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Summary/short description/key points:

This paper outlines the key priorities of the Fisheries, Aquaculture and Marine Ecosystems (FAME) Division of SPC over the coming year. This paper was initially written prior to the substantive impacts of COVID-19. It has been reviewed and revised to reflect our understanding of the situation as of 20 April 2020. We are aware that situation will evolve further by the time of the 12th Heads of Fisheries meeting and look forward to reviewing priorities further with members at that time.

Recommendations:

Members are invited to:

- review these priorities,
- make suggestions where necessary, and
- endorse the priorities.

Introduction

1. The *Business Plan* for the Fisheries, Aquaculture and Marine Ecosystems (FAME) Division of SPC sets out the higher-level outcomes expected from the Division's work, goals, objectives and results for the period 2016–2020. FAME's overall goal is: *That the fisheries resources of the Pacific region are sustainably managed for economic growth, food security and environmental conservation.*
2. FAME's works towards this goal through six Divisional objectives:
 - Enhance data collection and provide data management services for fisheries and marine ecosystems;
 - Provide analyses and advice for evidence-based fisheries management;
 - Support the sustainable development of aquaculture;
 - Identify diverse and sustainable marine-based livelihood options for fishing communities;
 - Provide, and facilitate access to, fisheries information; and
 - Support capacity development in fisheries and aquaculture among PICTs.
3. These objectives provide the framework for the development of work plans for the main organisational units of FAME, the Coastal Fisheries Programme (CFP) and the Oceanic Fisheries Programme (OFP), supported by the Information Section and Monitoring, Evaluation and Learning (MEL) units within the FAME Director's Office.
4. In this paper, we provide an outline of the key priorities to be addressed by these units over the coming year and where appropriate in out-years. For clarity, we discuss each unit separately, but note that a number of the Divisional objectives listed above are contributed to by both CFP and OFP, while the Information and MEL units are integrated across both programmes.
5. Since the initial development of this paper, the sweeping changes resulting from the COVID-19 pandemic have had both predictable and unexpected consequences. While the marine resources of the Blue Pacific have always been key to the economies and livelihoods of SPC members, in the current world environment, fish matter more now than ever. Ensuring a sustainable revenue stream from tuna fisheries is essential as it has the potential to continue in the face of COVID-19 disruptions, unlike other important national revenue streams such as tourism. In coastal fisheries, de-urbanisation, and loss of income/jobs in tourism, and a general economic downturn are putting additional stresses on already heavily exploited coastal fisheries resources (high demand, limited supply, limited management). The aquaculture sector is also being impacted through limited access to feed and fingerlings, loss of income from export and tourism from high valued commodities such as giant clams for aquarium markets, pearls and shrimps. Communities are increasingly relying more than ever on coastal fisheries and local aquaculture particularly increasing interests in small scale low valued fish such as tilapia and milkfish for food security and livelihoods. There will be an increased interest in biosecurity and aquatic biosecurity aspects to strengthen safe movement of feed, seed and aquaculture

products. However, the COVID-19 related impacts on people movement in country, transport and travel links will remain critical operating constraints to our work programme, and in the short term we will need to be both proactive and reactive in the provision of science and information. Throughout this paper, we highlight some of the activities FAME is undertaking to help support members.

6. An emerging high priority for FAME has been to plan for a post-COVID-19 world, while still identifying, supporting and responding to immediate member needs and requests. This means assessing potential post-COVID-19 world scenarios and adapting plans as the situation evolves. To this end, maintaining essential capacity, re-training and re-purposing resources to be post-COVID-19 prepared, and preparing through planning and mobilisation to deliver essential fisheries services in that environment. What seems clear is that the importance of marine and aquaculture resources will only increase.
7. To this end, FAME has a six part approach:
 - a. conduct needs assessments and deliver on key activities (e.g. Tuna Data Workshop) to ensure monitoring and advice continues to be provided;
 - b. through work with members and other regional agencies, identify short-, medium- and long-term response needs (e.g. 'FishTell');
 - c. re-prioritise and re-plan work to meet the immediate, ongoing and post-COVID-19 Pacific needs;
 - d. identify effective approaches to deliver capacity development and support members in the face of COVID-19 related travel restrictions, including online approaches and web tools and apps to facilitate remote support for members;
 - e. look after the people and resources we have (e.g. staff morale, engagement and productivity) to ensure we continue to meet the needs of our members;
 - f. resource mobilisation to ensure the current and emerging needs of members can be met.

