

Adapting tuna-dependent Pacific Island communities and economies to climate change

Study 9: Identification of financing mechanisms, supporting policies and capacity needs to sustain the benefits achieved through investment by GCF

Part 1: Finance mechanisms and supporting policies to sustain national FAD programs

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Executive summary

Component B of the Green Climate Fund (GCF) Regional Tuna Programme (RTP) titled: Adapting tuna-dependent Pacific Island communities and economies to climate change, under RFP22-3866 addresses the need to manage the challenges associated with national food security. One of the priorities for the RTP is to increase the supply of tuna to coastal communities through strengthening the use of anchored fish aggregating devices (FADs) by artisanal fishers. This priority is driven by the projected degradation of coral reefs and production of associated fish species due to ocean warming and acidification, and the need to fill the expected gap in fish supply.¹

The purpose of this study, as stated in the SPC RFP², is to assess the scope and need for the Governments of all 14 participating countries to sustain strengthened national FAD Programs to increase access to tuna for the food security of coastal communities by:³

1. Classifying FADs as part of the permanent national infrastructure for food security and incorporating National FAD Programs within ongoing National Development Plans and recurring budgets;
2. Creating legislation to prosecute willful actions that result in destroyed or damaged FADs, or violate community- based FAD rules;
3. Promoting models for community and industry engagement and ownership of FADs;
4. Promoting transfer of fishing effort by small-scale fishers in coastal communities from coral reefs to tuna;
5. Including the importance of tuna consumption for improved nutrition in national programs to combat non-communicable diseases in rural areas; and
6. Analysis of the long-term costs of maintaining FAD programs and the suitable sources of finance and mechanisms to maintain their ongoing costs.

Although the use of anchored FADs⁴ is well embedded in coastal artisanal fishing practices, the history of the region's experience with the deployment of FADs for coastal fisheries can be characterised as *ad hoc*. FAD deployment initiatives for coastal fisheries have generally not been supported by formal national policy, few national fisheries agencies have embedded support for coastal FADs in their recurrent work program and funding has largely been dependent on a range of sources of bilateral development assistance on an opportunistic basis. In addition, the deployment and maintenance of FADs several kilometers offshore raises issues associated with sea safety. Anchored FADs have a limited life span and may last less than a year unless they are a) properly built and anchored in the correct locations, b)

¹ Bell, J.D., Allain, V., Gupta, A.S., Johnson, J.E., Hampton, J., Hobday, A.J., Lehodey, P., Lenton, A., Moore, B.R., Pratchett, M.S. and Senina, I. 2018. Climate change impacts, vulnerabilities and adaptations: Western and Central Pacific Ocean marine fisheries. *Impacts of climate change on fisheries and aquaculture*, p.305.

² SPC 2022, *Request for proposals*. Accessed July 2023. <https://www.spc.int/sites/default/files/tenderfiles/2022-05/RFP22-3866%20-%20FAME%20-%20Studies%20to%20support%20GCF%20proposal.pdf>

³ SPC 2022, *Request for proposals*. Accessed July 2023. <https://www.spc.int/sites/default/files/tenderfiles/2022-05/RFP22-3866%20-%20FAME%20-%20Studies%20to%20support%20GCF%20proposal.pdf>

⁴ Fish aggregating device (FAD) is a generic term that applies to a range of floating objects that aggregate fish. The industrial tuna surface fishery (purse seine and pole and line vessels) takes advantage of fish aggregations beneath naturally occurring floating objects such as logs that are disgorged from rivers. The industrial purse seine fishery also deploys floating rafts that drift with the currents to aggregate tuna. Anchored FADs are also used by the industrial fleets. Coastal artisanal and commercial fishers almost always use anchored FADs to aggregate tunas and other neritic species. The subject of discussion here is anchored FADs used by artisanal fishers.

protected from vandalism, and c) monitored and maintained.⁵ Furthermore, severe weather such as cyclones, which are common in much of the region, can damage FADs beyond repair or result in them simply being lost. As populations increase in Pacific Island countries (PICs) and the capacity of reef ecosystems to contribute to per capita national dietary protein is increasingly constrained, the implementation of a national network of FADs to increase access to tuna and associated pelagic fish requires a long-term strategic approach that enshrines on-going support for FADs as a national priority.

Technical Study 3⁶ provides a detailed assessment of the current capacity of the 14 participating governments to manage FAD programs and recommends a two phased approach for the RTP: a) Strengthen or develop the governance structure necessary to support national FAD Management Plans for coastal fisheries to address gaps identified in the national FAD Program audits, and b) Implementing FAD Management Plans. This includes the purchase of FAD materials and other required equipment, training and capacity development, and strengthening data collection. This study identifies the additional steps required to consolidate the policy landscape using long-term financial mechanisms to sustain national FAD programs.

A situation analysis of the FAD programs and current financial models of the 14 participating countries was conducted (Appendix 2) and based on this, a list of key policy recommendations made that will be essential precursors for the long-term sustainability and finance of these programs. These include the need to elevate the priority of the FAD programs as nationally significant infrastructure, as well as complete and update comprehensive FAD management plans that will both help de-risk financial approaches to FAD fisheries as well as collect the necessary data to further structure investments on the fisheries and their long-term maintenance. Other measures to help de-risk and ensure the financial performance of the fisheries such as eradication of vandalism and better placement of FADs to withstand severe weather and improve catch rates are also recommended across the countries.

Different supporting financial mechanisms are assessed. These include on-going support from national recurrent budgets, bilateral and multilateral development assistance, loss and damage funds, public-private partnership (PPP) approaches, community cost share model, climate insurance, development of national funding sources such as local lending by banks or local bonds, as well as impact investment options. Their likelihood of success, timelines, associated risks and required expertise for each are assessed.

Annual maintenance budgets for national FAD programs are estimated to be in the range of USD 100,000-300,000. It is recommended that all the countries be supported to prepare a detailed FAD finance model that draws on a diversity of potential funding opportunities to provide on-going, sustainable support.

⁵Gillett, R. and McCoy, M. 2019. A Survey of Fish Aggregation Devices and Fisher Associations in Selected Pacific Island Countries. FAO and SPC. 75 pages.

⁶ SPC 2023, *Technical studies*. Accessed in November 2023. <https://fame.spc.int/technical-studies-support-funding-proposal-green-climate-fund-regional-tuna-programme>

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List of acronyms and abbreviations

AUD	Australian dollar
BPM	Blue Prosperity Micronesia
BOF	Bureau of Fisheries
CDF	Commodity Development Framework
COP	Conference of Parties
EEZ(s)	Exclusive economic zone(s)
ENSO	El Nino Southern Oscillation
FAD(s)	Fish aggregating device(s)
FAO	Food and Agriculture Organization (of the United Nations)
FAME	Fisheries, Aquaculture and Marine Ecosystems
FFA	Forum Fisheries Agency
FJD	Fijian dollar
FSM	Federated States of Micronesia
GCF	Green Climate Fund
IDF	International Development Finance
Kg	Kilogram
KI	Kiribati
Km	Kilometre
km ²	Square kilometres
M	Metre
MAF	Ministry of Agriculture and Fisheries
MIMRA	Marshall Islands Marine Resource Authority
MH	Marshall Islands
Mt	Metric ton (or tonne)
NCD	Non communicable disease
NFA	National Fisheries Authority
NFMRA	National Fisheries and Marine Resource Authority
NGO	Non-Government Organisation
Nm	Nautical mile
NZD	New Zealand dollar
PNG	Papua New Guinea
PGK	Papua New Guinea Kina
PICs	Pacific Island countries
PICTs	Pacific Island countries and territories

PNA	Parties to the Nauru Agreement
PNMS	Palau National Marine Sanctuary
RMI	Republic of Marshal Islands
RFP	Request for proposals
SMA	Spatial Management Area
SI	Solomon Islands
SBD	Solomon Islands dollar
SDG	Sustainable Development Goals
SPC	Pacific Community
SST	Sea surface temperature
TFD	Tuvalu Fisheries Department
TNC	The Nature Conservancy
TOP	Tongan Pa'anga
UN	United Nations
UNFCCC	United Nations Framework Convention on Climate Change
USD	United States dollar
VFD	Vanautu Fisheries Department
VGTA	Vava'u Game Fishing Association
VUV	Vanuatu Vatu
WB	World Bank
WCPFC	Western and Central Pacific Fisheries Commission
WCPO	Western and Central Pacific Ocean
WHO	World Health Organization
WST	Samoan Tala

1. Introduction

Climate change is adversely affecting the Western and Central Pacific Ocean (WCPO) large marine ecosystem, degrading its coral reefs and changing the distribution of tuna.⁷ The impacts on coral reefs are reducing the supply of reef fish and threatening the food security of more than four million people that live along the coasts of the 14 RTP PICs.⁸ The redistribution of tuna will have profound implications for national economies that derive as much as 70% of their (non-aid) government revenue from tuna fishing, thereby dramatically reducing basic social services that are essential to the resilience of Pacific Island people. The proposed RTP will 1) increase supply of tuna for domestic consumption as an adaptation to degradation of coral reefs and the resulting food insecurity for vulnerable populations; and 2) usher in the reforms needed to minimise the risks for citizens of countries with economies that are vulnerable to climate-driven redistribution of tuna.

One of the two priority areas of focus for the RTP is the increased supply of tuna from coastal tuna fisheries to Pacific Island populations. This will be a priority food security related aspect of the RTP as predictions show that reef fish supplies will decline as climate impacts progress and the climate-related redistribution of tuna stocks may negatively impact current industrial fisheries based incomes and the supplies of tuna from existing domestic fleets.⁹ In addition data indicates that urban populations in particular will be growing as the coastal reef fishery declines towards 2050.¹⁰ This leaves the region with increasing seafood demand and a widening gap in fish supplies. Hence there is an acute need to improve the productivity of the nearshore coastal and off-shore fisheries targeting tuna for the purpose of addressing national food security needs.¹¹

Although the use of FADs is well embedded in coastal artisanal fishing practices,¹² the history of the region's experience with FADs can be characterised as *ad hoc*. FAD deployment initiatives have generally not been supported by formal national policy, few national fisheries agencies have embedded support for coastal FADs in their recurrent work program and funding has largely been dependent on a range of sources of bilateral or multilateral development assistance on an opportunistic basis.

In addition, the deployment and maintenance of FADs several kilometers offshore raise issues associated with sea safety. Anchored FADs have a limited life span and may last less than a year unless they are a) properly built and anchored in the correct locations, b) protected from vandalism, and c) monitored and

⁷ Bell, J.D., Allain, V., Gupta, A.S., Johnson, J.E., Hampton, J., Hobday, A.J., Lehodey, P., Lenton, A., Moore, B.R., Pratchett, M.S. and Senina, I. 2018. Climate change impacts, vulnerabilities and adaptations: Western and Central Pacific Ocean marine fisheries. *Impacts of climate change on fisheries and aquaculture*, p.305.

⁸ Throughout "Programme" refers to the GCF Regional Tuna Programme. "Project" and/or "activities" are used to describe initiatives and actions within the Programme.

