232 | 3,896 | 3,669 | 3,963 | 5,904 |
| Total GVA in current prices | 10,122 | 10,328 | 10,548 | 10,783 | 11,034 | 11,301 | 10,403 | 9,797 | 10,581 | 15,766 |
| Total GVA in 2010-11 prices | 28,397 | 29,652 | 27,360 | 26,383 | 23,007 | 19,699 | 19,781 | 19,862 | 19,944 | 20,027 |
| Exports in current prices | | | | 2,536 | 5,921 | 4,159 | 9,857 | 9,904 | 9,605 | 9,082 |
| Exports value added in current prices | | | | 1,572 | 3,671 | 2,578 | 6,111 | 6,140 | 5,955 | 5,631 |
| Exports value added in 2010-11 prices | | | | 3,156 | 5,449 | 2,409 | 5,390 | 6,140 | 4,236 | 7,351 |
| Seafood value added in current prices | | | | | | | | | | |
| Marketed domestic consumption | 7,061 | 7,062 | 7,064 | 7,065 | 7,067 | 7,069 | 6,507 | 6,128 | 6,619 | 9,861 |
| Marketed exports | | | | 1,572 | 3,671 | 2,578 | 6,111 | 6,140 | 5,955 | 5,631 |
| Non-marketed domestic consumption | 3,061 | 3,266 | 3,485 | 3,718 | 3,967 | 4,232 | 3,896 | 3,669 | 3,963 | 5,904 |
| Total value added in current prices | | | | 12,356 | 14,705 | 13,879 | 16,514 | 15,938 | 16,536 | 21,397 |

Source: GoT, Statistics Dept.



Table 10. Tonga fisheries production as reported by FAO (tons)

| FAO Fishstat | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 |
|-------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| <i>Tuna total</i> | 1161 | 1733 | 1672 | 1013 | 472 | 762 | 955 | 1093 | 729 | 353 | 176 | 292 |
| Yellowfin tuna | 175 | 259 | 263 | 263 | 163 | 219 | 227 | 341 | 291 | 109 | 47 | 171 |
| Albacore | 862 | 1268 | 1189 | 611 | 182 | 283 | 414 | 390 | 220 | 124 | 57 | 34 |
| Bigeye tuna | 120 | 191 | 215 | 94 | 40 | 125 | 117 | 129 | 81 | 38 | 24 | 18 |
| Skipjack tuna | 4 | 15 | 5 | 3 | 3 | 2 | 1 | 1 | 0 | 0 | 0 | 1 |
| Tuna-like fishes nei | - | - | - | 42 | 84 | 133 | 196 | 232 | 137 | 82 | 48 | 68 |
| <i>Billfish total</i> | 134 | 201 | 194 | 113 | 45 | 48 | 70 | 80 | 57 | 41 | 38 | 53 |
| Black marlin | 26 | 39 | 38 | 22 | 9 | 7 | 7 | 4 | 6 | 3 | 2 | 2 |
| Blue marlin | 24 | 36 | 35 | 20 | 8 | 17 | 18 | 27 | 12 | 8 | 6 | 22 |
| Striped marlin | 55 | 82 | 79 | 46 | 18 | 6 | 24 | 18 | 11 | 8 | 4 | 7 |
| Swordfish | 29 | 44 | 42 | 25 | 10 | 18 | 21 | 31 | 28 | 22 | 26 | 22 |
| Shappers, jobfishes nei | ... | ... | ... | ... | ... | 171 | 283 | 180 | 162 | 77 | 182 | 134 |
| Marine fishes nei | 2305 | 2548 | 2612 | 2874 | 668 | 719 | 942 | 1200 | 1100 | 1008 | 1000 | 1001 |
| Marine crustaceans nei | 175 | 270 | 337 | 386 | 400 | 450 | 450 | 500 | 450 | 403 | 401 | 400 |
| Marine molluscs nei | 13 | 22 | 38 | 49 | 60 | 50 | 50 | 50 | 50 | 46 | 42 | 42 |
| Sea cucumbers nei | - | - | - | - | - | - | - | - | 45 | 108 | 311 | 79 |
| Brown seaweeds | 443 | 173 | 407 | 319 | 1707 | 420 | 356 | 107 | 0 0 | 16 | 1 | 104 |
| Total | 4231 | 4947 | 5260 | 4754 | 3352 | 2620 | 3106 | 3210 | 2593 | 2052 | 2151 | 2105 |

Source: FAO Fishstat. Note: Production is substantially under-reported, e.g. Gillett (2009) estimates production at 7,619 tons. See the following sections for more updated information on selected fisheries.



Table 11. Export volumes as reported by FAO (tons)

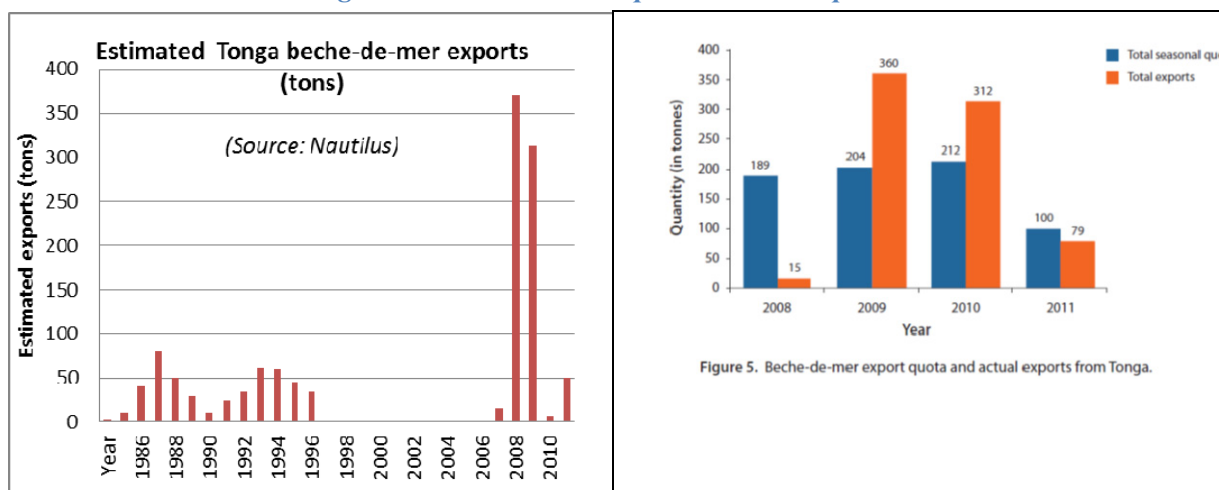
| Commodity (Commodity) | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | Avg |
|---|------|------|------|------|------|------|------|------|------|------|-----|
| Fish, fresh or chilled, nei | 760 | 317 | 1117 | 1374 | 420 | 395 | 646 | 595 | 270 | 106 | 600 |
| Molluscs nei, frozen | 1 | 111 | 35 | 32 | 777 | 718 | 688 | 641 | - | - | 375 |
| Other seaweeds and aquatic plants and products thereof | 91 | ... | 29 | 164 | 1328 | 538 | 298 | 108 | 11 | - | 321 |
| Fish live, nei | 224 | 14 | 667 | 756 | 266 | 64 | 264 | 309 | ... | 0 | 321 |
| Fish, frozen, nei | 1 | 15 | 706 | 228 | 67 | 150 | 17 | 96 | 13 | 0 | 144 |
| Miscellaneous molluscs & aq. inver., other than live, fresh or chilled, nei | ... | ... | ... | ... | ... | ... | ... | ... | 29 | 204 | 117 |
| Fish nei, smoked | ... | ... | ... | ... | ... | ... | ... | ... | ... | 86 | 86 |
| Squids nei, frozen | ... | ... | 127 | 49 | 1 | - | - | - | - | - | 59 |
| Swordfish fillets, fresh or chilled | ... | ... | ... | ... | ... | ... | ... | ... | 57 | - | 57 |
| Fish fillets, frozen, nei | 6 | ... | 52 | 3 | 72 | 136 | 106 | 4 | - | - | 54 |
| Crustaceans nei, frozen | 131 | 0 0 | 36 | 12 | 23 | 0 0 | 1 | - | - | - | 41 |
| Scallops, live, fresh or chilled, nei | 56 | ... | ... | 0 0 | ... | 0 0 | ... | ... | 0 0 | 13 | 35 |
| Swordfish fillets, frozen | ... | ... | ... | ... | ... | ... | ... | ... | 32 | - | 32 |
| Scallops, other than live, fresh or chilled | ... | ... | ... | ... | ... | ... | ... | ... | ... | 23 | 23 |
| Tunas, fresh or chilled, nei | ... | ... | ... | ... | ... | ... | ... | ... | 34 | 1 | 18 |
| Yellowfin tuna, frozen, nei | ... | ... | ... | ... | ... | ... | ... | ... | 14 | 8 | 11 |
| Other products | 2 | 0 | 18 | 5 | 2 | 4 | 3 | 1 | 16 | 27 | 43 |

