

Application of the Ecosystem-Based Approach to Fisheries Management in Tuna Fisheries at the Western-Central Pacific Ocean (WCPO)

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Abstract

The issues related to tuna fisheries in the Western-Central Pacific continue to challenge decision-making among various stakeholders in the tuna industry. The Pacific Islands Forum Fisheries Agency (FFA) has adopted the ecosystem-based approach to fisheries management (EAFM) to manage tuna fisheries among its 17 member countries and territory. In 2005 the Agency started this work and includes series of meetings within its Members aiming to incorporate ecosystem related issues National Tuna Management Plans. Tuna fisheries contribute directly to small and poor economies of FFA members and the EAFM approach will help members meet their obligations towards ensuring sustainable fishing and fisheries in the WCPO. The paper explains the approach in the context of Pacific Island countries' situations and further presents insights into its intended outcome.

Keywords: ecosystem-based approach, fisheries management, sustainable fishing and fisheries

Introduction

The Western-Central Pacific region (WCPO) currently supports the largest industrial tuna fishery in the world, with an estimated annual catches averaging about 1.5 million metric tons over the past decade. Effective and sustainable management of tuna fisheries in the WCPO continues to exert many challenges among fisheries managers in this region. The nature of multi-fisheries and multi-gear of tuna fisheries coupled with the various stakeholders involved with rights and responsibilities within and outside 200 nm in tuna fisheries contributes to the complex situation surrounding effective management of tuna fisheries in this region. Given this, the 17 members and 1 territory of the FFA have adopted the Ecosystem Approach to Fisheries Management (EAFM) to help sustainably manage tuna resources within national waters, which is consistent with the relevant articles and provisions outlined in various international conventions and instruments including UNCLOS¹, FSA², UNCED³ and WCPFC⁴. The map below shows the spread of FFA Members EEZs, which have the biggest collective share of sovereign national waters across the entire WCPO.

“Ecosystem management” found formal acceptance at the Earth Summit in Rio de Janeiro in 1992 and was described as: “*a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way.*” Application of the ecosystem approach will help to reach a balance of the three main objectives of rational resource management: conservation; sustainable use; and the fair and equitable sharing of the benefits arising out of the utilisation of genetic resources. Articles 5 and 6 of the WCPFC Convention make it clear that

¹ United Nations Convention on Law of the Sea (1982)

² Fish Stock Agreement (1995)

³ United Nations Convention on Environment and Development (1992)

⁴ Western and Central Pacific Fisheries Commission Convention (2004)

ecosystem effects should play a large role in shaping management measures for fisheries in the WCPO.

Several Pacific Island countries now have formal fisheries management plans that may include policies regarding general ecosystem related issues. Few, if any, have reached the stage of actually implementing ecosystem provisions in fisheries management. However, FFA has since 2005 started in-country EAFM work to generate EAFM reports that will provide the basis for the development of operational and/or tuna management plans. These plans will incorporate the priority issues and activities identified in the EAFM report. Similarly, the SPC⁵ carries out research on tuna related issues required to support ecosystem approaches to tuna fisheries management in the WCPO. The scientific services provided for by SPC serve the interests of Member Countries and Territories as well as the WCPFC towards effective and long-term sustainable tuna management.

To assist member countries implement EAFM, the FFA have developed a Pacific Islands Forum Fishery Agency EAFM Framework (Fletcher, 2007). This framework comprises a number of stages, which lead to the eventual identification and prioritization of issues related to the current state of tuna resources, environment and social-economics. This then leads to the eventual programming of priority activities into operational framework and action plans. The process takes into account ecosystem considerations in the management of tuna fisheries. It requires substantial amounts of data on target and non-target species, interactions between target species and other species, food webs, and the direct effects of fishing on non-target species and their habitat. The most important elements of the EAFM framework are the ability to implement data collection and monitoring programs that leads to the formulation of the most appropriate management action. The biggest challenge in such a process rests on the commitment and participation of stakeholders' in-countries. In particular, having the necessary capacity and capability within Pacific Island countries to implement the operational framework and benchmark success against performance indicators.

Developing an EAFM guide is part of an initiative of the Forum Fisheries Agency to implement EAFM across the management of tuna fisheries of the western and central pacific region (WCPFC). The issues outlined in the WCPO Convention are fully consistent with implementing EAFM. Article 5 of the convention outlined what is expected for “*target species, non target species, other dependent species within the ecosystem, minimising waste and pollution, endangered species, biodiversity, optimum utilisation, the welfare of the various states involved including the interests of artisanal and subsistence fishers*”. Thus, the implementation of EAFM should be viewed as the framework that will help coordinate current activities and many of the strategies and monitoring programs already being undertaken around the region.