⁹ Bell, J.D., Senina, I., Adams, T. *et al.* Pathways to sustaining tuna-dependent Pacific Island economies during climate change. *Nat Sustain* 4, 900–910 (2021). <https://doi.org/10.1038/s41893-021-00745-z>

¹⁰Kiddle, KL 2017. Unpacking the Urban Agenda: Resilience Challenges and Opportunities. *Sustainability* 2017, 9(10), 1878; <https://doi.org/10.3390/su9101878>

¹¹ Here we consider "coastal" fisheries to be generally small-scale artisanal and subsistence fisheries that take place in small vessels using low-technology fishing methods relatively close to shore. "Offshore" fisheries generally occur in oceanic waters often using sophisticated fishing technology and relatively large-scale vessels.

¹²Gillett, R. and McCoy, M. 2019. A Survey of Fish Aggregation Devices and Fisher Associations in Selected Pacific Island Countries. FAO and SPC. 75 pages.

maintained.¹³ Furthermore, severe weather such as cyclones, which are common in much of the region, can damage FADs beyond repair or result in them being lost. As PICs populations increase and the capacity of reef ecosystems to contribute to per capita national dietary protein is increasingly constrained, the implementation of a national network of FADs to increase access to tuna and associated pelagic fish requires a long-term strategic approach that enshrines on-going support for FADs as a national priority.

FAD maintenance requires funding, management and implementation capacity, infrastructure such as support vessels, rafts and equipment for maintenance and public education and information campaigns. Ideally FAD programs should include a means to assess FAD utilisation, costs and benefits including catch monitoring and analysis to evaluate socio-economic and ecological impacts. All these tasks require both initial budgets for capacity building and infrastructure as well as recurring budgets for maintenance, program implementation and replacement infrastructure.¹⁴

The RTP proposes a comprehensive suite of strategic interventions directed at coastal FADs for the region to build on the lessons learned, progress made to date and to expand sufficiently to ensure adequate long-term term food security for the PIC populations. As opposed to previous FAD-related initiatives it will promote a more formalised, strategic, approach the design and implementation of national FAD programs on the basis that FADs have the potential to make a significant contribution to securing the protein requirements of increasing populations of PIC communities as climate-induced changes impact the productivity of nearshore reef-associated ecosystems on which these communities have traditionally relied.

Study 3 of the GCF proposal consultancies has made a detailed assessment of the current capacity of the 14 participating PIC governments to manage FAD programs, the gaps in the current implementation and an assessment on the number and types of FADs needed to meet the increasing food security needs. The report includes a detailed 7-year implementation program and budget, including personnel requirements and timelines. This Study discusses additional steps required to consolidate the policy landscape in support of long-term financial mechanisms to secure the sustainability of those programs.

The purpose of this Study, as stated in the SPC RFP¹⁵ is to assess the scope and need for the Governments of all 14 participating PICs to sustain strengthened national FAD Programs to increase access to tuna for the food security of coastal communities by:¹⁶

- Classifying FADs as part of the permanent national infrastructure for food security and incorporating National FAD Programs within ongoing National Development Plans and recurring budgets;
- Creating legislation to prosecute willful actions that result in destroyed or damaged FADs, or violate community- based FAD rules;
- Promoting models for community and industry engagement and ownership of FADs;
- Promoting transfer of fishing effort by small-scale fishers in coastal communities from coral reefs to tuna;

¹³ Gillett, R. and McCoy, M. 2019. A Survey of Fish Aggregation Devices and Fisher Associations in Selected Pacific Island Countries. FAO and SPC. 75 pages.

¹⁴ Gillet, R. 2023. Fish aggregating devices for small-scale fishers - The report of a study of FAD effectiveness in Pacific Islands countries. FAO. Apia.

¹⁵ SPC 2022. *Call for proposals*. Accessed in August 2023. <https://www.spc.int/sites/default/files/tenderfiles/2022-05/RFP22-3866%20-%20FAME%20-%20Studies%20to%20support%20GCF%20proposal.pdf>

¹⁶ SPC 2022. *Call for proposals*. Accessed in August 2023. <https://www.spc.int/sites/default/files/tenderfiles/2022-05/RFP22-3866%20-%20FAME%20-%20Studies%20to%20support%20GCF%20proposal.pdf>

- Including the importance of tuna consumption for improved nutrition in national programs to combat non-communicable diseases (NDCs) in rural areas, and
- Analysing the long-term costs of maintaining FAD programs and suitable sources of finance and mechanisms to sustain their ongoing costs.

A country-by-country summary of previous and current FAD-related programs is presented at Appendix 1. Section 2 presents a national FAD policy analysis that addresses the above first five points.¹⁷ It builds on existing studies, the recent (early 2023) country consultations that were supported as part of the early national engagement with countries on the design of the RTP together with material assimilated during national consultations related to Study 3.¹⁸ Section 3 presents the budgets required for the maintenance of the FAD programs and discusses different funding mechanism options to finance the sustain the programs in the long term.

2. FAD Policy Analysis

With the long but *ad hoc* history of FAD programs in the region, PICs have active but limited fisheries around coastal FADs. Many studies and reviews have been conducted over the years to assess FAD fisheries performance and propose improvements to FAD programs including ecological impacts.¹⁹

It is now generally accepted that national FAD activities are most effective where there is a national FAD program that is integrated into the government fisheries agency as opposed to a project that comes/goes with the availability of funding, pressure from fishers, or the availability of external FAD-related services. In addition, an ongoing FAD program within a fisheries agency allows for greater continuity of FAD work, in-house capacity building, successful technology transfer to staff and a formal mechanism for interaction with stakeholders. This can be supported directly through either government or non-government activities. With an established unit inside a national fisheries department, rather than a project with no permanent staff, there is potential for greater stability of funding.²⁰

As demonstrated in the country summaries (Appendix 1), the status of permanent national FAD programs, as opposed to projects varies widely between countries as does the state of their implementation. Study 3 conducted an in-depth analysis of the implementation status of the national FAD management plans using the SPC “matrix for assessing progress towards a sustainable national FAD program”. Study 3 used that analysis to design detailed country specific activity plans to support those programs under the RTP. In order not to replicate this very thorough report, this analysis focuses on the main policy actions that need to be taken to maximise the potential for the sustainability of the FAD programs at the conclusion of RTP support.

¹⁷ As a more detailed country profiles were provided in Study 3, this section only focuses on the key points above.

¹⁸ Additional information was kindly provided by Francisco Blaha and Robert Gillett.

¹⁹ Gillett, R. and McCoy, M. 2019. A Survey of Fish Aggregation Devices and Fisher Associations in Selected Pacific Island Countries. FAO and SPC. 75 pages.

²⁰ Gillet, R. 2023. Fish aggregating devices for small-scale fishers - The report of a study of FAD effectiveness in Pacific Islands countries. FAO. Apia.

For the benefit of this broader policy analysis and recommendations a summary of the main operational issues facing FAD program implementation across all the countries and detailed in Appendix 1 were as follows:

1. Incomplete national FAD management plans and programs;
2. Lack of regular budgets and finance models to ensure materials are available to quickly replace lost and damaged FADs (materials often program funded);
3. Lack of suitable vessels for FAD deployment and regular monitoring;
4. Lack of cyclone proof shelter for materials;
5. Vandalism, accidental damage, and community conflicts around FADs;
6. Lack of technology for improved deployment and monitoring of FAD effectiveness.

In terms of the policy improvements needed to ensure the longevity of the expanded FAD programs after RTP implementation, the above actions will need to be supported with priority policy and financial interventions. This will require the completion and revision as needed of the national FAD management plans together with the resourcing of those plans and a gradual transfer of the program responsibility from the RTP to the national administrations towards the end of the 7-year period.

At present national FAD Management plans or programs fall under the responsibility of the fisheries administrations although their legal requirement is determined country by country. Generally, national fisheries agency recurrent budgets only support labour and deployment costs of FADs. The bigger expense, the material costs of FADs are commonly provided for by short-term projects which leaves frequent budget shortages for timely replacement of lost FADs. In addition, this potentially leave a shortage of funding for other essential activities such as community socialisation and improved FAD deployment methods using electronic equipment. This can result in partial implementation of FAD programs, with higher rates of FAD loss and vandalism, as well as a general lack of data relating to their effectiveness and to provide information that can be used to improve deployment practices, usability and reduced ecological impacts.

In Vanuatu, Nauru and PNG the central government provides a recurrent annual budget allocation for the national FAD program. It is not unusual for this to be supplemented by occasional support provided by bi- or multi-lateral donor agencies. Vandalism is a major cause for lost and damage to FADs in many countries although experience demonstrates that where community education has been prioritised vandalism had been reduced significantly.²¹ Together with the consistent application of penalties for vandalism, continuous community engagement is a critical determinant for the success of national FAD programs.

To ensure long-term financing of the FAD infrastructure, all 14 RTP PICs should be encouraged to formally recognise the importance of the FAD infrastructure as a key component of national efforts to address food security needs. National FAD management plans need to be completed/ revised and elevated to the same level as other critical infrastructure strategies and policies such as roads, sanitation and hospitals. Formal government acknowledgement will be critical in securing the long term recurrent budgetary allocations required and to attract supplementary finance. It is also key in securing inter-government agency collaboration, which is a priority in terms of supporting national food security. Inter-agency collaboration could include the navy, coast guard and ports in relation to emergency maintenance and the use of port infrastructure in support of the FAD program, as well as provide a framework for the engagement of private sector and international donors in the national program. Embedding national FAD program support in the recurrent work program of national fisheries administrations will also provide a valuable

²¹ See Appendix 1 country consultations.

platform for broader engagement with the international donor community for complementary support (see below chapter 3).

The climate adaptation strategy for FADs in moving fishing effort from coral reefs was not widely discussed in the in-country consultations. Some countries noted that strategic FAD positioning together with the necessary training and equipment will help encourage fishers to move offshore. The possibility of allocating FADs to communities adjacent to threatened reef systems would provide compound benefits for both food security as well as overall reef resilience. There are many marine conservation programs active in the 14 countries that could be consulted early in the RTP to identify such locations in collaboration with community stakeholders. The safety, technology and training needs highlighted in the in-country consultations and detailed in Study 3 are essential components of the program when introducing 'new' fishers to more challenging offshore fishing conditions. The detailed safety requirements of the program are detailed in Study 12.²²

In terms of non-communicable diseases (NCDs) which are prevalent across the entire region and the impacts of which were severely exacerbated in the region during the COVID-19 pandemic, the availability of fresh seafood from FAD programs will play a positive role towards addressing the NCD epidemic. Health Ministries should be made aware of the increased supply of fish from FADs as a potentially significant contribution to efforts to improve dietary health and address threats to national food security. With their support, national planning authorities can help to elevate the expansion and maintenance of national FAD programs to increase nutrition and strengthen the suite of policies designed to address the prevalence of NCDs.

A summary of the status of key elements supporting a sustainable national FAD program in each of the RTP PICs based on the analysis presented in Appendix 1 is provided in Table 1.