Source: FAO Fishstat. Note: Exports are under-reported. See the following sections for more updated information on selected fisheries.



9.5 BECHE DE MER VALUE CHAIN AND EXPORT TRENDS

Figure 1. Beche-de-mer export trends and quotas



Source: Nautilus

Figure 2. Beche de mer production, 2008 - 2011

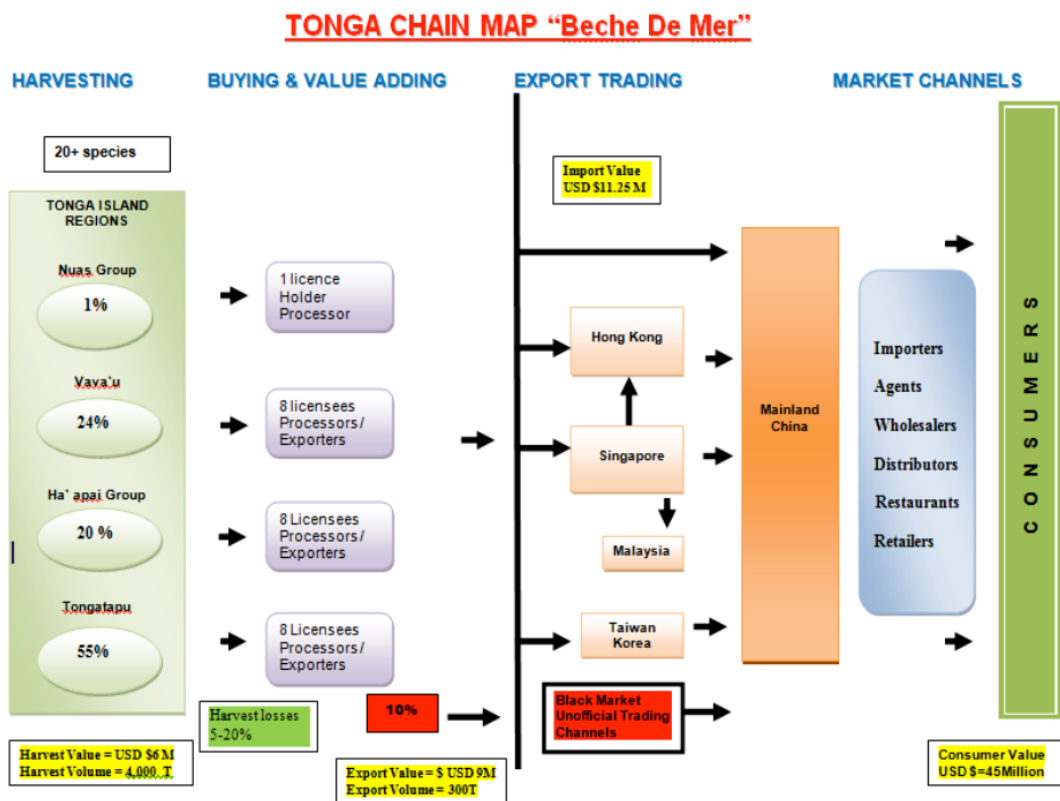


Table 12. Changes in the beche-de-mer fishery 2008-2013

| | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---------------------|------|-----------|-----------|-----------|---------|---------|
| Number of Licenses | | 25 | 22 | 12 | 10 | 9 |
| Quota (tons) | 189 | 204 | 212 | 103 | 103 | 103 |
| Export (tons)* | 15 | 370 | 313 | 79 | 68 | 56 |
| License fees (unit) | | 3,111 | 3,111 | 29,452 | 29,452 | 29,452 |
| Total license fees | | 77,769 | 68,437 | 353,418 | 294,515 | 265,064 |
| Export (kg)* | | 369,944 | 313,231 | 79,497 | 67,873 | 59,746 |
| Value (FOB) | | 3,547,294 | 2,700,584 | 3,194,001 | 544,489 | 600,365 |

Source: Fisheries Division. Note: * there are discrepancies between different sources of information.

Figure 3 Beche de mer value chain



9.6 TUNA

Table 13. Evolution of the longline fleet operating in the Tongan EEZ

| | Domestic | | | Locally based foreign | | | Foreign | | | TOTAL | | |
|------|----------------|-----------|------|-----------------------|-----------|------|-----------------|-----------|------|-----------------|-----------|------|
| | During year | At 31 Dec | FYE | During year | At 31 Dec | FYE | During year | At 31 Dec | FYE | During year | At 31 Dec | FYE |
| 2001 | 22 | 14 | 16.3 | 2 | 1 | 1.4 | 0 | 0 | 0 | 24 | 15 | 17.7 |
| 2002 | 20 | 14 | 17.0 | 12 | 11 | 7.8 | 0 | 0 | 0 | 32 | 25 | 24.8 |
| 2003 | 18 | 13 | 12.7 | 16 | 10 | 14.2 | 0 | 0 | 0 | 34 | 23 | 26.9 |
| 2004 | 14 | 11 | 11.7 | 13 | 9 | 9.5 | 0 | 0 | 0 | 27 | 20 | 21.3 |
| 2005 | 15 | 13 | 12.1 | 9 | 0 | 1.8 | 0 | 0 | 0 | 24 | 13 | 13.9 |
| 2006 | 12 | 11 | 10.9 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 11 | 10.9 |
| 2007 | 13 | 12 | 12.5 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 12 | 12.5 |
| 2008 | 12 | 9 | 10.2 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 9 | 10.2 |
| 2009 | 9 | 6 | 7.8 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 6 | 7.8 |
| 2010 | 6 | 6 | 6.0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 6 | 6.0 |
| 2011 | 6 | 3 | 3.7 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 3 | 3.7 |
| 2012 | 4 | 2 | 2.5 | 3 | 3 | 0.3 | 12 | 12 | 6.1 | 19 | 17 | 9.0 |
| 2013 | 3 | 1 | 2.1 | 6 ^a | 1 | 2.5 | 22 ^a | 16 | 18.6 | 31 | 18 | 23.2 |
| 2014 | 2 ^b | 2 | ne | 0 ^b | 0 | ne | 16 ^b | 5 | ne | 18 ^b | 7 | ne |

Notes: a. Includes three vessels that were issued locally based foreign licences in January 2013 and transferred to a foreign license in March 2013. b. For the period 1 January to 30 April. c. As at April 30.