Key priorities and directions of the FAME Director's Office

8. The FAME Director's Office provides general oversight of the Division's work, supports regional and international cooperation and contribution on issues relating to FAME's work, develops funding and partnership opportunities and ensures that FAME is well integrated with the rest of SPC through involvement in corporate-level planning and decision making. In addition, the Office incorporates two functions that work across the Division's two substantive programmes – the Information Section, and the MEL Unit (including communications and programme planning).

Information Section

9. The Information Section supports objective 5 of the FAME Business Plan. In summary, the Section develops information and knowledge products in collaboration with all other FAME sections, as well as with, and for, all members. It also collects, organises and disseminates

relevant fisheries information, mainly to assist members achieving SDG 14: Conserve and sustainably use the oceans, seas and marine resources.

10. The priority work being conducted by the Information Section includes:

- **The production of reference newsletters and information bulletins** that provide a current look at some of the most exciting research and case studies on marine-related topics of interest to the region: the tri-annual *SPC Fisheries Newsletter* and the three yearly Information Bulletins (*Women in Fisheries*, *Beche-de-mer*, and *Traditional Marine Resource Management and Knowledge*).
- **The production of scientific and technical reports** to assist members and other FAME sections, as well as other paper-based information tools such as posters, brochures, leaflets and manuals.
- **The provision of fisheries-related information in response to specific needs** expressed by members or as a response to needs identified at the regional level, using all available media, including Internet, web applications, social media, etc.
- **The production of tailor-made information for communities**, in line with the New Song recommendations, using a wide range of materials combining print with more interactive tools, such as videos, animated films dubbed in local languages and social media.
- **The organisation of online training** aimed at reinforcing the strategic communication and information skills of Pacific Island fisheries officers, learning about and exchanging ideas on how to build and implement an efficient, culturally adequate communication plan, and how to design information tools that address fisheries management issues. This online training will be complemented by attachment training programmes as soon as the COVID-19 situation allows it.

11. In addition to the continuation of the above, possible key new directions for the Information Section include:

- **Elaborating national information strategies** in collaboration with member countries and territories to refine their communication strategies in order to enhance community engagement, elevate local voices, and support social and behaviour change efforts. The objective is to significantly increase the delivery of information on sustainable coastal fisheries management to communities. This approach will be undertaken in collaboration with the LMMA Network for the Melanesian countries.

Monitoring, Evaluation and Learning Unit

12. The FAME MEL Unit was established in 2015 and supports the FAME Division in MEL, reporting, project development and design, strategic planning, resource mobilisation and workshop facilitation. In 2019 communications and programme planning expertise were added to the team. The MEL Unit also supports and contributes to SPC-wide initiatives to improve MEL and planning across the organisation.

13. The priority work being conducted by the MEL Unit includes:
- **Internal MEL support services** are provided to improve evidence on the outcomes of FAME's work and communicating these to members and partners, along with improved tools and systems to support MEL within FAME. This includes supporting FAME to plan and adapt activities in the short-term in response to COVID-19 restrictions and issues.
 - **Regional MEL support:** The MEL Unit supports broader regional MEL activities through supporting or coordinating progress reporting on fisheries related strategies. This includes contributing to streamlining and harmonising regional reporting through:
 - a. coordinating reporting for the Future of Fisheries Roadmap / A New Song for Coastal Fisheries through the Coastal Fisheries Report Card;
 - b. MEL support for large regional projects (e.g. Pathways); and
 - c. supporting international efforts to improve fisheries related MEL (e.g. MEL for SDG14 and the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries).
 - **Communications:** As noted, in 2019 communications expertise was added to FAME. Priorities for this work include developing and implementing a communication strategy for the Division, improved communication and visibility of FAME's results and achievements, increased communications capacity among FAME staff, and strengthened relationships with stakeholders, partners and donors. In light of COVID-19, this work also includes cohesive messaging on the impact of COVID-19 on fisheries and aquaculture in our region.
 - **Pacific Fisheries Leadership Programme (PFLP):** Programme management for the PFLP moved into the FAME MEL Unit in 2020. See section below on Capacity Development.
14. In addition to continuing the above priorities, one COVID-19 initiative which has been commenced during the lockdown period is the development of a Fisheries Intelligence network which we have called FishTell. This is FAME using our informal and formal networks to provide essential intelligence on fisheries and aquaculture in the region. We intend to continue to shape this initiative and share information from it with members and donors as appropriate.