²² SPC 2023, *Technical studies*. Accessed in November 2023. <https://fame.spc.int/technical-studies-support-funding-proposal-green-climate-fund-regional-tuna-programme>

Table 1: Summary of key FAD program gaps identified for each of the RTP PICs.

Country	Status of national FAD management plan / program	FADs classified as part of national infrastructure	All FAD costs including materials covered by national annual budgets	Routine monitoring and maintenance of FADs by government	FAD awareness training to minimise vandalism and community engagement
Cook Islands	FAD program with draft policy action plan	No	No, some donor funding for materials	1-2 months for maintenance based on location	No
Fiji	Draft FAD plan underway, but early stages.	No	No, some donor funding for materials	No regular maintenance	No
FSM	FAD program in Pohnpei but no overarching national plan	No	No, some donor funding for materials	1-2 months when there are FADs in the water	No
Kiribati	FAD program with draft plan that needs reviewing	No	No, some donor funding for materials	Maintenance 3-monthly where fisheries staff located, otherwise very infrequent	No
Nauru	Draft Nauru National FAD Strategic Development Plan	No	Yes	Monthly checking of FADs	No
Niue	Ad hoc, nothing drafted	No	No, donor funding for materials	Every 3 months	no (but no vandalism reported)
Palau	Internal management plan in place but not formalised	No	No, donor funding for materials	Every 3 months	No
Papua New Guinea	Starting work on an inshore FAD policy but early stages.	No	Yes	Ad hoc by government and also local community	No

Country	Status of national FAD management plan / program	FADs classified as part of national infrastructure	All FAD costs including materials covered by national annual budgets	Routine monitoring and maintenance of FADs by government	FAD awareness training to minimise vandalism and community engagement
				monitoring and fixing of broken FADs	
RMI	Have draft FAD management plan that needs updating.	No	No, donor funding for materials	Ad hoc with fishers reporting any damage	No
Samoa	Have a FAD management plan but this needs revising	No	No, donor funding for materials	2-3 times per year with limited funds.	No
Solomon Islands	Have a policy in place but needs review and updating	No	No, donor funding for materials	Do maintenance every 6 months	Yes, has had some impact (See Appendix 1) but more needed
Tonga	Have a FAD Policy and developing a FAD plan	No	No, donor funding for materials	Monitor and maintain on a quarterly basis	Yes, has had a good impact (See Appendix 1) but more needed
Tuvalu	Draft plan available and needs finalisation	No	No, mix of donor and national fishery agency	Once a year	No
Vanuatu	Has management plan	Yes to an extent as FADs have priority beyond fisheries department.	Yes, but some project funding components as well	Monthly maintenance by fisheries officers	Yes, has had a good impact (See Appendix 1) but more needed

2.1 Policy interventions to ensure investment readiness of FAD programs

The policy interventions described in Table 1 are prerequisites to securing sustainable long-term finance options for the program as explained in more detail in section 3 below. A well-regulated sustainable management environment within which the small-scale tuna FAD fishery takes place nationally will be an important prerequisite for any investment.

The lack of national FAD management plans and policies and evidence of capacities to efficiently implement them would make it difficult to meet many investment standards, whether it is public or private. For private investment, the actual financial details of the FAD fishing businesses and proof of business management capacities of FAD-related fishing enterprises will be the most important determining factors. However, the underlying financial viability of the fishing business will be supported by the policies outlined above in Table 1. The financial baseline will be impacted by factors such as vandalism and loss of FADs. Fishing rates, and financial performance, will also be impacted if damaged or lost FADs are not replaced in a timely basis. Hence policy interventions are a pre-requisite to the effective establishment of a national FAD program. In addition to technical support for deployment and maintenance, data collection functions are also critical to support assessments of the costs and benefits of the program and in supporting finance models and projections associated with seeking finance.

High government priority for the maintenance of coastal FAD programs with active monitoring of the use and status of FADs, a well resourced FAD maintenance and replacement program and capacity building support for the communities will further help to de-risk investments in FAD fisheries and can count as co-finance for the private sector.

A clear strategic government policy supporting FADs, supported by legislation and integrated to the program of work of national fisheries administrations will be critical to securing on-going allocations from recurrent government budgets. Clear government commitment demonstrated in this manner, which is the expected outcome of the RTP , will be critical to securing additional public and development sector support, including in terms of supplemental funding. Although not as necessary as the good economic performance of the fishery, this will also further help de-risk the investment for the private sector.

3. Financial analysis of the FAD program post GCF

3.1 Financial forecast of the costs associated sustaining national FAD programs

Study 3 compiled comprehensive budgets for the RTP FAD program for each participating country. Based on the findings of Study 3, an indicative recurrent budget has been prepared for each country (Appendix 2). These budgets will need to be revised during the early stages of the RTP based on:

- a) improvements made in FAD designs and programs impacting the longevity of FADs and associated impacts on recurrent budgets;
- b) re-estimates of the scale of the FAD programs needed based on more accurate/timely climate impact forecasting;
- c) dates on shared costs between fisheries departments and other involved government entities;
- d) partnerships or cost sharing arrangements with industry and/or communities, and
- e) inflation.

Table 2 presents the estimated annual recurrent costs of national FAD programs at the end of the RTP. ²³ Annual costs vary between USD100.000-300,000 annually. In order to prepare more detailed business and financial models as described in Section 3.2 below, an update of detailed cost/benefit data including

²⁴ This kind of on site and fishery specific financial modeling was out of scope of this study

market price information and current operational costs will be required for each RTP PIC early in the program.in the ²⁴

Despite many previous studies detailing FAD fishing practices²⁵, management²⁶ and investment needs,²⁷ this level of up to date financial and operational detail needs to be collected in each of the fishery locations with input from a business analyst who can develop detailed financial models at the start of the RTP. The numerous previous studies conducted in the region can provide useful historical catch and effort data, seasonal information and other details that are crucial in developing credible finance models. Section 3.2 below describes potential long-term financial assistance mechanisms.

Table 2. Cost estimate of the maintenance of the FAD program per country post GCF.

	Annual recurrent budget estimate (USD)	Annual estimate without cyclone proof housing upgrade (USD)
Cook Islands	198,889	153,889
Fiji	272,004	227,004
FSM	217,725	172,725
Kiribati	268,800	223,800
Nauru	171,216	126,216
Niue	172,140	127,140
Palau	236,100	191,100
PNG	271,680	226,680
RMI	210,100	165,100
Samoa	183,554	138,554
Solomons	247,428	202,428
Tonga	178,139	133,139
Tuvalu	198,495	153,495
Vanuatu	272,419	227,419

²⁴ This kind of on site and fishery specific financial modeling was out of scope of this study

²⁵ Sharp, M. (2011). The benefits of fish aggregating devices in the Pacific. SPC Fisheries. Newsletter, 135, 28-36. 53.

²⁶ Gillett, R. and McCoy, M. (2019). A Survey of Fish Aggregation Devices and Fisher Associations in Selected Pacific Island Countries. FAO and SPC. 75 pages.

²⁷ Bell JD, Allain A, Allison EH, Andréfouët S, Andrew NL, Batty MJ, Blanc M et al. (2015) Diversifying the use of tuna to improve food security and public health in Pacific Island countries and territories. *Marine Policy* 51:584–591.

3.2 Detailed description of potential financial mechanisms

3.2.1 Financing FAD programs as part of national infrastructure

If FAD programs are prioritised as part of national infrastructure needs as discussed in the policy section 2.1 above, their long-term maintenance and operational costs will be budgeted in the domestic budget in a similar manner to roads, ports, wharfs, hospitals and schools. Given the RTP will provide significant support over a period of 7 years, governments will need to plan and ensure the necessary means to sustain these programs in a highly competitive environment for limited government funds. There is currently no assurance that a national FAD program will receive the ongoing support required to continue to make a significant contribution to addressing national food security in the long term.

For the PNA countries, where significant income is generated through the Vessel Day Scheme (VDS) for purse seine fisheries, earmarking some of this income for the national near shore FAD programs would be a strategic investment. For countries where there is no VDS based income another way to safeguard necessary budgets is to earmark allocations within government budgets dedicated to FADs that are to be supported through international development finance. PICs are some of the most vulnerable countries to climate impacts in the world and are already faced with increasing annual costs as a result of the increased frequency and intensity of climate-induced extreme natural events. These impacts incur a significant cost to already vulnerable economies of PICs and the region will need serious ongoing international support to cope with these challenges. Future support should include dedicated attention to addressing national food security needs including through national FAD programs.

A summary of selected international development and climate finance options which offer potential for such support is presented in the following sections.

3.2.2 Loss and damage fund

There is increasing international recognition that the current ambitions for climate adaptation and mitigation may not be effective for managing the consequences of climate change and that developing countries, in particular, may suffer huge damage and losses due to increased climate impacts.

The Warsaw International Mechanism for Loss and Damage associated with climate change impacts (WIM) was established at the COP19 in 2013. The Paris Agreement further underlined the importance of this issue. All Parties are requested to develop and implement concrete and effective climate risk management instruments and measures to avert, minimise, or when the limits of adaptation are reached, effectively address residual loss and damage caused by climate-related extreme events and slow onset changes. The loss and damage discussions under the United Nation Framework Convention on Climate Change (UNFCCC) have been somewhat controversial and became the main focus of the negotiations at the COP27 in 2022 in Egypt where developed nations pledged an additional USD 230 million for the adaptation fund. However, this is still seen as widely insufficient.²⁸ At the COP28 in 2023 negotiations started towards a new fund for loss and damage and additional pledges were made towards it.²⁹

²⁸ UNFCCC 2023. *COP27 reaches breakthrough agreement on loss and damage*. Accessed January 2024. <https://unfccc.int/news/cop27-reaches-breakthrough-agreement-on-new-loss-and-damage-fund-for-vulnerable-countries>

²⁹ WRI 2023. *COP28 opening day operationalize loss and damage fund*. Accessed in January 2024. <https://www.wri.org/news/statement-cop28-opening-day-negotiators-operationalize-loss-and-damage-fund>

Given the already severe impacts of climate change being felt in the Pacific region, PICs and SIDSs in particular, are likely to be leading many of the negotiations on loss and damage and compensation processes to do with slow onset events and extreme weather events. Loss and damage to Pacific tuna and reef fisheries is likely to fall into the category of slow onset events, unless marine heat waves or other extreme events cause large, widespread and sudden damage. According to the UNFCCC loss and damage guidelines³⁰ there is a need for Parties to pursue ocean and fisheries-based mitigation and adaptation strategies as a first step, as the loss and damage fund is for unavoidable damage.

Funding support for FAD programs could fall under the slow onset events provision given reef fisheries are predicted to decline due to habitat changes caused by warming ocean temperatures and ocean acidification and national FAD programs are being put into place as an adaptation measure. When FADs and related infrastructure are damaged by extreme weather events compensation could be sought under the extreme weather events provisions. However, current processes are extremely protracted and are not responsive to the immediate needs associated with repairing damaged FADs and associated support infrastructure.