Source: C. Reid

Table 14. Number of licensed longline vessel, 2001-14

| Years | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Vessels | 15 | 25 | 23 | 20 | 13 | 11 | 12 | 9 | 6 | 6 | 3 | 17 | 18 | 7 |

Note: The number provide reflect the number of licensed vessels as at December 31 of the given year, except for 2014 which reflects licensed vessel numbers as at 31 July (Source: Fisheries Division, May and August 2014)

Table 15. Employment in the tuna fisheries of Tonga

| | 2002 | 2006 | 2008 |
|--------------------------------|------|------|------|
| Local Jobs on Vessels | 161 | 75 | 45 |
| Local Jobs in Shore Facilities | 85 | 35 | 35 |
| Total | 246 | 110 | 80 |

In 2012, 0.24% or 1,908 tonnes of the catch from FFA members waters was taken from Tonga’s EEZ and valued at USD 9.4 million and this doubled in 2013 to about USD 19 million. Under SC-STBF harvest strategy aimed at establishing regional and national restrictions on albacore catches Tonga’s current indicative allowance is 2,500mt. Actual vessel numbers and catch levels are all significantly below these levels.

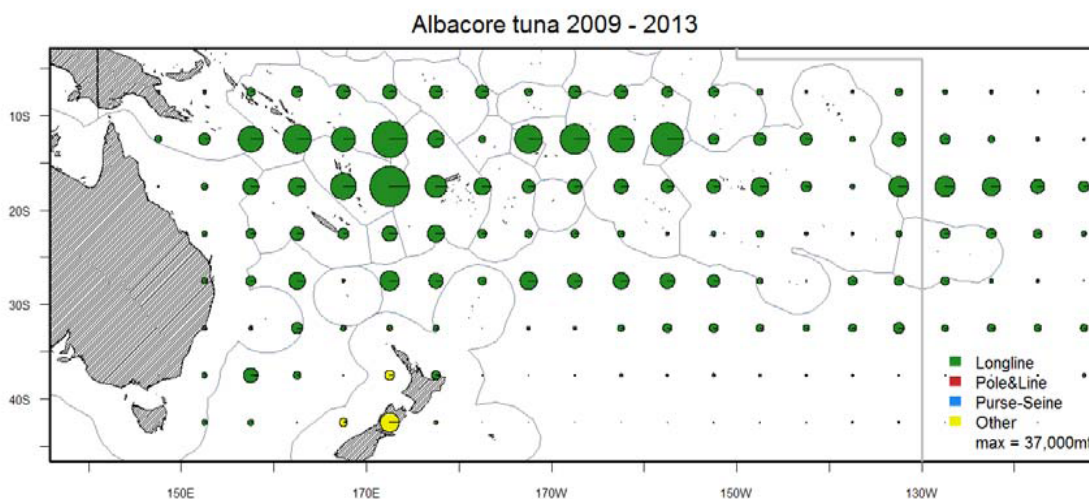
Based on the results of an FFA analysis if MEY was to be targeted the following management limits could be used and give rents between (US\$ 0.6 and 2.7 million):

- albacore catch limited to around 1,100mt.
- total catch limited to around 2,400mt.
- TAE effort restricted to around 2,250 days (based on a vessel setting 3,100 hooks per day).
- vessel numbers restricted to around 10 based on each vessel working full time in the fishery

Figure 4. Distribution of Tonga tuna fleet effort



Figure 5. Distribution of albacore catches 2009-2013



Source: SPC/ WCPFC

Figure 6. Effort in the southern longline fishery 1990-2013

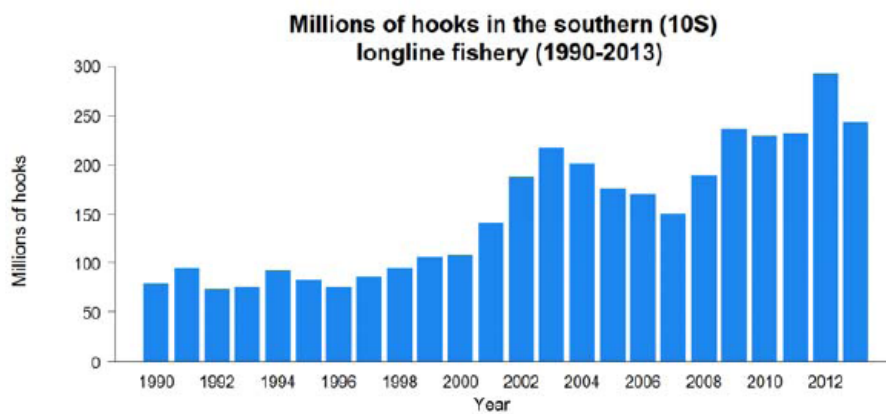


Table 16. Tonga tuna catches 2000-2013

| | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 |
|---------------------|-------|-------|-------|-------|-------|-------|-------|
| Tonga in T-EEZ | 1,156 | 1,524 | 1,240 | 643 | 383 | 598 | 746 |
| Tonga outside EEZ | 844 | 477 | 762 | 1,360 | 1,621 | 1,407 | 1,260 |
| Total Tonga fleet | 1,161 | 1,733 | 1,672 | 971 | 388 | 629 | 759 |
| Total catch T-EEZ | 1,156 | 1,548 | 1,241 | 644 | 418 | 598 | 746 |
| Foreign catch T-EEZ | - | 25 | 1 | 1 | 35 | - | - |

| | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| Tonga in T-EEZ | 746 | 821 | 592 | 271 | 128 | 224 | 171 | 146 |
| Tonga outside EEZ | 1,260 | 1,186 | 1,416 | 1,738 | 1,882 | 1,787 | 1,841 | 1,867 |
| Total Tonga fleet | 759 | 861 | 592 | 271 | 128 | 224 | 171 | 147 |
| Total catch T-EEZ | 746 | 821 | 593 | 271 | 128 | 243 | 1,393 | 2,913 |
| Foreign catch T-EEZ | - | - | 1 | 0 | - | 19 | 1,222 | 2,766 |