Key priorities and directions of the Coastal Fisheries Programme

15. The Coastal Fisheries Programme supports all six of the FAME Business Plan objectives. In summary, the CFP provides science and technical support to PICTs to enhance the management of coastal fisheries, and the sustainable development of aquaculture and nearshore livelihoods across the region.
16. The CFP assists governments and administrations to develop scientifically informed and socially achievable coastal fisheries management policies and systems (national and community-based). It provides a regional framework for sustainable aquaculture, including planning, research and development, aquatic biosecurity and trade, for Pacific Island governments, the private sector and other stakeholders. It assists in developing sustainable nearshore fisheries in Pacific Island countries and territories to provide food security, sustainable livelihoods, promote economic growth, assist with climate change adaptation, and now through assisting members to face the rapidly emerging and evolving challenges to coastal fisheries and aquaculture by the COVID-19 responses in the region.

17. The CFP is working to adapt our planning and implementation to better respond to the changing circumstances in the region resulting from the effects of COVID-19 in the short-, medium- and longer-terms. We have reached out through both informal and formal networks (e.g. “FishTell”) to identify the current and emerging challenges facing both coastal fisheries and aquaculture in the region. The COVID-19 related travel restrictions and other national actions to isolate members from the impacts of the coronavirus have resulted in significant economic and social impacts which in turn are increasing the dependence on coastal fisheries resources and aquaculture for food security and livelihoods. To support members CFP is working to shift our core scientific and technical support by further developing online and video-based training modules, technical web/tablet modules and apps for data collection, and direct technical and management advice and mentoring by videoconferencing. CFP will continue to review, modify and re-evaluate our support to members to more effectively provide targeted and relevant support.
18. The CFP works in partnership with other SPC Divisions (Social Development Programme; Regional Rights Resource Team; Land Resources; Climate Change and Environmental Sustainability Programme (including PROTEGE); Statistics for Development; and Geoscience, Energy and Maritime), and collaborates with a wide range of universities, international, regional and local NGOs, and other CROP agencies (SPREP; FFA) to deliver the CFP work programme.
19. The CFP work priorities are guided by national requests (including assisting with emergency responses to disasters, such as cyclones/typhoons and the COVID-19 impacts) and the frameworks and strategies in the “New Song for Coastal Fisheries – Pathways to Change” and the coastal fisheries component of the “Future of Fisheries: Regional Roadmap for Sustainable Pacific Fisheries”. These involve a focus on: **Empowerment** – developing policies and legislation that provide for the involvement of coastal communities in the management of their fisheries resources; supported by national controls on export commodities, communities will drive local management regimes with clear user rights. **Resilience** – implementing strategies to manage the various threats to coastal ecosystems. **Livelihoods** – adopting policies to develop alternative livelihoods for coastal communities that are impacted by declining fisheries resources (aquaculture, water-based tourism and small-scale fishing for tuna provide options, but many solutions will lie outside the fisheries sector). Key to this is the involvement of women, youth and disadvantaged groups in decision making and access to the benefits – **gender and human rights-based approaches** are being mainstreamed into all CFP work programme activities.
20. In 2019, the HoF11 initiated a two-year trial of annual HoF meetings, and the regional fisheries ministers formally established a one-day Regional Fisheries Ministers Meeting (RFMM) to be held immediately after the FFC Ministerial. The RFMM will provide an opportunity for Ministers to consider strategic issues in coastal fisheries and aquaculture, as well as high-level consideration of cross-cutting issues affecting fisheries such as climate change, marine pollution, ocean acidification, sustainable livelihoods and food security. These changes have resulted in a new, but still evolving, coastal fisheries and aquaculture regional strategic direction setting framework, information flow and decision-making process with the RTMCF (November) reporting to the HoF (March), which can now report to the RFMM (June/July) and on to the Forum Leaders (August/September). With the COVID-19 related travel restrictions in the region, this year FAME is adapting the new regional strategic direction setting framework by including the RTMCF outcomes as a session in the online/virtual HoF12 meeting.