3.2.3 Development finance

International Development Finance (IDF) typically provide either grants or loans and the usual lenders in the region are the World Bank (WB), the Asian Development Bank (ADB) and other regional development banks and as well as many bilateral financiers. The IDFs usually have long-term programs in the countries and regions they support and the investment needs are evaluated within those programs. IDF investments are required to align with the UN Sustainable Development Goals (SDGs) as well as climate-related adaptation and mitigation targets as mandated by the Paris Agreement.

Roads, ports, renewable energy projects and cold chain infrastructure all fall within the usual scope of this kind of finance and can include national debt finance, grant components and blended finance. The RTP should engage ‘the Banks’ in considering the broader climate adaptation and food security needs in the region and how the proposed FAD infrastructure could be supported within these programs. Combining sectors and generic country needs (wharves, roads) could also help reach sufficient scale in terms of the financial amounts needed for this kind of finance, providing benefits that go beyond FAD infrastructure (or by-catch distribution) and assist with the capacity building needed for to secure the longevity of these projects and investments.

Although international development finance is not usually considered as a sustainable finance model, in this case if it can ensure regular budgets for FAD programs through dedicated budget allocations, then it is a long-term finance model.

3.2.4 Industry cost share, public private partnership (PPP) and SMEs

Although the RTP targets small-scale fishing and community-based food security needs, as opposed to providing facilities for corporations to expand their operations, there are opportunities for collaboration that have the potential to generate mutual benefits including by engaging industry to assist in the technical implementation of FAD programs.

³⁰ UNFCCC 2018. *Loss and damage guide*. Accessed in July 2023.

https://unfccc.int/sites/default/files/resource/Online_guide_on_loss_and_damage-May_2018.pdf

The Solomon Islands provides an example of successful PPP collaboration where a commercial fishing company uses its purse seine vessels to help deploy FADs for small-scale fishers.³¹ Given purse seiners manage large numbers of FADs on a regular basis, and that many fisheries administrations and communities lack suitable vessels for FAD deployment, making use of existing vessels active in the local area can provide significant cost savings.

Locally-based vessels or vessels visiting for transshipments should be encouraged to support national FAD programs as part of their corporate social responsibility (CSR) programs. As well as including this as a licensing condition, incentives for collaboration could include reduction in port fees, license fees or taxes. Companies active in the fishery in each participating country should be engaged to provide support with FAD deployments and assist, as required, in the event of emergencies associated with climate-induced extreme events. Countries are encouraged to consider including such obligations in national licensing arrangements for fishing vessels.

Sharing of FADs between small-scale local fishers with industrial scale vessels might be possible in some countries like Palau or the Solomon Islands where pole and line vessels or large handline boats are active. However, this may cause user conflicts on the FADs with commercial scale operations having the potential to adversely impact the catch rates and economic performance for small scale fishers. An alternative may be to assess the potential for introducing a 'levy' or fee for industry that would be used to support the on-going running costs of the national FAD program that is added to the licensing conditions and administered as part of the overall fishery access fee.

In addition, the role of SMEs in the FAD fishery should be assessed country-by-country as capable SME players maybe be able to expand their operations to benefit community-based fisheries or support local food security. SMEs are also more likely to attract private investment for scaling and often provide a more sustainable long term financial model than community-based approaches (see 3.2.7).

There are also possible opportunities for mutual benefits for small-scale coastal fisheries, SMEs and industrial-scale tuna fishing operations relating to cold storage and on-shore infrastructure. Future plans should examine the costs and benefits of infrastructure assets being shared across different users.³²

This approach does not require new capacity to develop and can be implemented nationally as part of the regular dialogue, licensing arrangements and cooperation with the private sector members.

3.2.5 Private FADs, community cost share and ownership model

In some other parts of the world, such as Indonesia, it is common that a private entity may own FADs and fishers who fish on these pay a user fee. This is usually done on a catch share basis. For example, 10% of the catch may be paid to the FAD owner. This means that each FAD is for private use and not all fishers automatically have access rights. A draw back from this practice in Indonesia is that it has led to a proliferation of FADs that are largely uneconomic. In the Pacific this approach might be difficult to implement as traditional ownership and shared resources and access within/between communities remains strong.³³ There is a risk that this approach could quickly lead to conflict and vandalism.

³² See also study 9, Part 2. Transshipment study

³³ Personal communication: Johann Bell 2021

Another approach could be a cost recovery/payment scheme for FADs which is based on a community ownership model. This model would involve a community or a local fishing association fully or partially owning FADs. They would pay for the FAD materials and either all or partial deployment costs, depending on the logistics and equipment required and the level of government support available. A user fee system, based on a fishing trip/catch share, administered by the association/or a community officer, could then be applied to cover the construction and deployment costs.

The government FAD program would then coordinate with the association or community officer in areas such as program maintenance and data collection to monitor both FAD utilisation and assessment of appropriate user fees.

Such an arrangement could still benefit and qualify for government or third-party support particularly if the association or community group was able to demonstrate that the FAD was a valued resource for local fishers. In situations where FAD fishing provides a positive income and is well socialised within the community with well quantified and communicated benefits, a shared ownership model warrants consideration.

The community/association share model has not been tested in the region to date, despite many countries voicing their intention to move towards 'cost recovery approaches' in the RTP national consultations. Some co-funding approaches were tried in Fiji where the 2000 Commodity Development Framework (CDF) FAD program was designed to subsidize fishers with new boats that could access FADs. Fishers funded 1/3 of the cost and Fiji Government funded the balance.³⁴ This program however ended up increasing the fishing pressure on the inshore areas because the fishers preferred to spear fish as opposed to use the FADs with the boats provided.³⁵ Such outcomes underscore the need for clear commitments from participating communities to the objectives of the FAD program and obligations that are associated with government or donor agency support for that program.

Implementation of the FAD component of the RTP will require early elaboration of the various financial obligations and commitments required of stakeholders. This will include consideration of long-term sustainable financing arrangements and FAD management responsibilities and obligations. A culturally appropriate stakeholder participation mechanism will be required to support this engagement.

This financing model does not require additional capacity by the RTP as it can be assessed and set up as part of national FAD program activities. It does not require complicated data beyond regular fisheries monitoring data and support for capacity-building locally.

3.2.6 Climate insurance

Parametric insurance is an agreement to make a payment upon the occurrence of a triggering event, and as such is detached from an underlying physical asset or piece of infrastructure. Parametric insurance development for the small-scale fishing sector is a rapidly developing subject area as coastal communities prepare for climate adaptation in the face of increasing risks. Parametric or index-based insurance products support transparent and fast claims payment and the ability to offer a payout without actual

³⁴ We were not able to obtain further details beyond what was mentioned in the country consultations.

³⁵ Gillet, R. 2023. Fish aggregating devices for small-scale fishers - The report of a study of FAD effectiveness in Pacific Islands countries. FAO. Apia.

physical damage to an asset. Parametric or index-based solutions are often considered when assessing hard to insure risks.³⁶ A parametric solution always consists of the following:

a. A triggering event

The insurance cover is triggered if pre-defined event parameters are met or exceeded, measured by an objective parameter or index that is related to a particular exposure to the insured party. In practice, this event could be an earthquake, tropical cyclone, or flood where the parameter or index is the magnitude, wind speed or precipitation respectively. Whilst Natural Catastrophes (Nat Cats) or weather events are the most prominent triggers, there are many other applications. The key criteria for an insurable trigger is that:

- (i) it is fortuitous, and
- (ii) it can be modelled.

b. A pay-out mechanism

A pre-agreed pay-out occurs if the parameter or index threshold is reached or exceeded, regardless of actual physical loss sustained. For example, USD 30 million if a Category 5 tropical cyclone occurs in a defined area, or USD 50,000 for every millimeter of cumulative rainfall above a certain threshold. The threshold is usually set in such a way that aligns with a client's own continuity plan, risk tolerance and capacity to pay the necessary premiums.

Any parameter or index that is used as the basis for a parametric solution must be objective (i.e. independently verifiable), transparent, and consistent. Generally, indices that are easily measurable and can be reported upon quickly and effectively are selected in order to ensure prompt pay out. It is important that neither the risk taker or the insured are able to influence the event or its reporting. This is why indices around weather and "Acts of God" are common in parametric insurance.

Some examples of agencies that monitor trigger events and respective parameters or indices:

- Hong Kong Observatory (HKO) typhoon warning signals
- Japan Meteorological Agency (JMA) seismic intensity
- US Geological Survey (USGS) earthquake magnitude
- Australian Bureau of Meteorology (BoM) tropical cyclone category

Parametric insurance products for the fishing sector include insurance products bought by the fishers themselves, fishing associations or others such the fish buyers or even the local government. The insurance payments themselves are triggered by climate events such as wave height, wind speed, and other weather phenomena and monitored by agencies such as those identified above that confirms that fishers are suffering climate and weather related losses (e.g. loss of fishing days due to rough sea conditions).³⁷ In the case of Pacific based FAD programs, certain triggers can be chosen that would confirm damage to FADs by tropical cyclones that would then trigger payments allowing for a quick replacement of FADs to minimise loss of fishing days for the fishers. So far there are no existing examples on FAD based

³⁶ SWISSRE. What is parametric insurance? Accessed in July 2023.

https://corporatesolutions.swissre.com/insights/knowledge/what_is_parametric_insurance.html

³⁷ ORRAA 2022. Pramaetric insurance for small-scale fisheries. Accessed in July 2023.

<https://oceanriskalliance.org/project/weather-index-based-parametric-insurance-for-small-scale-fishers/>

climate insurance but given other small-scale fisheries approaches are being developed this should be explored.

Given the ownership of FADs in the Pacific often sits with the government authorities, any parametric model needs to consider who the ultimate client is, and how possible insurance premiums are either collected from the fishers (possibly as part of the community ownership/cost recovery model) or paid by the government itself. The insurance design and data collection process will need to determine in detail how the premiums are calculated and reviewed as well as detailing payout mechanisms.

The Caribbean Catastrophe Risk Insurance Facility (CCRIF) is an example of regional parametric insurance product that is designed to offer earthquake, tropical cyclone and excess rainfall policies to Caribbean and Central American governments. CCRIF helps to mitigate the short-term cash flow problems small developing economies suffer after major natural disasters. CCRIF's parametric insurance mechanism allows it to provide rapid payouts to help members finance their initial disaster response and maintain basic government functions after a catastrophic event.³⁸ This kind of more generic climate risk and disaster related insurance mechanism could also be developed for the Pacific and include aspects of FAD post cyclone repairs and replacement budgets.

Climate insurance is a new and experimental area of work and it will require dedicated people with relevant insurance experience to develop. FAD fisheries already provide much data and relevant information but some additional data collection and modelling may need to be conducted as well. All require time, budget and expertise. This would take at least a few years to complete within the RTP and a minimum of USD200,000 of budget for data collection, modelling and necessary consultations and it would cost much more if separate insurance products are developed per country.