The paper presents the application of the FFA EAFM Framework in tuna fisheries in the WCPO, highlighting the experiences and lessons most suitable for PIC situations.

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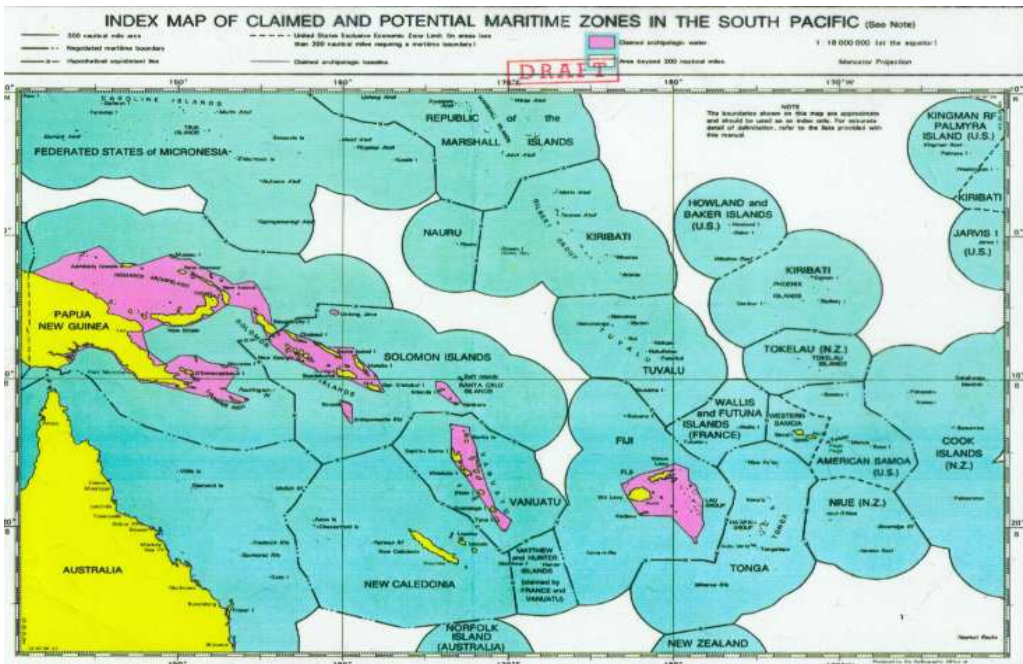


Figure 1. Map of FFA Members EEZs.

The Pacific Islands Context

In the past, well before the introduction and establishment of commercial tuna fishing in PICs, tuna was in great abundance and tuna fishing use traditional local canoes and punts in archipelagic waters. During this period, there were no issues of pollution and impact on the marine environment and ecosystem was relatively low to nil. At the same time, industrialised foreign countries dominated commercial tuna fishing in the Pacific region with little or no form of domestic tuna commercial fishing. Over recent years, this has changed dramatically with investment in the tuna fisheries of PICs having expanded and are now often taken up by domestic and local operators. Much of this success has been from the PICs claim of sovereign rights over the 200 nm sea areas and resources within it. This shift into resource ownership and direct management requires a responsible approach and the urgency to ensure resources are harvested at sustainable and optimum levels without detrimental effect to the marine ecological systems.

The response to ecosystem challenges by PICs is flagged, initially in various international, regional and national instruments where they are either party to or directly responsible for implementing tuna and ecosystem related policies. A set of standards or guidelines on ecosystem management will form part of the attempts by PICs to address emerging issues on tuna resources and its environment. The process and approach is nonetheless politically and culturally challenging and sensitive given the multi-stakeholders, multi-fisheries and multi-fishing gear nature of tuna fisheries in the Pacific region. Again, a reflection of the evolution of tuna fisheries in PICs over the years include the following transitional events: (1) changes in participation (domestic vs foreign), (2) fishing methods and gears (inefficient simple surface trolling or pole-and-line using traditional crafts and canoes vs efficient purse seine and longline fishing from high technological and modernised boats), and (3) catch volumes and values (mainly towards maximizing economic gains through fishing access, fresh and valued added products and increased domestic investment through basic infrastructures and processing facilities).