21. The engagement and role of non-state actors (CSOs; NGOs; private sector) in the coastal fisheries and aquaculture regional strategic direction setting framework is still evolving. HoF11 requested SPC to review the Terms of Reference for the Coastal Fisheries Working Group (CFWG) and the Special RFMM (2019) "...recommended to SPC that the CFWG be disbanded and that other options be considered for giving effect to the Leaders' decision in 2016 in relation to coastal fisheries (para 10, 47th Leaders Communique)." A review of the CFWG and options and recommendations for increasing the engagement of non-state actors in Pacific Islands regional coastal fisheries strategic direction setting has been undertaken and the results will be provided to HoF12 for consideration.
22. Organisationally, the work of the Coastal Fisheries Programme falls under two sections: Aquaculture; and Coastal Fisheries Science, Management and Livelihoods. These sections are supported by two cross-cutting areas: Coastal Information and Data – providing database and information service support and advice; and Fisheries Economics – providing economic advice, analysis and assessments of fisheries and aquaculture data and projects. The provision of coastal fisheries and aquaculture economic support and advice in 2020 has been restricted by the difficulty in recruiting a suitable fisheries economist.
23. The key priorities and directions of each of the above work areas are summarised in the following sections.

Coastal Information and Data

24. The priority work being conducted by the Coastal Information and Data team includes a concerted effort and collaboration with the CFSML and aquaculture sections to develop the online/web tools and apps to facilitate remote support for members:
 - **Small-scale fisheries catch data collection through the use of photos and tablet applications** (TAILS & IkaSavea) was conducted in 2019 to trial the methodology and will be rolled out in several countries in 2020. Further development is underway to facilitate the synchronisation of data between offline and online tools, and to provide access to outputs and results to participating members.
 - **A web/tablet module has been developed for invertebrate catch data** to deal with the specificities of the invertebrate fisheries (seasonality and fishing habits; specific types of measurements) and will be trialled in 2020. It will be complemented by an online module for underwater surveys.
 - **To promote the accessibility of scientific knowledge** to national fisheries staff, country specific fisheries and aquaculture related documents have been scanned and several knowledge bases established in country (to cope with possible copyright and confidentiality issues). This effort will continue in 2020 and the coming years.
 - **Current knowledge of the biology, exports and regulations of targeted species** is being collated by experts and will be presented in an online database that is in development, along with tools derived from these parameters (such as, weight and length conversions between wet and processed product; suggested minimum size derived from species traits).

- In order to **improve the mapping and monitoring of the benthic habitat** in relation to coastal resources, large photographic underwater surveys have been conducted to complement classification from satellite imagery. Trials are underway to process these pictures using machine learning for computer assisted image classification.
 - A **Monitoring, Control, Surveillance and Enforcement (MCS&E) online module to record infringements** has been rolled out and is currently being trialled in one country. With the increase in coastal fisheries activities in the region due to COVID-19 related restrictions, the further development and expansion of the trials are a high priority.
 - **Online training (data acquisition, entry and analysis) tools and access to the latest information** will be developed on a fishery-by-fishery basis, to provide web-based self-service tools for the various stakeholders.
25. In addition to the continuation of the above, possible key new directions for the Coastal Information and Data team include:
- As more catch and survey data becomes available, and due to the current COVID-19 situation, the emphasis will be put on the **development of web modules for quality control, predefined queries and statistical analysis** to ease data flow between members and SPC, as well as the assessment and cleaning of data and accessibility to scientific outputs (self-service and expert advice).
 - **Tools and methodologies in relation to traceability** of commercial products will be explored to improve the monitoring of levels of exploitation and allow enforcement of coastal fisheries-related quotas at a local scale.

Aquaculture

26. The priority work being conducted by the Aquaculture Section includes:
- **Enhance regional and national capacity in aquaculture policy and planning** to establish clear priorities for aquaculture meeting current and future needs, including the emerging COVID-19 related aquaculture needs. Key programmes in support of this work are:
 - a. Provide expertise to provide technical support to members on the development of new and review of existing national aquaculture development and management plans.
 - b. Provide technical support to member countries on the development and/or review of commodity specific policy and action plans.
 - c. Provide technical support to members in the area of aquaculture and aquatic biosecurity legislation.
 - d. Providing technical support to members on the implementation of sub-regional and regional roadmap on aquaculture and aquatic biosecurity.
 - **Providing direct and remote technical and analytical support for aquaculture** to facilitate production and economic sustainability. Key programmes in support of this work are:

- a. Strengthen technical and capacity limitations in the countries to address key aquaculture constraints in the area of feed, seed and broodstock management, including further developing the 'cluster approach' as a means to support small operators better manage coronavirus impacts on aquaculture.
 - b. Provide technical support to member countries and territories to improve aquaculture infrastructure, especially to meet national responsibilities in brood stock management, to provide bio-secure facilities for quarantine, and to support fledgling private sector with aquaculture inputs (seed, feed).
 - c. Build capacity of aquaculture staff and practitioners, including training exchanges.
 - d. Private sector development and up-scaling of production from research phase to commercial phase.
 - e. Improve networking and collaboration, technology, research, skills transfer and technical advice.
 - f. Strengthen business skills, knowledge and information of aquaculture operation through business mentoring and training.
 - g. Strengthen economic and market assessments for viable aquaculture commodities and products.
- **Enhance the management of aquatic biosecurity risks:** As the Pacific does not have a tradition of local species domestication for aquaculture, suitable species have to be introduced. To protect the biodiversity of the region, there is a strong need for responsible practices, and regional capacity in biosecurity is very limited. Key programmes in support of this work are:
 - a. Support members to assess their aquatic biosecurity needs and practices as impacted by the COVID-19 related travel and isolation restrictions.
 - b. Support members to improve aquatic biosecurity practices on relevant disease diagnosis, surveillance and reporting.
 - c. Strengthen national capacities on risk analysis in aquaculture.
 - d. Strengthen national capacities of quarantine of live aquatic organisms.
 - e. Support countries to improve national infrastructure and operations for quarantine of live aquatic organisms.
27. In addition to the continuation of the above, possible key new directions for Aquaculture include:
- **Support good governance** in terms of policies, legislations, development and management plans through increasing online tools, training and support. Absence of good governance is said to slow development in aquaculture.
 - **Expand current cluster approach** to include supporting industry associations so they can reach a critical mass through better information exchange.
 - **Strengthen gender and social inclusion assessments** to better understand family farming including roles of women and youth in aquaculture

- Provide support to member countries in **web-based data applications** to strengthen on-farm data collection and management.
- **Improve engagement in aquaculture in the area of monitoring, control and surveillance** as well as carrying out capacity building in occupational health and safety in aquaculture farming operation.
- **Strengthen leadership skills in commercial aquaculture farming operations.**
- **Target future work to support hatcheries for key commodities** and low cost/low tech farming systems for livelihood aquaculture through cluster/association approach for valuable commodities.

Coastal Fisheries Science, Management and Livelihoods

28. The priority work being conducted by the CFSML section includes:

- **Assisting and working with member countries to assess and manage finfish and invertebrate resources and their associated habitats** to inform management through resource assessments, data analysis, interpretation, training, mentoring and advice.
- **Assisting countries in strengthening coastal fisheries and aquaculture management arrangements**, through support in reviewing and drafting policies, management plans, legislation and regulation and training national fisheries officers and communities in Monitoring, Control, Surveillance and Enforcement activities.
- **Increase support in community-based marine resources management**, in particular by reviewing and revising the Community-based Ecosystem Approach to Fisheries Management Guidelines through lessons-learned in the implementation of CBFM/CEAFM in the region; facilitating cross-site CBFM exchanges between communities in different PICTs; provide on-going support for reviewing and advising on CBFM programmes and projects based on member requests; and providing oversight of the implementation of the PEUMP Programme LMMA Network CBFM activities in Melanesia.
- **Support member countries in sustainable livelihoods opportunities**, through strengthening national FAD programmes, capacity enhancement in safe, sustainable fishing methods and support, and develop non-extractive use of coastal fisheries resources.

29. In addition to the continuation of the above, possible key new directions for CFSML include:

- **Build the Sustainable Livelihoods Unit**, including more integrated development projects (both internally and externally), and **roll out of proven alternative and supplementary livelihood opportunities**, such as promoting fishing for near-shore pelagic, increased support for eco-tourism and fish preservation, postharvest and value adding, and sea safety.
- **Work towards expanding the capacity and scope of work of the Science Unit** to better meet the increasing requests from members for coastal fisheries science advice, guidance, training on data collection, analysis reporting and application to management, and how many species may be affected by climate change. The **intent is to build-up coastal fisheries and aquaculture**

science from a 'unit' to a 'section' to meet an increasing demand and need, with climate change science more effectively integrated.