3.2.7 Innovative and impact focused finance mechanisms

As opposed to traditional investments that seek to maximise financial returns, impact investments are made with the intention of generating positive, measurable social and environmental impact alongside a financial return. Impact investments can be made in both emerging and developed markets and target a range of returns depending on investors strategic goals and priorities.

Although the blue economy concept has been explored at length by policy makers and investors, in practise only in recent years have actual deals and specific investors started to emerge that are actively structuring marine and ocean investments that contribute positive impacts to areas such as sustainable fisheries, technology transfer, marine protected area finance and eco-tourism. Investments supporting marine infrastructure, aquaculture, fisheries and waste management have been around for longer, but have not been addressing the hard issues around progressing actual marine conservation. Small-scale fisheries investments are also far and few between to date and have mainly focused on processing or technology.

Impact investments are generally in the range of USD1-10 million. In the context of PICs tuna fisheries climate adaptation needs, and FAD programs specifically, several smaller investments may need to be bundled into one larger investment to be viable. One such generic investment was made in Fiji to Matanaki Ltd, which received USD75 million for a program to invest in coral reefs and the Blue Economy, under

³⁸CCRIF. 2023. *Company overview*. Accessed in November 2023. https://www.ccrif.org/about-us?language_content_entity=en

which several small enterprises receive investment support.³⁹

There is significant scope for impact investment in climate mitigation, adaptation and marine conservation initiatives in the Pacific. An entrepreneurial approach with appropriate technical support from conservation and financial experts who assist with structuring these deals around desired conservation and social impacts contribute to the success of securing such investment. There will also be a need to develop de-risking measures through co-investments depending on the scale and complexity of the investments (from multilateral banks and others). In terms of FAD program financing, if for example, a suitable private sector partner to maintain and deploy FADs is identified, the approach could be incorporated in a bigger impact investment for the partner (processing, fishing vessels, wharves and associated infrastructure).

If the community payments model also works well, and can be proven to provide a sustainable income, it may be possible for a fishing association to form a company and receive impact investment for its FAD program. This would require evidence of good financial management, leadership and potentially, for some lenders, a blended finance approach to help de-risk the investment. As the broader Blue Economy initiative is developed in the Pacific to pay for ocean ecosystem services and support sustainable economies around it, a coastal community food security and FAD program should be kept under consideration. One such program has recently been announced by the GCF and focuses on the Blue Economy development of the Cook Islands, Fiji, PNG, Palau and FSM⁴⁰ and includes coastal livelihoods that could include FAD fisheries. Again, the precursor will be the financial cost and benefit information relating to FAD businesses, as well as the proper detailed definition of the specific fisheries on their social and economic contribution to community livelihoods and national food security.

There are numerous marine and blue economy focussed impact investment funds. One such fund offering significant potential for RTP PICs is the Global Fund for Coral Reefs (GFCR).⁴¹ The GCF contributes to the GFCR and the regional tuna Programme's FAD program is well aligned with the GFCR's objective to mobilise blended finance to protect and restore coral reefs. This is consistent with a co-benefit that will be generated under the RTP in moving fishing pressure from coral reefs to offshore.

Another fund that has recently made investments in sustainable tuna fisheries, MPAs, the blue economy as well as biodiversity conservation is Mirova,⁴² although their investment size is usually above USD 5 million, there could be interesting opportunities in tuna fisheries investments that could include FAD finance. In recent years, Mirova has invested USD 10 million into small-scale tuna fisheries processing improvements in Indonesia.

The Conservation International Venture Fund⁴³ is another conservation and blue economy focused fund that may be able to provide debt-based funding or advice. This program targets small enterprises and provides readiness finance (USD 200,000 - 500,000) which may appeal to some SME's as they prepare to scale and receive larger investments.

³⁹ Matanaki 2022. *About us*. Accessed in July 2023. <https://matanataki.com/portfolio/>

⁴⁰ Blue Co (document provided by GCF)

⁴¹ GFCR 2022. *Global Fund for Coral reefs intro*. Accessed in July 2023. <https://globalfundcoralreefs.org/>

⁴² Mirova 2023. *About us*. Accessed in July 2023. <https://www.mirova.com/en/about-us>

⁴³ Conservation International 2023. *CI Venture Fund LLC*. Accessed in July 2023. <https://www.conservation.org/projects/conservation-international-ventures-llc>

To date there have not been many impact investments into small-scale fishery FADs due to small investment size and/or the lack of investable companies globally. It will be a challenge to identify suitable SMEs or cooperatives that can provide the necessary scale and can handle this kind of investment. Especially in the PIC context, the opportunities may be few and far between and this opportunity should be approached perhaps as part of larger related investments into other supply chains and related infrastructure (perhaps transshipment by-catch related investments). The impact investment approach will require dedicated capacity in identifying and structuring the deals as well as ensuring the impact of these investments is meeting the required outcomes.

3.2.8 Mobilising local private investors

Local financial innovation is important and will bring a range of benefits for the region beyond the RTP and consideration should be given to building the awareness and capacity of local private institutions in "blue lending" and local bond issuance to attract local private investors. Private investors in PICs are risk-averse and not familiar with ocean finance.⁴⁴ One option for some countries would be to raise a local bond to cover a range of food security, health and sustainable livelihoods components. The recent Fiji green bond provides an example.⁴⁵ Most PICs have sovereign wealth funds that could be interested in investing in food security and fisheries provided it is supported by government legislation and guarantees and possibly insurance. The RTP should map the local lenders and assess their ability and interest to contribute to FAD program finance and long-term needs early during implementation. Expert support may be needed to help familiarise PICs with the blue economy lending needs and opportunities in providing new finance vehicles for this sector.

3.3. Summary finance recommendations

It is not practical to make country by country financial model recommendations, as all the countries need to prepare a detailed FAD finance model that will ideally consist of several different finance mechanisms. This is necessary to ensure the ultimate success in securing sustainable finance and the ability to respond to changing conditions and account for currently unseen risks and failures.

For example, it would be appropriate to begin planning for all potential sources of finance in most of the participating countries, with the view that there will be different mechanisms sharing the cost of the overall budget (see example Figure 1). Given the technicalities and skills required in the planning and implementation, regional coordination and support will need to be provided to avoid duplication of efforts. There is already some regional and national experience with mechanisms such as loss and damage finance, and international development finance so that FAD program long-term needs could be incorporated into those opportunities early during the implementation of the RTP.

PPP approaches and community-based fee/cost recovery models and their design supported by the right government policy and regulatory environment (as outlined in chapter 2) should be taken up as a priority in every country at the start of the RTP to review their suitability in more detail. In countries/fisheries

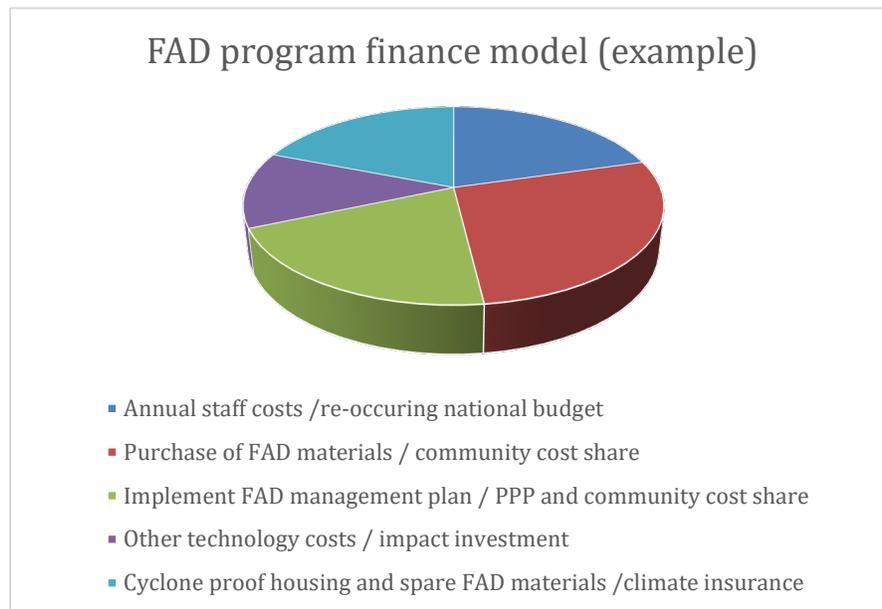
⁴⁴ UNDP 2022. *Demystifying green and blue bonds in the Pacific*. Accessed November 2023.

<https://www.undp.org/pacific/publications/demystifying-green-and-blue-bonds-pacific-region>

⁴⁵ World Bank 2017. *Fiji Issues First Developing Country Green Bond*, Raising \$50 Million for Climate Resilience.

Accessed in July 2023. <https://www.worldbank.org/en/news/press-release/2017/10/17/fiji-issues-first-developing-country-green-bond-raising-50-million-for-climate-resilience>

where these approaches provide potential, early engagement will ensure they are reasonably well established before the program ends. A focus on the development and capacity building of fishing associations as partners in the FAD programs is especially important.⁴⁶ These approaches will need the least amount of capacity building and new technical expertise and have high likelihood of success within the RTP time frame.



Climate insurance and blue economy focused innovative approaches should also be taken up with the regional agencies that can support the development of the additional skills and expertise required. Some regional agencies already provide support to their member countries in this field. It will take several years to research and structure this kind of mechanism as well as sufficiently pilot them to be able to support them regionally. These innovative finance options are also the riskiest endeavors due to their experimental nature, the need to develop investment opportunities and the large scale usually required for these instruments. They are not always successful and can have unforeseen consequences, that need to be prepared and mitigated for. As a result, it is prudent to develop these initiatives in parallel with other less risky approaches.

The RTP should also review the local lending sector and their knowledge and ability to invest in the blue economy. Depending on the assessment and the needs and opportunities arising, the RTP can provide specific knowledge-sharing and capacity-building activities to help forge new local finance mechanisms that can help support FAD programs and other regional development needs including the transshipment infrastructure needs.

A rapid assessment of the financial options is presented in Table 3. They are subjectively ranked according to the likelihood of success, a timeline of implementation, innovation/risk involved and additional capacity needs for the approach. The analysis shows that the PPP approach as well as national budgets supported

⁴⁶ Gillett, R. and McCoy, M. (2019). A Survey of Fish Aggregation Devices and Fisher Associations in Selected Pacific Island Countries. FAO and SPC. 75 pages.

by international development finance are the most likely to succeed in the short to medium term. Other mechanisms may have potential also but are riskier and require additional expertise and longer timelines of implementation.