With the current relatively low catch levels of tuna fisheries in the WCPO, coupled with an increase in fishing capacity; it is crucial that effective management and policies re-alignment is undertaken to redress such trends. Among other management tools currently available to PICs, the ecosystem approach to fisheries management is one that addresses the issues holistically and with clear understanding on the interrelationships between the resource, resource users and the environment. The approach and process of pursuing this needs careful attention particularly, while ensuring long term benefits, such that it does not cause major disruptions to current tuna fishing and fisheries operations.

The EAFM is timely in the Pacific islands context given the culture of failures of many fisheries development projects in the past. A key contributing factor to such failures include corruption in governmental institutions, lack of political will and intervention, lack of capacity and high turn over in skilled personnel, dis-incentives to attract skilled people, low moral and lack of motivation, lack of clear management and development policies and shortage of capital and funding to support administration and implementing core activities.

The FFA EAFM Framework

A schematic diagram of the FFA EAFM processes detailing the four main stages of scoping, issues identification, issues prioritization and risk assessment and management system (development of operational objectives and performance values, determine/ implement actions, assess progress against performance measures, review systems) is outlined below. An example of one of the generic component trees, that are used to document all the relevant issues (biological, social and economical) for any one fishery, is also presented.

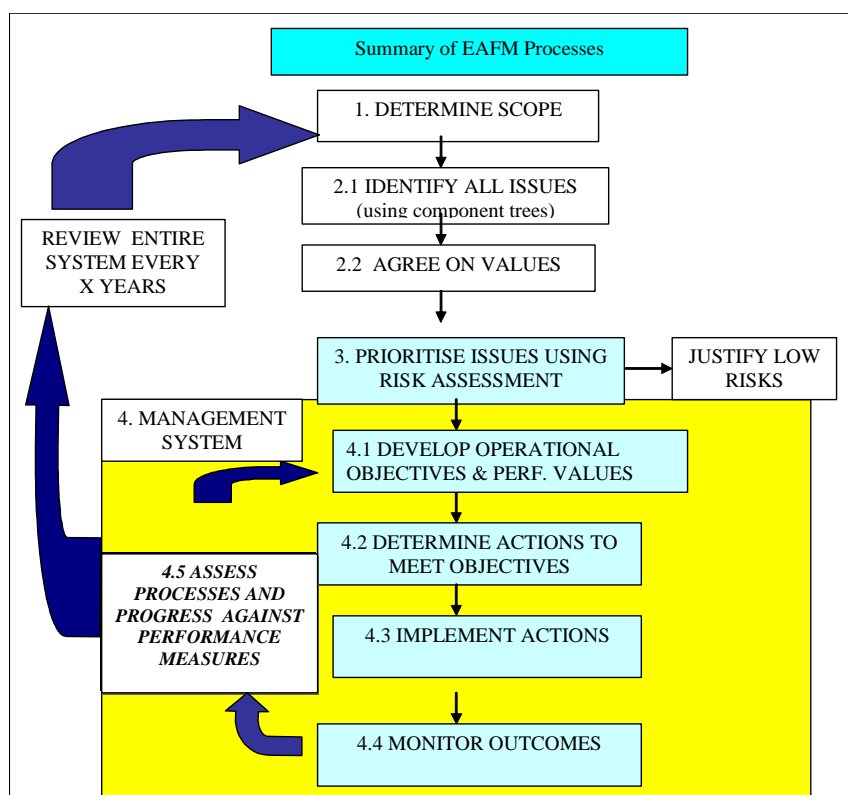


Figure 2. The FFA EAFM framework (source: Fletcher, 2007)

The above Framework outlines the four steps required to fully apply the EAFM (Fletcher, 2007):

Step 1: Determine the scope of the assessment by developing a clear description of what is to be managed/assessed. The scope of some issues may be difficult to define given that tuna fisheries deal with trans-boundary and highly migratory species and can operate at island, country and regional levels. A common distinction that is made is for those assessments that relate to the regional level (e.g. WCPO Commission), individual country level, and within country (artisanal and targeting tuna). There is a need to understand how the linkages must operate among these levels. Thus, for the target species, any management must be linked to regional level assessments.