9.7 DEEPWATER SNAPPER

Figure 7. Distribution of deepwater snapper fishing effort

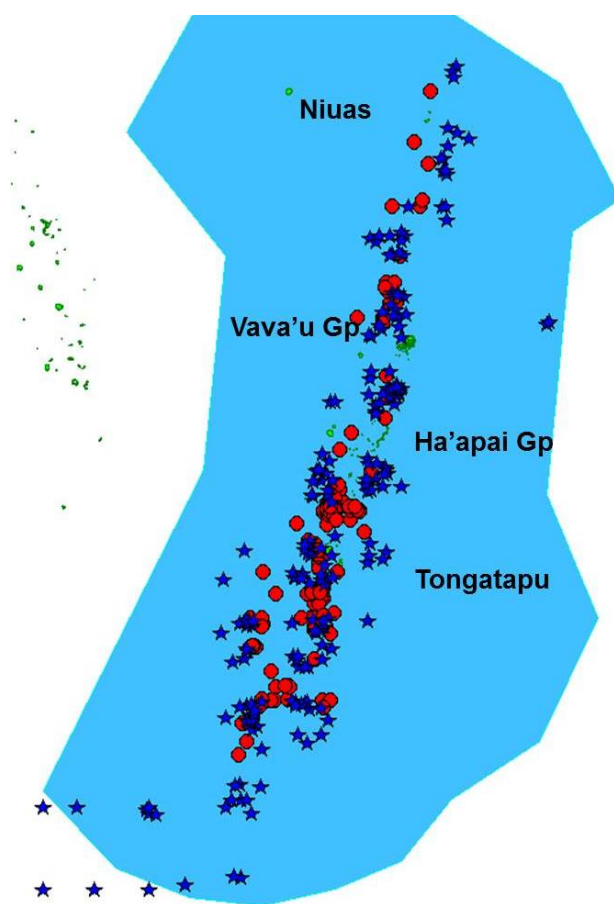
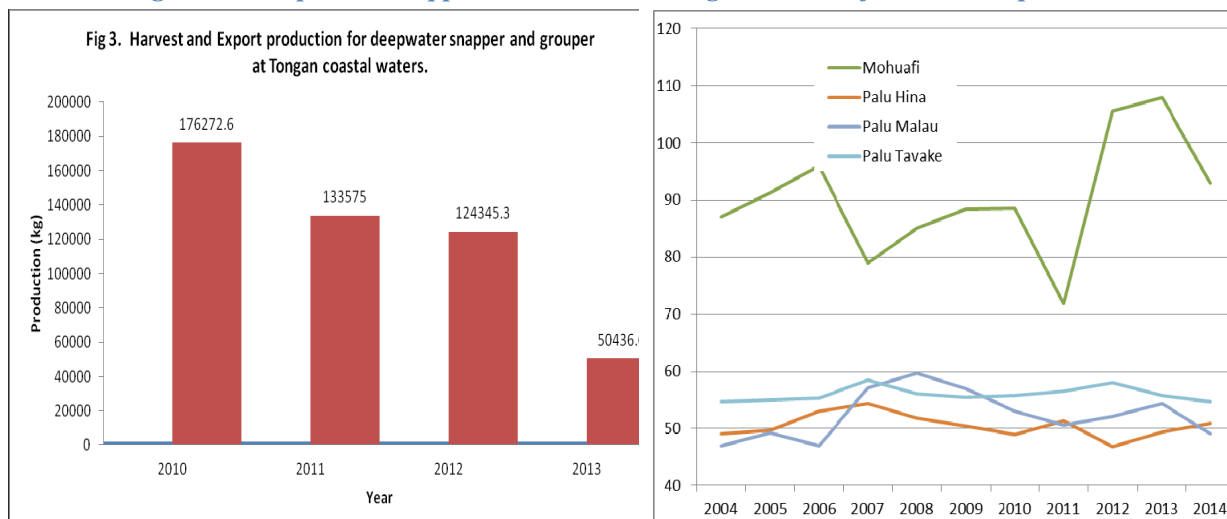
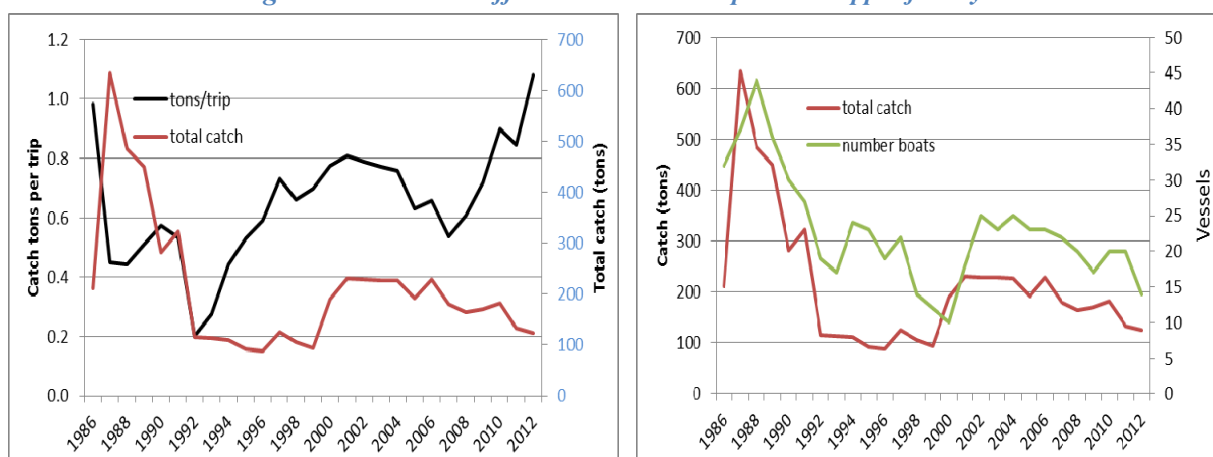


Figure 8. Deepwater snapper harvest and average size trend for selected species



Sources: Fisheries Division Database, 2013

Figure 9. Catch and effort trends in the deepwater snapper fishery



Source: From Fisheries Div. database

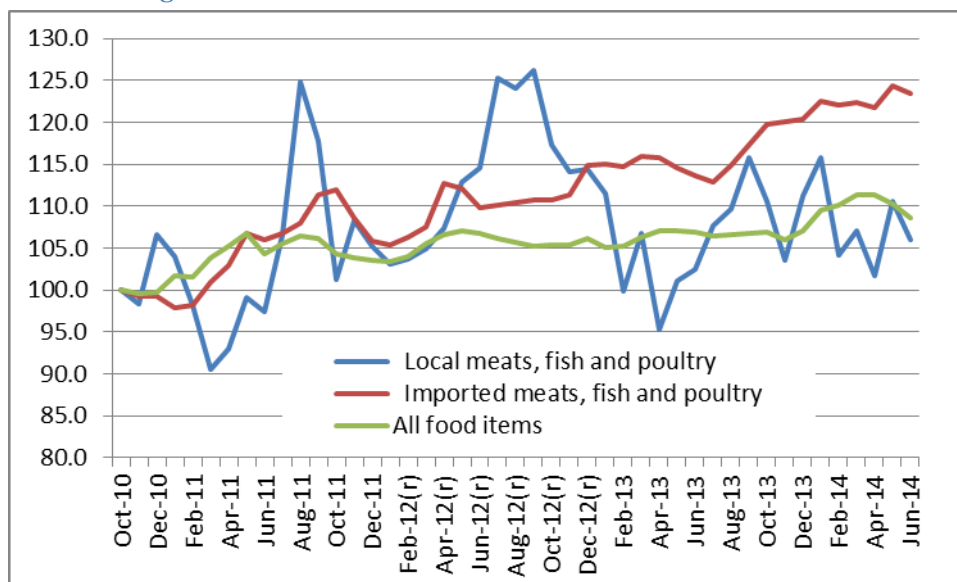
Table 17. Recorded effort (fishing days) by snapper vessels in 2013

| | |
|-----------------|----|
| Pacific Sunrise | 2 |
| Ilaisaane Ramon | 7 |
| Tavake | 11 |
| Lesila | 21 |
| Anamanusiu | 39 |
| Hope | 43 |
| Densiola | 52 |
| Vicky Anne | 64 |
| Kelly | 80 |
| Odyssey | 94 |

Sources: Fisheries Division Database, 2013

9.8 FOOD SECURITY

Figure 10. Trends in the Consumer Price Index 2010-2014



Source: GoT, Statistics Dept.