Table 3: Comparative analysis of the different finance mechanisms

Investment mechanism	Likelihood of success	Timeline of implementation	Innovation and associated risk	Additional expertise requirement
Re-occurring national budget/development finance	high	medium	low	low
Loss and damage funds	low	long	low	medium
Community cost share	medium	medium	low	low
Public private partnership approach	high	short	low	low
Climate insurance	medium	long	high	high
Impact investment	medium	medium	high	high
Mobilising local investors	medium	medium	medium	medium

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Appendix 1: Summary of the current coastal FAD situation by country

Cook Islands

Current FAD program

The Cook Islands has an extensive FAD program with 28 FADs active. Of these 12 are in deep water (1,200m) and 16 in shallow water (250-300m). Three islands do not currently have FADs. The lifespan of the FADs is 1-3 years with an average of 1.5 years. FADs deployed in shallow water were reported to last as long as FADs set in deeper water. The Ministry of Marine Resources (MMR) endeavors to inspect/maintain the FADs once a month in Rarotonga and Aitutaki and on outer islands every 1-2 months. Coral growth on ropes after a month is the main issue that requires attention during maintenance. If the FAD is lost/damaged it can be replaced within a month if materials are available in Rarotonga and Aitutaki. On the outer islands the replacement takes longer as the materials need to be transported there. FADs are sometimes damaged by fishers with gear tangled on the mooring lines, some vandalism also occurs and it is suspected that shark bites can also sometime damage FADs.

Current supporting policies

Cook island has a national FAD program however it does not at the current time have a comprehensive national FAD policy. There is a need to endorse and implement a FAD policy or regulation to manage FAD fishing activities and to address conflicts relating to FAD use. In addition to the need to establish a policy there are needs around equipment for storage and deployment of FADs as well as regular supply of materials, improved FAD location design through technology and improved community engagement for FAD monitoring and data collection.

Current costs

The costs of the FADs vary between deep water FAD; NZD \$7,200 and shallow NZD \$5,800 in Rarotonga and Aitutaki. Plus \$1,000 for PVC pipe (150m long) for new FADs. For the Southern group the prices are \$9,900 and Northern group \$14,800 due to higher material and transport costs. The prices include travel costs for a FAD technician to oversee installation.

Current financial models

FAD deployment and maintenance costs are currently shared between funding provided by various donors and from the national budget. The port authority tug boat is used for deployment and includes covering fuel costs. There is a need to invest in a barge in the future to support deployments and maintenance. There are no private FADs although a private donor did fund one FAD once, no other financial models or cost sharing arrangements are currently in place. It was mentioned in the consultations that cost sharing between the islands could be considered in the future.

Other

In-country consultation indicated that the local fishing communities are keen and willing to transfer fishing effort from reefs to off-shore as part of the FAD implementation program. This will need to take account of safety and technical support as well as consideration of fishers and communities traditional fishing knowledge.

No information on the national plans to promote tuna consumption to combat non communicable diseases (NCD) was obtained in the consultations. There is an ongoing action plan 2021-2025 on the

prevention of non-communicable diseases⁴⁷ and it should be investigated how to integrate the tuna consumption issue into the program as part of the FAD fishery expansion and RTP activities.

Fiji

Current FAD program

Fiji has 22 active FADs as follows: four in the East, two in Kadavu, two in Lau, one in Rotuma, one in central, seven in Northern and five in Western part of Fiji. Most are in around 50m depth, Kadavu has one deeper at 180m. There has been many more FADs deployed but most were lost to cyclones and not yet replaced. The average life span of a FAD is 1-2 years (Eastern). The Ministry of Fisheries (MoF) carries out limited FAD monitoring with no regular maintenance. There is some vandalism with floats taken and some boats tie up to the FADs to fish, which can also cause damage.

Current supporting policies

The MoF began their FAD work in the 1980s to support the pole and line fishery and small industrial purse seine sector. In 2001, the FAD program was revived through the Commodity Development Framework (CDF) and scaled up across Fiji. While consultations, data sharing, and collaboration with other pertinent Ministries such as the Fiji Navy and the Maritime Authority of Fiji need to be strengthened, as well as operationalizing a centralized FAD management unit and FAD management plan, there are also strengths and ambitious plans to add value to ongoing activities including scaling up the FAD network and prioritizing locations most vulnerable to climate change. The MoF has identified four key priority areas necessary to accomplish this work: monitoring and maintenance, impact analysis for fishers around FADs, operationalizing a FAD Management Unit and finalizing a FAD Management Plan.

Current costs and financial models

The FADs cost FJD \$2-5,000 depending on depth and quality of materials with deep FADs costing up to \$10,000. The Fiji Government funds the FAD program but materials are funded by different projects, which means they are not replaced until there are new project budgets available for materials. In the East there are also NGO budgets for some FAD programs. The earlier CDF FAD program was designed to subsidize fishers, with fishers funding 1/3 of cost and Fiji Government funding the rest.

There are annual investments towards the National FAD program but the amounts vary from year to year and there has not been an accurate costs and needs assessment to ensure the budgets are properly justified as well as adequate. No other financial models were reported as part of the consultations.

Other

The focus of the previous CDF program was around encouraging fishers to fish around FADs for tuna to reduce fishing pressure on reef and lagoon resources. Consultations did not cover information on current programs to encourage fishers to move offshore from reef fisheries. There needs to be a more detailed assessment on the key reef areas vulnerable to climate impacts and coordination with the expanded FAD program so that it will help remove fishing pressure from these priority areas building on the lessons and success of the CDF program.

⁴⁷ [Cook Islands NCD plan](#)

The consultations did not touch on the NCDs programs and tuna. However, the issue of NCDs is severe in Fiji and this was exacerbated by the Covid-19 pandemic.⁴⁸ Preventing disease is a major focus on Fiji health services and early engagement with them during the GCF program should ensure FAD program integration.

Federated States of Micronesia

Current FAD program

The Federated States of Micronesia (FSM) coastal FAD programs are organised by the States and not by the Federal Government.

The Pohnpei State currently has two FADs, one in 500m and one in 1,000m. Both were deployed in 2020. They also have nine smaller lagoon FADs in 50m for attracting scads and bait fish. The FADs were reported to last up to seven years. Maintenance is conducted two times per month when the coconut leaf aggregators are replaced. Currently the state has materials in storage to replace lost or damaged FADs quickly. Vandalism was an issue before but better collaboration with communities has mitigated this.

Kosrae State currently has no FADs and the last deployment was in 2017 (four FADs) and the FADs lasted only a few months before fishers cut them off. The costs were similar to Pohnpei State and they were maintained every other month but there has been no budget or materials to deploy more since they were lost.

Chuuk State deployed 17 FADs between 2015-2017 and all were deployed within the lagoon of Chuuk and some outer islands. They were shallow in 30-70m depths and mainly subsurface. Eight of these FADs are still in place, the rest were damaged by typhoons and not replaced as the materials were provided by SPC as one-off donation. As these are lagoon FADs, no tuna is currently caught, only rainbow runner and other inshore pelagics. The markers flags were cut off after a couple of days due to vandalism. There is no real maintenance as the FADs are subsurface.

Yap has no active FADs at the moment. The last 3 FADs were deployed in 2018 around 4 miles off the coast in around 1,000m and lasted 1-2 years. Maintenance was conducted every couple of months in the past. Mainly replacing flags and aggregators. It is not clear why the FADs were lost, vandalism or natural wear and tear. Can only replace them when there is specific project funding again.

Current supporting policies

There is a FAD program in Pohnpei, but nothing comprehensive in place nationally. Small-scale fisheries projects within 12-24 miles need to go through National Oceanic Resource Authority (NORMA) for permitting although the FAD projects are at the state level.

Current costs and financial models

For Pohnpei state FADs cost USD 7000 for materials and anchors and a charter vessel for deployment is USD 10,000 a day. Material costs are from donors and national government and some NGOs cover the deployment costs. NGOs are also purchasing materials for communities that they use for the lagoon FADs.

⁴⁸ [Fiji NCD plan link](#)

For the other three states there are only project-based materials funding and state based deployment funding but these are not regular budgets. The current costs are also not clear but likely similar to Phonpei costs.

Other

Consultations in FSM did not cover information on current programs to encourage fishers to move off shore from reef fisheries. A more detailed assessment is needed on the key reef areas vulnerable to climate impacts and coordination with the expanded FAD program so that it will help remove fishing pressure from these priority areas. There are several parallel programs that may provide a framework for this such as the Blue Prosperity Micronesia (BPM) multi-year program to strengthen nationwide efforts towards conservation and management of fisheries resources as well as the ongoing National Government led program with the overarching goal to protect 30% of FSM's EEZ by 2030.

FSM has a national strategy on the prevention of NCDs that includes actions on food such as ensuring affordable fresh food items and subsidies to farming to allow for wider up take of healthy food.⁴⁹ It should be possible to collaborate with the health authorities in promoting FAD caught tuna as part of the activities under healthy food. A comparison of imported seafood and locally caught fish prices may need to be made to ensure the FAD caught tuna price is not prohibitive.

Kiribati

Current FAD program

There are currently four FADs around South Tarawa, eight FADs in Southern Islands and around 35 in in the Gilbert Islands. There are none in the Line Islands. Most FADs are deployed in around 300m depth and generally have a short lifespan with most are lost within eighteen months. The coral atolls have strong currents, steep slopes and a concentration of sharks in a small area that all take their toll on the FADs.

The Ministry of Fisheries and Marine Resource Development (MFMRD) has a FAD monitoring plan and the FADs are checked every three months on the islands where there are fisheries officers, on other islands there is no maintenance nor monitoring. Fishers in the Southern Islands monitor the FADs when fishing around them. Lost FADs are replaced close to Tarawa in 2-3 months but on islands further away it can take 3-4 months and on the Line islands this can take up to 1-2 years. Some vandalism has been reported near Tarawa as fishers have taken the floats. Very little vandalism in the outer islands.

Current supporting policies

Kiribati has an active FAD program but a comprehensive FAD management plan is still in development and review phase. Consultations mentioned that community engagement requires more focus so that they can better monitor their own FADs on the outer islands without fishery officers. Communities can also engage on all aspects of the fabrication, deployment and maintenance of FADs. In addition to community education, the MCS team monitoring and enforcing the existing regulations around FAD vandalism need strengthening and overall FAD program monitoring requires improvement to include catch and effort related data.

Current costs and financial models

The FAD cost is around USD 3,500 for FAD materials and anchor plus deployment costs. Deployments costs are very expensive, especially in the outer islands. A container of materials for 15 FADs costs AUD 40,000. Current funding is based on project finance and some government budgets with the FAD materials

⁴⁹ [FSM NCD national strategy](#)

mainly donor funded. Some Islands also have more long-term project finance for FADs. There are no private FADs or other finance models in use, all are government owned and free access to all fishers.

Other

Although no ongoing programs to replace reef fisheries with off-shore FAD fishing were mentioned in consultations, it was highlighted that inshore FAD made of local materials were piloted just outside an MPA to support communities and compensate them for the loss in their fishing grounds. This was trialed in one the islands and the MFMRD is seeking to clarify the success of this inshore FAD and how this could support communities. There should be opportunities for the RFP program to collaborate the FAD program implementation with these efforts to support community and MPA implementation.

NCD programs were not discussed in the consultations but Kiribati does face a severe NCD health burden. International organisations such as Doctor's Without Borders are active in the country and assists the government in planning and implementation of remote island work.⁵⁰ The RTP should engage with the health authorities to coordinate the FAD program with the outreach to communities at risk.