Step 2: Having determined the scope, is the identification of all the relevant issues and what is wanted to be achieved for each issue. The outcomes wanted for an issue can vary given the requirements of any convention, country needs, local requirements and global attitudes and can be based on ecological concerns, economic realities or social attitudes. It is necessary to work out which of the issues are being used because they have different implications for what actions should be taken. For example, there is likely to be different concepts of acceptability for some elements, particular interactions with species of customary importance both among countries and regions. The use of component trees is used to categorise the issues according to broad areas of fishery (ies) under investigation.

Step 3 - The decision as to what level of management response is required is based on prioritisation of issues using risk analysis and assessment, as well as the precautionary approach. The risk analysis process determines and ensures that the current management system is working at the right level. For instance, for issues not currently addressed directly whether they continue to do nothing or, need to be doing something. Similarly, for issues that are currently being managed or investigated, the appropriate questions would include whether they are doing an appropriate amount, not doing enough or doing too much.

Step 4 – For issues that need direct management, there must be clear operational objectives and ways to assess if performance against these objectives is acceptable or not. Depending upon the issue, the management actions required may be implemented at the whole Commission level, at a country level, or just within some areas of a country. The management system must also include the monitoring and review of performance outcomes and what will happen if performance is not acceptable.

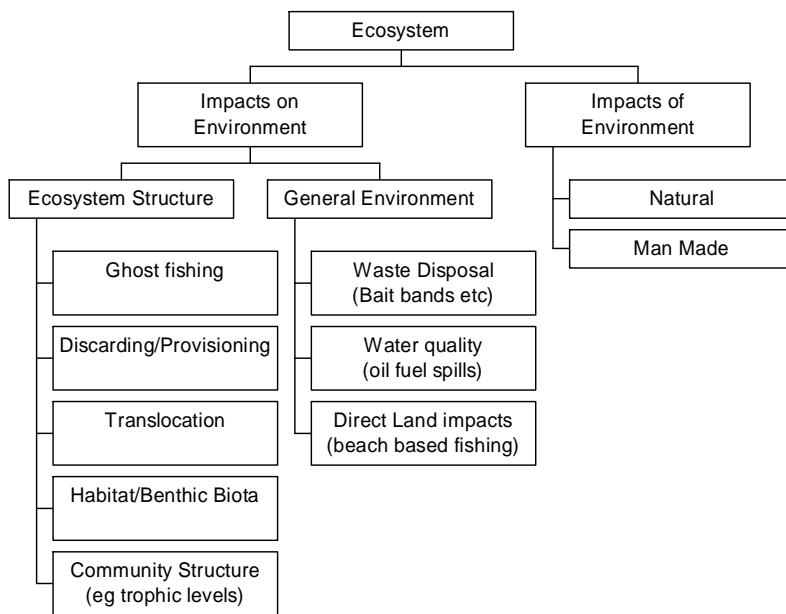


Figure 3. One of the five generic component trees (Source: Fletcher, 2007).

The EAFM Guide, the main document used in the implementation of the FFA EAFM Framework, also stresses the need to match the level of risk with the relative rate of exploitation and the types and quantities of data used to monitor performance. Where the risks (exploitation rate) are low, only crude indicators of performance are likely to be needed. Where the risks are higher and the management approach is more aggressive, leading to a relatively high exploitation rate, more robust and precise measures of abundance will be needed. A key point is that the EAFM guide by itself, does not provide the ‘answers’ – it merely assists you in the process of trying to find these.

The EAFM guide has been based on a system developed for use in Australia (Fletcher *et al.* 2004). This has been modified and tested through a series of FFA regional funded workshops. The outcomes of this workshop were a strong endorsement of the process and a number of refinements to the methodologies that should be used. The specific outputs produced at the training workshops includes a concise description of the scope of the tuna fishery within their country; a set of tailored component trees covering the issues associated with the retained species, non-retained species, ecosystem issues, generation of economic benefits, community wellbeing issues and administration issues. Four types of objectives were identified in the guide and could be used by countries/commission to assess the risk associated with any specific issues. The objectives are: (1) sustainability (i.e. keeping biomass levels above Bmsy); (2) viability (avoiding recruitment failure/ extinction for a species, thus limit is < Bmsy); (3) economic (maximise economic benefits, limit may be > Bmsy); (4) social (maximise social acceptability, limit may be >> Bmsy). The guide further highlights the long term need to have clear linkages between the objectives at the regional level and the actual management that occurs within each of the countries.