Table 18. Composition of food component of the CPI

| | Weights | | | Dec-2014 | | |
|---------------------------------------|-------------|-------------|-------------|--------------|--------------|--------------|
| | Local | Imported | Total | Local | Imported | Total |
| A. FOOD | 17.8 | 27.9 | 45.8 | 102.4 | 115.6 | 110.5 |
| Fruit and vegetables | 6.5 | 0.9 | 7.5 | 98.7 | 118.4 | 101.1 |
| Meats, Fish & Poultry | 3.7 | 14.6 | 18.4 | 104.1 | 125.4 | 121 |
| Dairy Farm & Vegetable Products | 0.5 | 3.2 | 3.6 | 109.2 | 110.7 | 110.5 |
| Cereals and Cereal Products | 3.4 | 3.5 | 6.9 | 108.2 | 103.8 | 105.9 |
| Other Food | 0 | 5.7 | 5.7 | 0 | 100.1 | 100.1 |
| Drinks, Sweets & Meals away from home | 3.7 | 0 | 3.7 | 101 | 0 | 101 |
| TOTAL | 42.2 | 57.8 | 100 | 102.5 | 110.9 | 107.3 |

Source: GoT, Statistics Dept.

Table 19. Composition and change in fish CPI 2003-2012

| | 2003-04 | 2004-05 | 2005-06 | 2006-07 | 2007-08 | 2008-09 | 2009-10 | 2010-11 | 2011-12 | 2012-13 |
|----------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|---------------|---------------|---------------|
| Tuna -wharf | 47.39 | 50.61 | 56.10 | 63.75 | 71.56 | 76.23 | 90.34 | 100.00 | 112.43 | 111.97 |
| Mixed string fish | 60.50 | 47.15 | 53.06 | 106.18 | 100.64 | 100.39 | 109.67 | 100.00 | 99.12 | 107.23 |
| Octopus | 50.05 | 45.15 | 48.72 | 85.35 | 108.21 | 110.43 | 97.72 | 100.00 | 174.84 | 129.17 |
| Cockles, Pipis | 69.32 | 69.90 | 73.43 | 105.13 | 120.55 | 124.12 | 133.10 | 100.00 | 107.39 | 113.59 |
| Frozen fish | 49.34 | 49.99 | 49.50 | 63.55 | 69.37 | 74.66 | 91.54 | 100.00 | 111.68 | 111.61 |
| Clam-vasuva | 52.59 | 49.33 | 53.06 | 78.72 | 82.19 | 85.35 | 97.74 | 100.00 | 106.22 | 110.43 |
| Sea urchin- tukumisi | 52.59 | 49.33 | 53.06 | 78.72 | 82.19 | 85.35 | 97.74 | 100.00 | 200.01 | 164.75 |
| CPI fish | 52.59 | 49.33 | 53.06 | 78.72 | 82.19 | 85.35 | 97.74 | 100.00 | 111.05 | 111.64 |

Source: GoT, Statistics Dept. Note: CPI index for fish (2010-11 =100)

Table 20. Household consumption of subsistence and marketed domestic fish production 2009

| From HIES 2009 | Market | Own consumption | Given away | Non-market | Total |
|--------------------------|--------------|-----------------|------------|--------------|--------|
| Fish | 4,866 | 2,121 | 1,141 | 3,262 | 8,128 |
| Other | 1,384 | 240 | 48 | 287 | 1,672 |
| Octopus | 298 | 121 | 27 | 147 | 445 |
| Lobster | 267 | 42 | 22 | 64 | 331 |
| Clam | 168 | 20 | 9 | 29 | 198 |
| Crab | 132 | 91 | 19 | 110 | 242 |
| Seaweed | 98 | 0 | | 0 | 98 |
| Sea urchin | 82 | 10 | 1 | 11 | 93 |
| Sea fare | 52 | | | - | 52 |
| Shrimp | 12 | 3 | 1 | 4 | 16 |
| Sea eel | 4 | | 3 | 3 | 8 |
| Total fish | 7,363 | 2,648 | 1,271 | 3,919 | 11,282 |
| market/own consumption % | 65.3% | | | 34.7% | 100.0% |
| growth rate (2001 HIES) | 175.9% | | | 111.7% | 149.6% |

Source: GoT, Statistics Dept. from HIES, 2009 (unadjusted). Note: excludes imports. In T\$ 000.

Table 21. Recorded and estimated consumption of fish 2001 & 2009-2014 (T\$ 000)

| | 2001 HIES | 2009 HIES | 2010 | 2011 | 2012 | 2013 | 2014 |
|--------------------------|-----------|-----------|--------|--------|--------|--------|--------|
| Marketed consumption | 8,820 | 8,836 | 8,836 | 8,134 | 7,660 | 8,273 | 12,327 |
| Non-marketed consumption | 2,800 | 4,703 | 4,703 | 4,329 | 4,077 | 4,403 | 6,561 |
| Total consumption | 11,620 | 13,538 | 13,538 | 12,462 | 11,737 | 12,676 | 18,887 |

Source: GoT Statistics Dept.; Note: with 20% undercoverage adjustment.

9.9 MARINE RESERVES, PARKS AND CONSERVATION AREAS

Table 22. List of marine conservation areas (excluding SMAs)

| No. | Category | Area |
|---|------------------------------------|--------------|
| Reserves (6) | | |
| 1 | Ha'atafu Beach | 80 ha |
| 2 | Hakaumama'o Reef | 260 ha |
| 3 | Malinoa Island Park & Reef | 73 |
| 4 | Monuafe Island Park & Reef | 33 ha |
| 5 | Mui Hopo Hoponga Coastal Reserve | - |
| 6 | Pangaimotu Reef | 49 ha |
| Parks/Managed Historical Sites (2) | | |
| 7 | Ha'amonga Trilithon Park | 23 ha |
| 8 | Vava'u Coastal Gardens Marine Park | - |
| Faunal Reserve (1) | | |
| 9 | Volcanic Island Forest Reserve | - |
| Marine Reserves (1) | | |
| 10 | Fanga'uta and Fanga kakau Lagoons | 2,835 ha |
| Multiple Use Conservation Area (1) | | |
| 11 | Haapai Conservation Area | 1,000,000 ha |
| National Parks (4) | | |
| 12 | 'Eua NP | 450 ha |
| 13 | Kao NP | 1,250 ha |
| 14 | Mt Talau NP | - |
| 15 | Tofua NP | 4,990 ha |
| Nature Reserve (1) | | |
| 16 | Vaomapa | 20 ha |
| Other Areas (2) | | |
| 17 | Neiafu Harbour Wreck | |
| 18 | Swallows Cave | |
| Sanctuary | | |
| 19 | Mounu Reef | |