Nauru

Current FAD program

Currently Nauru has two offshore FADs at 2,400m of water. Previously they also had seven inshore FADs in 300m but they have all been lost now. The FADs last four years on average with some lasting up to 10 years. There is monthly checking and maintenance and the replacement of lost or damaged FADs depends on available materials. In general it can take six to 12 months for replacements. Some vandalism takes place mainly by breaking the flag and flagpole when fishers tie on the FAD and the added weight of having boats tied to the FAD has caused FADs to come loose and lost.

Current supporting policies

Nauru has a draft National FAD management plan that needs finalising. There are challenges in maintaining a stockpile of FAD materials for replacement. There is also a need to provide The Nauru Marine Resources and Fisheries Authority (NFMRA) with access to a suitable vessel for deploying FADs, together with FAD designs that are easier to deploy from small boats. It was also mentioned that monitoring of catch rates around FADs to improve the locations selected for FAD deployment and FAD design over time is needed. In addition, there are technology needs to equip FADs with acoustics to assess the number of fish underneath with information conveyed to fishers using mobile phone application.

Current costs and financial models

It costs between AUD \$5,000 to \$7,000 for inshore FADs and \$7,000 to \$15,000 for offshore depending on deployment depth. The cost for deployment is additional AUD \$5,000 per FAD. NFMRA budget covers all costs and sometimes there is some one-off donor funding of materials. There are no privately owned FADs around Nauru or other finance mechanisms to cover costs.

Other

Consultations in Nauru did not directly discuss programs to move fishing pressure from reefs to offshore but a number of actions were highlighted as required to encourage the use of FADs by community. These

⁵⁰ [News Article Kiribati NCD plan](#)

include workshops, training and ongoing dialogue with NMRFA and fishers to educate, train and continuously improve fishers use of the FADs. The revival of the local fishing association was also mentioned as a key to success of the FAD program and the uptake of FAD fishing.

In terms of NCDs Nauru has an active health program supported by Taiwan to grow fresh food⁵¹ and up to 2020 there was an active WHO supported national strategy. The RTP should engage with the health ministry to understand current strategic efforts and overlaps with the FAD program.

Niue

Current FAD program

Currently Niue has four offshore FADs (800-1000m), six inshore FADs (300-400m) and six shallow FADs for baitfish (15-30m). The life span of the FADs relates to cyclone frequency but is generally 4-5 years on average. There is no reported vandalism and it was reported that only whale entanglement and cyclones impact FADs.

On average FADs are maintained every three months. During the routine inspection the top part of the mooring is checked, coral growing on ropes removed and coconut fronds for aggregators replaced. If a FAD is lost it can take 6 months or more to replace depending on the availability of materials and access to the government boat and lifting gear to get the concrete blocks on board for deployment.

Current supporting policies

Niue's Ministry of Natural Resources (MNR) has national FAD program but no comprehensive management plan has been drafted. There is a need to have improved arrangements for the use of a suitable vessels to deploy and maintain FADs at short notice to ensure the FADs are always operating as a basis for food security. There is also a need to have a regular supply of materials for quick replacements and repairs, as well as higher quality depth sounders for accurate FAD site surveys for mooring deployment resulting in extended FAD working life. There is also a need to improve catch and effort monitoring and associated technology. In addition, the wider community is keen to be more involved in site selection, monitoring and FAD program design. A concern to solve problems with marine mammal entanglement before the program expands was also noted.

Current costs and financial models

Inshore FAD costs around NZD \$5,000 and offshore around NZD\$10,000 each including deployment costs. The costs are covered with a mix of core government and donor funding and in-kind contribution with use of the government boat for deployment and inspections. There are no private FADs or finance models in place.

Other

Active programs to move fishing away from reefs were not discussed in the country consultation but there were suggestions to encourage community use of offshore FADs. These included placement of FADs close to the coast so that they can be accessed with non-motorised 'vakas' as well as designating some FADs for spearfishing. It was also suggested that each community should have a off-shore FAD as well as a suitable boat for accessing it.

⁵¹ [Nauru NCS news article](#)

In terms of NCDs, no information on current active programs in Niue were found, but the GCF program should engage with the health ministry as a priority to incorporate the FAD program design with the best approaches on NCD prevention.

Current FAD program

In Palau the Bureau of Fisheries (BOF) deploys and maintains coastal FADs. Currently there are two on East, and five on the West side in depths ranging from 1500 - 2600m which is between three to seven miles off the reef. The FADs are inspected every three months and repairs made if materials are available. Lost and damaged FADs are regularly replaced. The lifespan of a FAD is usually 3-5 years, aside from weather related wear and tear . FAD vandalism and damage from boats mooring to FADs is a concern.. The Palau Sports Fishing Association also deploys coastal FADs with assistance from BOF.

Current supporting policies

The BoF has a FAD Strategic Plan (2020-2023) which is due to be updated and can take account of the priority activities expected to be supported by the RTP. The following items were highlighted as items for the updated plan:

- Establish data collection on catch and market data;
- Institutionalize a monitoring process to support the National FAD program;
- Prioritize more reliable data collection on FAD catch and effort, location and the reasons for FAD disappearance;
- Establish a FAD central database;
- Establish/update rules and regulations for FADs: regulate access and/or effort;
- Institutionalize fishery-independent monitoring;
- Install sat link buoys on all deployed FADs;
- Enhance catch/effort and market data collection;
- Create a national framework to define the program and establish sustainable financing mechanisms to ensure the program continuity;
- Deploy 10 FADs in selected sites;
- Stock up on FADs replacement materials;
- Invest in updated design for large scale FADs (Japan design, up to 10 year lifespan, little to no maintenance required);
- Scale up FAD fishing training for fishers in priority communities;
- Continue to provide safety gear to fishers as incentives for BoF data collection;

In addition, community consultation in Palau highlighted that The Nature Conservancy (TNC) is supporting BoF to trial utilization of an Eco Buoy with satellite links to monitor the biomass around a FAD in the North. The data collected will be used to inform fishers on fish biomass around the FAD and will help detect any movement or changes in FAD location. There was also suggestion to refine the laws and regulations regarding protection of FADs from vandalism and to provide more incentives for fishers to participate in data sharing and collection.

Current costs and financial models

The deep water FADs cost upwards of USD \$10,000 depending on material prices with deployment costs by a tug boat or barge comprising around USD \$4000-6000. The smaller shallow water FADs are cheaper at between USD \$4000-5000 including deployment by aBoF vessel. FAD construction and maintenance

costs are funded by both program and BoF core funds. The Palau Sports Fishing Association does not directly charge for the use of their FADs but has an association fee.

Other

In Palau there are active programs engaged in supporting the Palau National Marine Sanctuary (PNMS) which includes efforts to protect reefs and encourage fishing offshore. Discussions on a detailed FAD program between national authorities, communities and PNMS representatives are required.

Consultations did not cover recent NCD actions and the RTP should engage with the health ministry as a priority to incorporate FAD program design with the best approach on NCD prevention.

Papua New Guinea

Current FAD program

Since 2021, Papua New Guinea (PNG) has deployed 15 FADs in each of the five provinces with 75 in total. The current number of active FADs as of February 2023 was uncertain as some have been vandalised or lost. All the FADs are deployed in 200-400m last at least 2 years if not vandalised. Vandalism is usually the result of community conflicts over FAD access. FADs are rigged with communities who also carry out monitoring and maintenance on ad hoc basis. The National Fisheries Authority (NFA) provides FAD maintenance materials and orders enough materials for 75 FADs per year for distribution to the provinces. Some communities also deploy their own FADs using local materials.

Current supporting policies

The NFA has a national FAD program and is interested in expanding and strengthening it to a comprehensive FAD management plan. Consultations highlighted the need to strengthen the community programs and education to reduce vandalism, as well as improve the deployment, design, technology and FAD monitoring to improve longevity and productivity. There are also ecosystem interactions that need attention and change in design/locations. The lack of cold chain in landing locations is acute in PNG and community solar ice makers and stores were highlighted as necessary with expanded FAD program.

Current costs and financial models

FAD materials cost around PNG Kina 8,000-10,000 per FAD with shipping to the provinces costing PNG Kina 60,000-70,000 for 15 FADs. Deployment costs, hire of boats, staff travel costs and accommodation add to costs as the deployment trips can take a month in some provinces. The NFA is currently fully funding the program with an annual budget of PNG Kina 1.5-2.2 million. Some provinces provide some cost sharing by providing fuel for deployments and some communities put out their own FADs with funding assistance from their local member of parliament. In addition, some NGOs are assisting one or two communities with FADs. There was a suggestion that user conflicts could also be managed by introducing a FAD user 'levy'.

Other

There were no other activities focused on reducing fishing effort on reefs discussed but community consultations mentioned that this is a key strategy in ensuring long-term food security. Once the RTP commences environmental programs focusing on reef health and MPAs should be consulted to ensure strategic placement of FADs to account for reef health and conservation. Community consultations also mentioned the importance of fresh fish from a health perspective and relevant NCD educational and health promotion programs should be consulted early in the RTP to identify synergies and overlaps.

Marshall Islands

Current FAD program

Currently the Republic of Marshall Islands (RMI) has nine active FADs out of 18 deployed in recent years. These are in depths ranging from 1,200 to 1,400m and are 1-2 mile off the coast with one in deeper water around 4-5 miles off coast. The average life span of a FAD in RMI is one to two years with several lasting longer if a good location is found for anchoring. Fishers are asked to check FADs when fishing around them and replace coconut fronds. The Marshall Islands Marine Resource Authority (MIMRA) does some maintenance on an ad hoc basis. There is no current program to replace FADs on the outer islands but near Majuro some replacements have been done every two years with SPC assistance. There are some reports of vandalism but no proof and it is possible some FADs are cut off by boats that accidentally run over them. There are also reports of some shark bite like damage but no proof this has had an impact.

Current supporting policies

The Marshall Islands has a FAD management plan but it needs updating.

Current costs and financial models

Materials cost around USD \$3,000 for one FAD including the anchor. Deployment costs near Majuro are around USD \$600 and for outer islands around USD \$5,800. MIMRA funds deployment costs with donor support covering materials. No privately owned FADs or payment mechanisms in place but this has been discussed as possible in the future.

Other

Consultations in RMI did not discuss other programs and initiatives to move fishing effort from reefs. The RTP should engage the government and marine conservation programs to obtain further information and to identify overlaps and opportunities.

RMI is currently planning a new NCD strategy for 2025 onwards and SPC is leading this strategy development which should provide good opportunities for identifying synergies and opportunities between the programs.⁵²

Samoa

Current FAD program

Samoa has five active FADs and all are in 500-1000m of water. The FADs last three to four years on average and are inspected 2-3 times per year. There are limitations on funding for maintenance. If a FAD is lost or damaged, replacement will depend on the availability of materials and funds to support replacements. If materials available this will take around six months, possibly even a year and if no materials are on-hand and budget needs to be found. Some vandalism issues were reported, especially the flag and flagpole getting taken and boats tying up to FADs and adding stress to the mooring.