This EAFM process was adapted and implemented during in country EAFM work, recognizing the difficulties and challenges faced during the consultations with stakeholders which potentially vary from on FFA member country to the next. For example, private sector involvement in the fishing industry is a lot more in Vanuatu, Federated States of Micronesia (FSM) and Palau compared to small countries like Nauru, Kiribati and Tuvalu. This simply translates into stronger opinions on certain issues affecting the fishing industry from several stakeholders in the private sector relative to parallel views from those in fisheries authorities. The process encourages wide consultation and representation of key stakeholders to map out relevant and priority issues affecting the fishing industry. However, at

the same time ensuring the consultations remain focused on the objectives of the EAFM exercise in order to generate positive and quality outcome of deliberations. The FFA has, to date, completed EAFM scoping and stakeholder consultations in Vanuatu, Palau, Tonga, FSM and Nauru.

Application of the EAFM in the WCPO

The EAFM is a long-term undertaking for FFA member countries and territory in an effort to reduce uncertainty in the decision making process. This is particularly true for the sustainable development of the region's tuna resources in the WCPO. It is expected that this initiative should increase the long-term benefits for the communities in the Pacific region from the sustainable and optimal utilisation of these resources.

The key elements in the EAFM approach within a fisheries context, relates to the holistic assessment encompassing wide range of ecological consequences of fishing and also understanding the social and economic implications that these activities provide. For instance, the framework can cover certain part of a fishery, all the issues affected by an entire fishery, up to managing the full collection of fisheries operating in a region (which should also deal with their cumulative impacts and the allocation of access amongst the individual sectors).

The level of focus chosen in the assessment depends upon the scope of the assessment required and the jurisdiction of the agencies involved. This requires effective participation of key stakeholders engaged directly or indirectly in the tuna industry, and recognizing variation in fishing gears and methods employed and specific areas of seas commonly targeted or authorized for tuna fishing. In the FSM, the scope of the assessment was agreed to focus on the purse seine, longline and pole-and-line fisheries, which dominate and are significantly important to the country. The assessment focuses only from 12-200 nm (including FSM locally owned or flag boats fishing in the high seas and in other countries EEZs. The decision relates to the system of Federal type government in the FSM where the States governments jurisdiction extends to 12 nm. This is however not the case in other FFA countries where the scope of assessment focuses only on longline fisheries (as in the case of Vanuatu and Tonga).

In addition to enhancing the efficiency and likelihood of successful management of the tuna resources within WCPO region, the implementation of EAFM should produce a number of other benefits. Being able to demonstrate appropriate ecological performance is becoming a major driver in marketing many fisheries related products. This is occurring at both the government level leading to third party auditing schemes such as the Marine Stewardship Council system of certification. Such incentives are becoming more wide spread around the world and this is likely to get more common in the future. Given the comprehensive nature of EAFM, the challenge is to make a system that not only produces outcomes that external parties may consider more appropriate, but also a system that assists the management outcomes for all the local stakeholders in the fishery – including the fishers, managers and local communities. Thus, the drive to implement EAFM must come from within the country/community/industry or it is unlikely to succeed.

In a report commissioned by WCPFC relating to the review of ecosystem-bycatch issues in the WCPO, recommended among other things a conceptual framework for considering ecosystem issues and the variety of factors that may influence the dynamics of higher level predators (MRAG, 2002). The report also highlighted current strategies amongst FFA members and include the following countries.

The management strategies adopted under the Papua New Guinea Management Plan is the need to monitor the impact of tuna fishing on associated or dependent species and, where necessary, adopt measures to ensure sustainable management.

The Tonga Plan includes the goal of minimising any adverse impacts on tuna fishing on the marine environment and non-tuna species. The principles established in the FAO Code of Conduct for Responsible Fisheries will be used to guide the design and implementation of strategies under the Tuna Plan, including . . . promoting management measures that ensure conservation of species belonging to the same ecosystem or associated with or dependent upon the target species. Tonga requires the Master and crew to make all efforts to release all turtles, seabirds and marine mammals alive. Where possible, sharks that are not utilised for consumption or sale must also be released alive. Finning of sharks is prohibited.

In Vanuatu, the Fisheries Division monitors by-catch taken in the tuna fishery through its Observer Programme and catch reporting by all commercial fishing vessels. The Government of Vanuatu has the option to use management actions that limit or eliminate by-catch, including, but limited to, imposing closed areas, closing the fishery for certain periods, and limiting gear types. Vanuatu also prohibits the by-catch of billfish and other game species, sharks, marine mammals, turtles and birds.