9.10 NUKUALOFA PORT

Figure 11. Planned extensions of Queen Salote wharf area

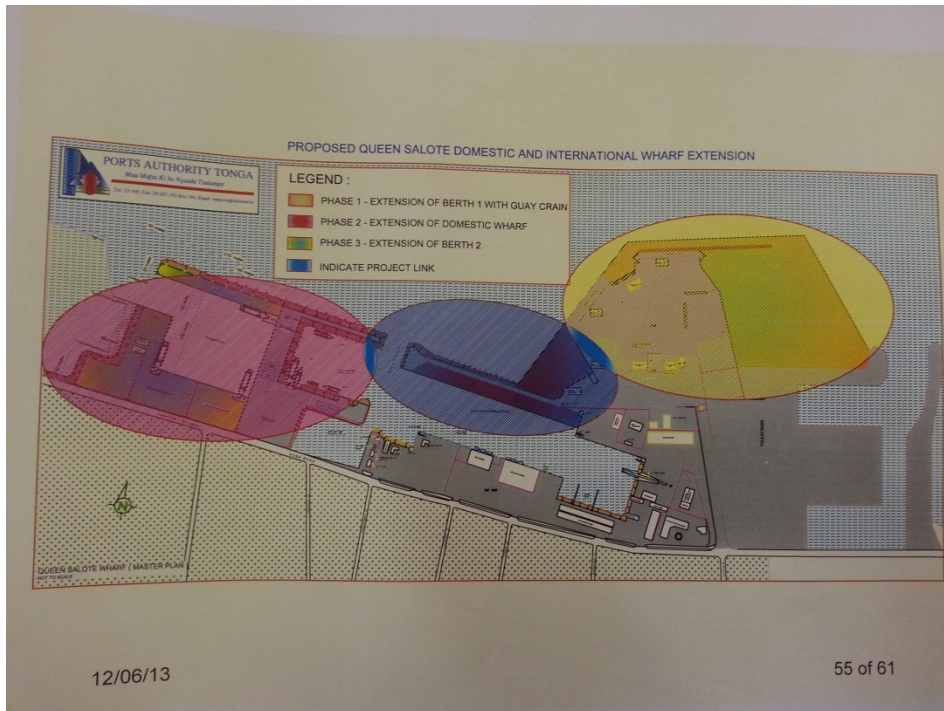


Figure 12. Queen Salote wharf showing fisheries areas



9.11 MAPS

Figure 13. Tonga EEZ

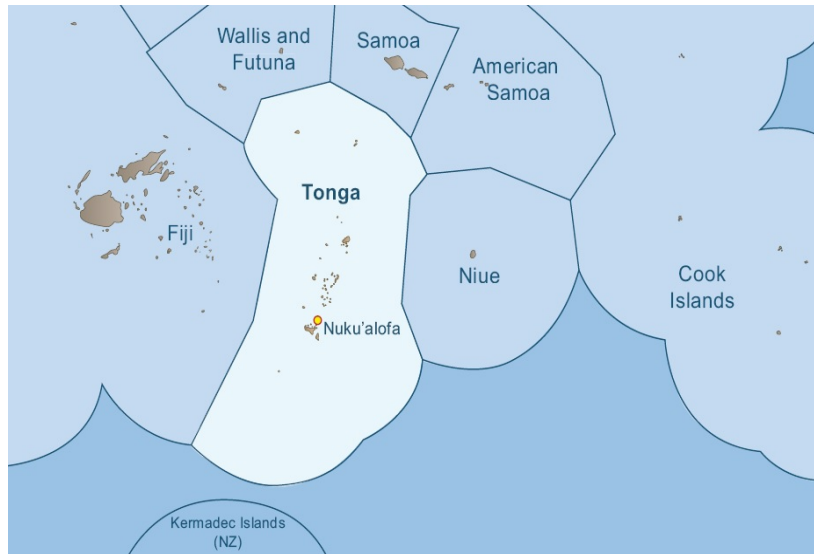


Figure 14. Bathymetry of the main island groups.

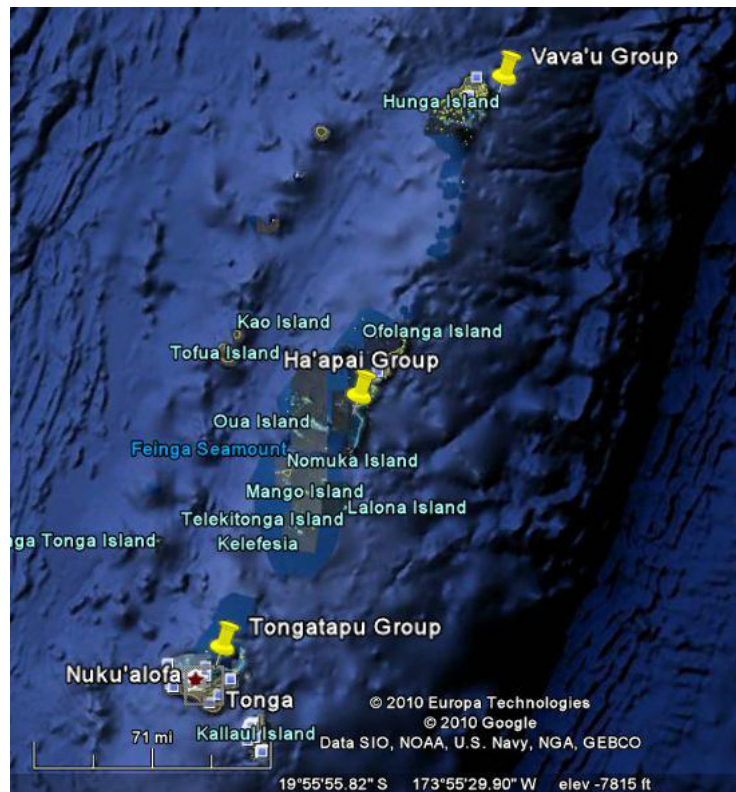
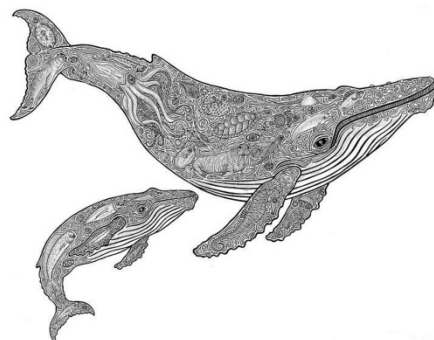
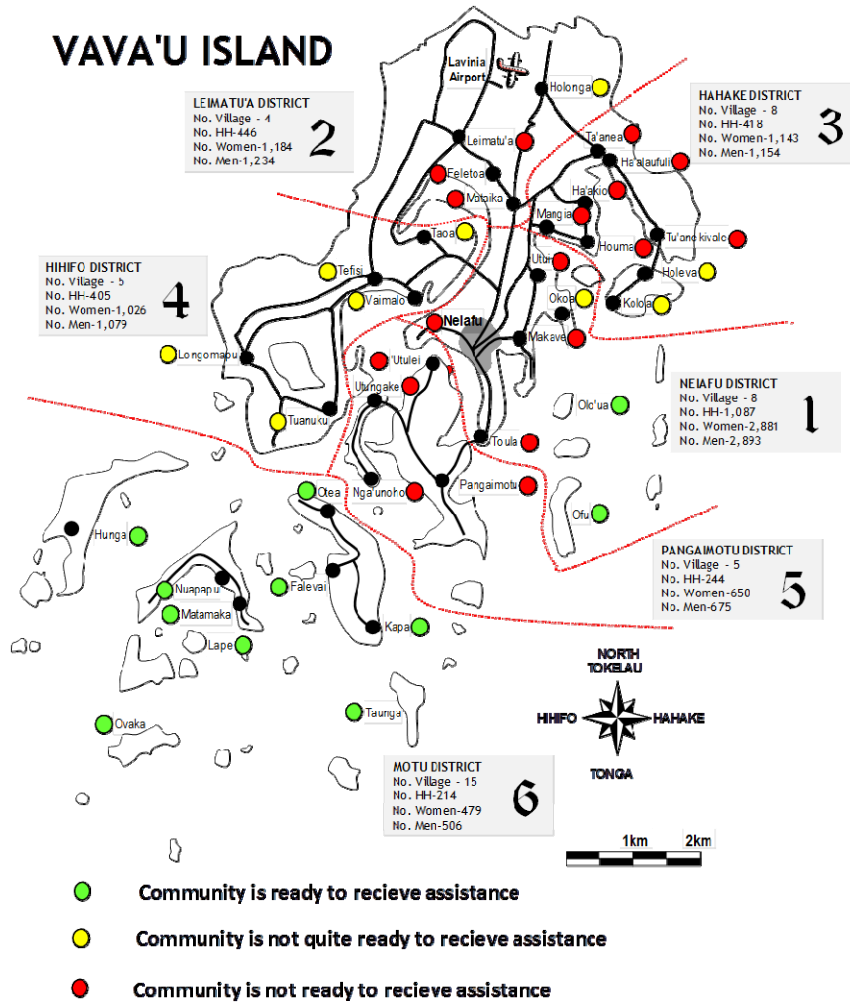