Current supporting policies

The FAD management program is one of the key priorities of the Fisheries Division of the Ministry of Agriculture and Fisheries (MAF). The program requires updating and consultations identified matters such as cyclone proof materials storage, catch and effort monitoring and community engagement and education.

⁵² [RMI NCD program](#)

Current costs and financial models

FADs are designed according to FAO principles and cost NZD \$10,000 to 15,000 each. Materials are funded by projects/donors and deployment costs funded MAF. The FAO FishFad project, the Pilot Program for Climate Resilience (PPCR) and another small-scale fisheries project have helped support and maintain the Samoa FAD Program. In addition, the Samoan International Fishing Association deploy FADs for fishing competitions that are self-funded. The development of a cost recovery mechanism was mentioned as a potential source of sustainable finance.

Other

During consultations the importance of village-based fisheries management committee's involvement in FAD programs was highlighted and also the need to coordinate strategies to help transfer fishing pressure from reefs.

In terms of NCDs there is an ongoing WHO and World Bank (WB) program to deliver better NCD information and care at the community level⁵³ and the RTP should seek early engagement with authorities and programs to promote fresh fish protein in NCD prevention.

Solomon Islands

Current FAD program

The Solomon Islands (SI) has 46 active FADs all around the country, at 100-500m depths with an average life span of 3-4 years. FADs are monitored for maintenance every 6 months and if damaged or lost replacement depends on the availability of budget and materials and funding for this was included in the 2023 budget. FAD sabotage is a problem and is usually due to issues associated with community ownership and fishing boundaries relating to traditional marine tenure system. The Ministry of Fisheries and Marine Resources (MFMR) has undertaken mitigating community education and there have been trials to use subsurface FADs to avoid vandalism.

Current supporting policies

The MFMR has a National FAD program and a FAD management plan that is due to be updated. The current plan covers installation and maintenance of FADs. All communities with local area FADs have a FAD Committee. Consultations noted the need for additional FAD materials and access to suitable deployment vessels with better echo sounders and bathymetric information for deployment. Improved data collection and monitoring to optimise FAD locations, designs and overall program management was noted as well as a new FAD design to reduce any potential impacts on mammals, turtles and birds. The development of strengthened the policies and education to mitigate vandalism is also a consideration.

Current costs and financial models

The FADs cost SBD \$80,000 each including deployment costs with half for materials and the other half for deployment which includes freight, travel costs and boat hire at the deployment location. FAD material costs are donor funded and MFMR also provides core funding. There are also NGO deployed FADs using local materials for the buoy system. The National Fisheries Developments (NFD) has an active program deploying both industrial and coastal artisanal FADs as part of their corporate, social responsibility (CSR)

⁵³ [Samoa NCD program](#)

and the government would like to see this expanded. The need to ensure recurrent MFMR budget to cater for increased community FAD demand was also noted.

Other

Consultations noted the need for the Community-Based Resource Management (CBRM) Section within MFMR to raise awareness of the decline in coral reef fish resources and the need to promote tuna consumption for good nutrition.

There is a national strategy to address the NCD burden that includes healthy nutrition and education⁵⁴ the RTP should seek early engagement with this program to identify synergies in approaches.

Tonga

Current FAD program

Tonga currently has 17 active FADs with 5 in Tongatapu, 4 in Eua, and 8 in Vava'u. FADs are moored in a range from 200 - 1,000m in depth and last 2-5 years on average with several examples of a 5-7 year FAD life. The Ministry of Fisheries (MoF) undertakes quarterly and post-cyclone monitoring and maintenance. Replacement is subject to the availability of materials but usually within six months. Aside from cyclone and current related losses there has historically been some vandalism but this has diminished as communities understand the importance of FADs, especially in special management areas (SMAs).

Current supporting policies

The MoF has a FAD policy and a National FAD management plan is in development. Consultations noted needs for technology upgrades to allow for real-time monitoring and site surveys and better fisher catch and effort data collection as well as a need for cyclone proof housing to store materials and access suitable boats for deployment.

Current costs and financial models

FADs cost Pa'anga \$5,000 for shallow water and Pa'anga \$30,000 for deep water (700-1200m). The MoF funds FAD monitoring with donor funding covering materials and deployments and the Vava'u game fishing association (VGFA) have their own self-funded FADs.

Other

Consultations in Tonga did not discuss opportunities and program overlaps for reducing fishing effort from reef areas vulnerable to climate change and the RTP should seek early engagement with the relevant environmental programs and authorities to identify program synergies.

There are active NCD focused programs involving healthy food and education and these programs should also be engaged early in the RTP to identify overlaps and synergies with the FAD program.⁵⁵

⁵⁴ [Solomon Islands NCD program](#)

⁵⁵ [Tonga NCD national plans](#)

Tuvalu

Current FAD program

Tuvalu currently has 5 FADs with one in each of the island groups. The deeper ones are at 1,200m and shallow ones at 400m with most in shallow water. The average life span is around two years but some last longer. Inspection is undertaken annually and

there are challenges in replacing lost FADs. The target is to maintain one FAD per outer island and three in Funafuti but this has not been achieved since 2019 with only two deployed in 2022. There is some vandalism with at least two cut off deliberately and the inter-island cargo vessel has also run over and accidentally cut off FADs.

Current supporting policies

Tuvalu Fisheries Department (TFD) has a national FAD program with a management plan which is in need of finalisation. Challenges in implementation include the need for a larger and more stable vessel for deployment such as a barge fitted with a small crane that can be towed to FAD sites anywhere in the country and improved better echo location is needed for accurate bathymetric information in the selection of deployment sites.

Current costs and financial models

The ten deep water FADs deployed in 2019, cost AUD \$51,000 plus the concrete anchors and deployment costs, with the cement and sand imported to make blocks. Boat cost are AUD \$1,200/day plus diesel with materials and some deployment costs donor funded and the balance covered by government.

Other

Consultations in Tuvalu did not discuss opportunities and program overlaps for removing fishing effort from the reef areas most vulnerable to climate change and the RTP should seek early engagement with the relevant environmental programs and authorities to identify program synergies.

Tuvalu has a national strategy addressing NCDs and this includes healthy diet. Again, the RTP should seek early engagement with the health department to further identify synergies in programs and the opportunity of the FAD program to address healthy diet in vulnerable communities.⁵⁶

Vanuatu

Current FAD program

There are currently 25 FADs in the water around the country. They are deployed in 700-1200m of water and the average lifespan is two to three years with one known to be in the water for 15 years. The Vanuatu Fisheries Department (VFD) of the Ministry of Agriculture, Livestock, Forestry, Fisheries and Biosecurity undertakes monthly maintenance as well as daily routine checks by fishers who report any damage to fisheries officers. FADs are usually replaced within one month after being reported missing and vandalism hasn't been a problem in recent years and since 2021 the FAD program has included community awareness which has helped mitigation..

Current supporting policies

⁵⁶ [Tuvalu NCD program](#)

Since 2020 the National FAD Management Plan and implementation of the FAD program has been a VFD priority activity.

Current costs and financial models

FADs cost vatu-ika 450,000 plus vatu 100,000 for deployment with total cost around vatu 550,000 per FAD. Materials procurement and deployment costs are covered through VFD with government budget and some materials are also funded by projects. FADs are also deployed and owned by the game fishing club with membership fees used to cover costs.

Other

Consultations mentioned the need to have both offshore and nearshore FADs to allow access for smaller boats and less experienced fishers. Early RTP FAD program engagement is needed to ensure synergies with other environmental programs to identify priority reef areas that are most vulnerable for climate impacts. n support.

Vanuatu has a national strategy addressing NCDs and this includes a healthy diet.⁵⁷ The RTP should engage with the health department to further identify synergies in programs and the opportunity of the FAD program to address healthy diet in vulnerable communities.

⁵⁷ [Vanuatu NCD national strategy](#)

Appendix 2: Annual FAD maintenance budget

Corresponding master budget code	Annual contingency budgets	Comment	Cook Islands													
			Palau (USD)	Tuvalu (USD)	Tonga (USD)	PNG (USD)	Kiribati (USD)	Cook Islands (USD)	Samoa (USD)	Fiji (USD)	Solomons (USD)	FSM (USD)	Nauru (USD)	Niue (USD)	RMI (USD)	Vanuatu (USD)
1.3	First National staff salary and allowances	Based on year two of GCF budget	27,000	11,200	8,100	15,000	11,200	16,900	12,950	10,800	6,500	10,000	14,000	15,600	22,000	16,200
1.3	Second National staff salary and allowances	Based on year two of GCF budget	21,000	12,600		15,000	9,800			9,900		10,000				
1.3	expendable office supplies	Based on year two of GCF budget	500	350	225	240	350	195	370	360	130	800	350	195	500	540
2.1	Purchase of FAD materials including freight and container costs (plus extra buoys, shackles and swivels for maintenance per container).	Based on half of the budget of the year two of the CGF budget, may not be annual cost depending on the life-span of the FADs	45,000	45,000	45,000	90,000	90,000	45,000	45,000	90,000	90,000	45,000	45,000	45,000	45,000	90,000
2.1	equipment for FAD deployments (GPS/plotter and sounders)	Based on budget estimate by lindsay Chapman	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
2.1	Electronic monitoring equipment for fish biomass and for meteorological equipment for CC	if the data is seen useful during the pilot. Based on budget estimate by lindsay Chapman	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000
2.1	Purchase of tablets for recording catch and effort data	Based on budget estimate by lindsay Chapman	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
2.3	operationalise the FAD management plan in the local purchase of steel reinforcing rod, cement, sand and gravel for making concrete anchor blocks in the molds, including making the	implementation budget for year 4 of the estimate only, actual amount will depend on yearly number of FADs deployed. Based on year 4 of the master budget.	48,200	37,160	28,934	35,640	38,775	41,832	32,622	38,189	36,759	61,800	19,740	19,357	52,200	46,084
2.3	national workshop with SPC building local capacity in rigging and deploying FADs including undertaking site surveys of areas for FAD deployment plus sea safety, fuel, venue strengthening national data collection on FADs and their maintenance as well as catch and effort information from FAD fishing activities	Estimated to be done every two years to keep up capacity Annual budget based on 50% of the year 4 of master budget.	3,000	3,185	2,880	0	2,275	3,982	2,812	1,755	2,461	2,125	3,136	2,958	2,400	2,565
2.4	strengthening awareness raising around FADs, the FAD programme, sea safety and predicted climate change effects on the marine environment	Based on budget estimate by lindsay Chapman	10,000	10,000	10,000	20,000	20,000	10,000	10,000	20,000	20,000	10,000	10,000	10,000	10,000	20,000
2.5	at two locations per country plus FAD	depending on country needs based on Fiji	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000
	Country total annual estimate		236,100	198,495	178,139	271,680	268,800	198,889	183,554	272,004	247,428	217,725	171,216	172,140	210,100	272,419
	Without cyclone proof storage costs		191,100	153,495	133,139	226,680	223,800	153,889	138,554	227,004	202,428	172,725	126,216	127,140	165,100	227,419