The current FFA EAFM work builds on these existing management strategies and plans, however expanding it to incorporate all other relevant and prioritised ecosystem related issues within the main tuna fisheries in-countries. The consequences to the countries are inevitable given their obligations under various international instruments. This includes the enhancement in public and political awareness on wide range of issues and the possibility of negotiating for external technical and financial assistance to implement key activities generated from EAFM exercises. Most importantly is that the EAFM approach addresses the gaps in current management decisions and processes and both national and the WCPF Commission levels.

Experiences and Lessons Learnt

There was a wide range of experiences and lessons gained from the EAFM work conducted in the five FFA member countries that have had case studies completed. Among the key areas are the lack of awareness on update information on the stocks and efforts currently in place, inter-agency relationship partly due to relevant information not necessary filtering down to other stakeholders, sensitivity on issues particularly in areas of socio-economics, administration and governance and, confusion over priority issues driven either by the lack of data to support the issues or clarity of national policies and priorities on fisheries. There are, in some countries a conflict between agencies responsibilities over tuna fisheries, particularly where more than one department deals with tuna related matters. The identification of such governance issues is one of the key benefits of this EAFM approach.

Furthermore, the elements on departure of skilled staffs, re-shuffling and merging in fisheries authorities, which are often influence by change of national policies and governments, further complicate matters in effective management of tuna fisheries. In the consultations, the stakeholders often raise concerns that numerous Tuna Management Plans in the past were not fully implemented. There were little consultations and key stakeholders did not participate fully in the development process of the plans, and that the plans were not circulated widely and people lacks awareness of it. Also, there is a sense of participants protecting their interests by way of their contributions to the discussion. Some countries point to the lack of political will and government interventions, corruptions as well as the lack of financial and technical support to implement the plans.

The above experiences mounted to the difficulty in coordinating in-country EAFM consultations. However, the process encourages participants to EAFM workshops to raise those issues, which will then be assessed succinctly through the prioritization and risk assessment steps to arrive at possible management responses. In most cases, new ideas and proposals flagged during the consultations

present new opportunities for government officials in decision making positions to follow such actions through to full implementation. Similarly, the discussion also benefits stakeholders in the private sector to take on the new challenges and understanding in addressing ongoing issues with fisheries authorities as well as implementing management responses within their own fishing businesses.

In addition, the consultations and EAFM workshops further provide opportunities for improvements in the conduct and preparation of EAFM reports, Operational framework, Legal framework and Policy platform and documentation. This includes the following: keeping the EAFM report concise and short; improving the delivery of risk assessments for clarity among the participants; and encourage the use of non-technical languages during the consultations – possibly by engaging national fisheries officials. There is also the need for clear demarcation of jurisdictions between inshore and offshore fisheries, flexibility in approach, and link debate on issues to WCFC decisions, provision of workshop materials in advance and to encourage ownership of the EAFM report by local stakeholders.

Conclusion

The paper has highlighted the application of the FFA EAFM Framework in tuna fisheries in the WCPO. The experiences and lessons most suitable for PIC situations were adopted and will be used during future EAFM work in FFA countries. Several Pacific Island countries now have formal fisheries management plans that may include some policies regarding by-catch and ecosystem issues in general. Few, if any have yet reached the stage of actually implementing ecosystem provisions in fisheries management. The FFA will work with its members to ensure the management plans are completed or revised to incorporate ecosystem related issues. The operational framework will be generated from EAFM reports and FFA will provide assistance if requested, to implement specified management responses and activities.

Within the countries of the Pacific Community, there are currently Tuna Management Plans in place for Fiji, Palau, Papua New Guinea, Solomon Islands, Tonga, and Vanuatu. Most Plans generally include some over-arching goal regarding management of associated and dependent species. Taking into account ecosystem considerations in the management of fisheries requires substantial amounts of data on target species, interactions between target species and other species, food webs, and the direct effects of fishing on non-target species and their habitat. To meet the objectives of the WCPFO Convention will require substantial input into modelling and monitoring of not just target fisheries, but the environment in which they exist.

Looking ahead, the Pacific Island countries will endeavour to fully comply with their obligations under international instruments, and ready to develop and manage their tuna fisheries to maximise the opportunities for its people. The FFA will continue to provide technical services to the countries to ensure their goals and visions are fully achieved.

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