Figure 15. Example of community readiness map prepared by MORDI



9.12 DETAILED COST ESTIMATES FOR TFSP

Table 23. Detailed cost estimates for TFSP

| | Phase Year/ Cost estimates in US\$'000 | Ph. 1 | Phase 2 | | | Ph. 3 |
|---|--|--------------|-------------|-------------|--------------|---------------|
| | | 1 | 2 | 3 | 4 | 5-9 |
| | Current budget allocation (to be maintained) | 900 | 900 | 900 | 900 | 4500 |
| | <i>Special incremental allocation for asset maintenance (+20% of existing allocation)</i> | 84 | 84 | 84 | 84 | 420 |
| | <i>Special incremental allocation for upgrading to Ministry (+7% of existing allocation)</i> | 63 | 63 | 63 | 63 | 315 |
| A. | TOTAL ADJUSTED RECURRENT | 1047 | 1047 | 1047 | 1047 | 5235 |
| Estimated incremental budget (additional for TFSP) | | | | | | |
| I. | Component 1. Sustainable Community Fisheries | 460.1 | 463 | 474 | 418.1 | 1913.1 |
| 1.1. | Sub-component 1.1. Enhancement of the SMA Programme | 266 | 240 | 234 | 228.1 | 1098.1 |
| 1.1.1 | Core Community Fisheries team | 116 | 100 | 101 | 100 | 532 |
| | <i>CF leader</i> | 20 | 20 | 20 | 20 | 100 |
| | <i>Ecologist</i> | 12 | 12 | 12 | 12 | 60 |
| | <i>Sociologist</i> | 15 | 15 | 15 | 15 | 75 |
| | <i>Economist/ small business specialist</i> | 15 | 15 | 15 | 15 | 75 |
| | <i>Communications specialist</i> | 12 | 12 | 12 | 12 | 60 |
| | <i>Vessel operators/ divers</i> | 16 | 16 | 16 | 16 | 80 |
| | <i>Diving gear</i> | 1 | 0 | 1 | 0 | 2 |
| | <i>Vehicle (T.tapu)</i> | 15 | 0 | 0 | 0 | 30 |
| | <i>Operating costs</i> | 10 | 10 | 10 | 10 | 50 |
| 1.1.2 | Outer Islands Community Fisheries team | 136 | 121 | 121 | 126 | 556 |
| | <i>Senior fisheries officer</i> | 45 | 45 | 45 | 45 | 225 |
| | <i>Field assistant</i> | 36 | 36 | 36 | 36 | 180 |
| | <i>Driver/ boat operator</i> | 24 | 24 | 24 | 24 | 120 |
| | <i>Small vessels</i> | 10 | 0 | 0 | 0 | 10 |
| | <i>Diving gear</i> | 4.5 | 0 | 0 | 4.5 | 4.5 |
| | <i>GPS</i> | 0.6 | 0 | 0 | 0.6 | 0.6 |
| | <i>Operating costs of current SMAs (monitoring, advice)</i> | 16 | 16 | 16 | 16 | 16 |
| 1.1.2 | Studies | 2 | 2 | | | |
| | <i>Monitoring of SMA performance</i> | 0.5 | 0.5 | | | 1 |
| | <i>Legal study on rights and tenure (and follow up)</i> | 1.5 | 1.5 | | | 3 |
| 1.1.3 | Awareness and capacity development | 12 | 17 | 12 | 2 | 10 |
| | <i>SMA Leadership workshops (in communities)</i> | 2 | 2 | 2 | 2 | 10 |
| | <i>National dialogue/ workshops on SMAs and community fisheries</i> | 5 | 10 | 5 | | 0 |
| | <i>Development of pilot school curriculum modules on sustainable marine resources</i> | 5 | 5 | 5 | | 0 |
| 1.2. | Sub-component 1.2. Expansion of the SMA Network | 154 | 123 | 150 | 120 | 775 |
| 1.2.1 | Investment costs new SMAs | 132 | 102 | 108 | 120 | 668 |
| | <i>Establishment of SMAs</i> | 120 | 80 | 80 | 80 | 320 |
| | <i>Operating costs SMAs (monitoring, advice)</i> | 12 | 20 | 28 | 36 | 340 |
| | <i>Monitoring of SMA performance (periodic evaluation)</i> | | 2 | | 4 | 8 |
| 1.2.2 | Small grants incentive programme (TRIP model) | 22 | 21 | 42 | | 107 |
| | <i>Grant fund scheme</i> | 20 | 20 | 40 | | 100 |
| | <i>Management and accounting (possibly integrates with other schemes)</i> | 1 | 1 | 1 | | 5 |
| | <i>Auditing (possibly integrated)</i> | 1 | 0 | 1 | | 2 |
| 1.3. | Sub-component 1.3. Management and development of coastal fisheries | 40 | 100 | 90 | 70 | 40 |
| 1.3.1 | Development of fisher associations | | | | | |
| | <i>Studies, stakeholder dialogues</i> | 20 | 20 | 0 | 0 | 0 |
| 1.3.2 | Development of fisher association co-management regimes | | | | | |
| | <i>National dialogue on coastal tenure</i> | 0 | 10 | 10 | 0 | 10 |
| | <i>Co-management of selected resources/ legal empowerment</i> | 0 | 0 | 10 | 10 | 20 |
| 1.3.3 | Business development assistance to fisher associations | | | | | |
| | <i>Design of incentive schemes/ business support</i> | 20 | 0 | 0 | 0 | 0 |
| | <i>Business advisory support/ credit advice</i> | 0 | 20 | 20 | 10 | 10 |

| | Phase | Ph. 1 | Phase 2 | | Ph. 3 | |
|-----------|--|------------|------------|------------|------------|--------------|
| | Year/ Cost estimates in US\$'000 | 1 | 2 | 3 | 4 | 5-9 |
| | <i>Small matching grants</i> | 0 | 50 | 50 | 50 | 0 |
| | <i>[Infrastructure and services - see Sub-component 3.3]</i> | | | | | |
| 2. | Component 2. Economic development of commercial fisheries and aquaculture | 315 | 790 | 275 | 560 | 1030 |
| 2.1. | Sub-component 2.1. Management of commercial fisheries | 150 | 190 | 150 | 150 | 750 |
| | Review and updating of management plans | | | | | |
| | Tuna, including international engagements | 50 | 50 | 50 | 50 | 250 |
| | Deepwater snapper, including vessel tracking | 20 | 20 | 20 | 20 | 100 |
| | Beche-de-mer | 40 | 80 | 40 | 40 | 200 |
| | Other small-scale commercial fisheries | 40 | 40 | 40 | 40 | 200 |
| | Bioeconomic information and analysis | 5 | 10 | 5 | 5 | 20 |
| 2.2. | Sub-component 2.2. Economic development of commercial fisheries and aquaculture | 165 | 600 | 125 | 410 | 280 |
| 2.2.1 | Institutional support to private sector | | | | | |
| | Establishment of fisheries associations by species or area | 40 | 40 | 20 | 20 | 100 |
| | Establishment of beche-de-mer cooperative monopoly | 25 | 50 | 25 | 0 | 0 |
| 2.2.2 | Business development support | | | | | |
| | Support for credit and microfinance | 50 | 100 | 50 | 20 | 100 |
| | Development marketplace (competitive innovation grants) | 20 | 0 | 20 | 0 | 40 |
| | Business advisory services for commercial/ export fisheries | 20 | 10 | 10 | 10 | 40 |
| | Other support (sanitary, marketing, labelling) | | | | | |
| 2.2.3 | Commercial aquaculture | | | | | |
| | Preparation of investment guidelines and support package | 10 | 40 | | | |
| | Private investments | | 300 | | 300 | |
| | Support package (drawdown subject to feasibility and conditions) | | 60 | | 60 | |
| | [up to 20% of investments] | | | | | |
| 3. | Component 3. Public and private investment | 55 | 302 | 110 | 125 | 10000 |
| 3.1. | Sub-component 3.1. Preparation of public investment in infrastructure | 25 | 62 | 5 | 0 | 0 |
| | Master plan for Tu'imatamoana fisheries harbour facilities | 10 | 50 | | | |
| | Determination of modalities for provision/ operation of airport chill room | 2 | | | | |
| | Study on upgrading Nuku'alofa public fish market | | 5 | 5 | | |
| | Study on provision of affordable fishing gear (and bait) | 3 | | | | |
| | Design / estimates for upgrading of Sopu facilities | 10 | | | | |
| | Design / estimates for upgrading of Pangai facilities | | 7 | | | |
| 3.2. | Sub-component 3.2. Implementation of infrastructure investment projects | 30 | 20 | 75 | 125 | 10000 |
| | Implementation of Tu'imatamoana master plan (contingent on feasibility) | | | | | 10000 |
| | Commercial financing of airport chill room | 30 | | | | |
| | Upgrading of Nuku'alofa fish market | | | | 50 | |
| | Rehabilitation/ upgrading of Sopu | | | 50 | 50 | |
| | Rehabilitation/ upgrading of Pangai facilities | | | 25 | 25 | |
| | Revolving fund for affordable fishing gear and supplies | | 20 | | | |
| 3.3. | Sub-component 3.3. Special assistance for export fisheries | | 220 | 30 | | |
| | <i>[in response to specific request from NFC members]</i> | | | | | |
| | Tu'imatamoana ice machines (NFC) | | 50 | | | |
| | Tu'imatamoana processing and chill rooms (NFC) | | 30 | | | |
| | Loan guarantee for vessel acquisition loans (TDB) | | 50 | | | |
| | Pangai ice machine and chill room | | 15 | | | |
| | Niafu ice machine | | 15 | | | |
| | Air freight subsidy | | 60 | 30 | | |

| | Phase | Ph. 1 | Phase 2 | | Ph. 3 | |
|----------------------------------|--|--------------|--------------|--------------|--------------|---------------|
| | | 1 | 2 | 3 | 4 | 5-9 |
| Year/ Cost estimates in US\$'000 | | | | | | |
| 4. | Component 4. Good governance and capacity building | 265 | 179 | 209 | 179 | 785 |
| 4.1. | Sub-component 4.1. Capacity building in the fisheries administration | 115 | 115 | 135 | 115 | 575 |
| | Staff training programme | 40 | 40 | 60 | 40 | 200 |
| | Technical assistance | 20 | 20 | 20 | 20 | 100 |
| | Project Operations Unit for TFSP coordination | | | | | |
| | <i>Operations team leader</i> | 20 | 20 | 20 | 20 | 100 |
| | <i>Senior planning officers (2)</i> | 15 | 15 | 15 | 15 | 75 |
| | <i>M&E officer</i> | 12 | 12 | 12 | 12 | 60 |
| | <i>Team assistant</i> | 8 | 8 | 8 | 8 | 40 |
| 4.2. | Sub-component 4.2. Coordination and support for stakeholder capacity building | 15 | 5 | 15 | 5 | 45 |
| | Operation of the Fisheries Growth Committee and Fisheries Management Council | 5 | 5 | 5 | 5 | 25 |
| | National dialogues (tenure, climate, oceans policy, other) | 10 | 0 | 10 | 0 | 20 |
| 4.3. | Sub-component 4.3. Policy reform processes | 135 | 59 | 59 | 59 | 165 |
| | Advisory services / technical assistance | 100 | 40 | 40 | 40 | 100 |
| | Advisory services / technical assistance | 20 | 4 | 4 | 4 | 10 |
| | Publications, workshops, consultations | 10 | 10 | 10 | 10 | 50 |
| | Legal services | 4 | 4 | 4 | 4 | |
| | Donor coordination group | 1 | 1 | 1 | 1 | 5 |
| B. | TOTAL INCREMENTAL ESTIMATE | 1,216 | 2,301 | 1,103 | 1,652 | 13,943 |
| C. | TOTAL WITH INCLUSION OF CURRENT GoT EXPENDITURE (A+B) | 2,263 | 3,348 | 2,150 | 2,699 | 19,178 |

Note: Excel spread sheet provided. See notes in Excel for detailed explanation of cost estimates.



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