Key priorities and directions of the Oceanic Fisheries Programme

30. The OFP supports objectives 1, 2, 5 and 6 of the FAME Business Plan. To summarise, OFP provides scientific advice on the status of stocks and impacts of fisheries and the environment on both target and non-target species and the pelagic ecosystem, conducts research on the biology and ecology of these stocks, provides technical support in the collection and management of data from the fisheries, and provides capacity building opportunities to members across these fields of work.
31. OFP delivers its work to members both at the national level and through the various regional and sub-regional fisheries organisations of which they are members, including the Western and Central Pacific Fisheries Commission (WCPFC), the Pacific Islands Forum Fisheries Agency (FFA) and the Parties to the Nauru Agreement (PNA). In doing so, there is extensive collaboration with the Secretariats of these organisations, as well as with many NGOs, universities and government fishery agencies.
32. Providing scientific advice to help maintain healthy oceanic resources and ecosystems continues to be a key OFP role, to ensure that both short-term and long-term options are informed by the best available scientific information. Following the COVID-19 outbreak, OFP has reached out to its' partners and worked collaboratively to identify emerging issues and deliver scientific advice to improve understanding and help develop effective mitigation strategies. In addition to being responsive to addressing emerging COVID-19 issues, OFP also continues to pursue work that will support sustainable management of tuna fisheries to help ensure longer-term benefits can be maintained. In turn, progressing work that will contribute to a better understanding of food security options, such as estimation of potential bycatch levels, further research into non-target species biology and data reporting tools (e.g. TAILS), can help provide scientific information to support decision making that may mitigate some COVID-19 impacts.
33. Organisationally, the work of the Programme falls into three sections – the Fisheries & Ecosystems Monitoring & Assessment (FEMA) section, the Data Management (DM) section and the Stock Assessment & Modelling (SAM) section – however, there is considerable integration across these areas in order to provide comprehensive services and support in oceanic fisheries to members.
34. The key priorities and directions of each of the above work areas are summarised in the following sections. These provide some highlights of the work of each OFP Section, particularly for the priority work, since space is not available to cover the breadth of activities being undertaken.

Fisheries & Ecosystem Monitoring & Analysis

35. The priority work being conducted by the FEMA section includes:

- **Providing important biological inputs** for stock assessments and related scientific advice. This includes work on tuna age and growth, reproduction, movements, diet and trophic ecology. Key programmes in support of this work are:
 - a. The Pacific Tuna Tagging Programme, with annual tag release cruises and the regional tag recovery effort now funded substantially by WCPFC;
 - b. Trophic ecology research voyages and associated laboratory analyses; and
 - c. PIRFO, the Pacific Islands Regional Fisheries Observer programme, coordinated collaboratively with FFA to provide training and accreditation of tuna fisheries observers in the region.

These programmes are undertaken with substantial collaboration and assistance from member fisheries offices, in particular national observer programmes. In addition to providing critical data for stock assessments, modelling the impacts of environmental variation and other management advice, they also provide opportunities for member fisheries scientists to enhance their capacity and skills through direct participation in this work.

- **Modelling the impacts of environment variation, including climate change**, on tuna and the pelagic ecosystem. OFP pioneered the development of the SEAPODYM model, a key platform for understanding the interaction of environment and tuna, in the late 1990s, and we continue to collaborate with the French organisation Collecte Localisation Satellites (CLS) in moving this work forward. SEAPODYM integrates a variety of fisheries, biological and environmental data at a fine spatial scale, and it can be used to assess questions such as the efficacy of spatial management measures and the impact of environmental variation such as ENSO and climate change.
- **Monitoring the impacts of tuna fisheries on bycatch** and the pelagic ecosystem more broadly. FEMA conducts analyses of observer data to produce estimates of important bycatch species, including species of special interest such as marine turtles and sea birds, and are reported periodically as regional- and national-level analyses. This information is increasingly important for the certification of fisheries by bodies such as the Marine Stewardship Council.
- **The application of new technology** to monitoring of fisheries. FEMA provides assistance to members in the development and implementation of video-based electronic monitoring tools for monitoring catch and effort by longliners, as well as rolling out electronic reporting tools, such as the longline e-log *OnBoard*, port sampling app *OnShore* and the *Tails* app for collecting small-scale fisheries data, all developed by the OFP Data Management Section.
- **Maintaining the Pacific Community Specimen Tissue Bank** that includes samples collected for the WCPFC Tissue Bank. It supports existing science programmes that support tuna stock assessments and biological material for developing new directions in tuna trophic ecology, methyl mercury, micro/nano-plastics and building the region's capacity in marine ecosystem science generally. Increasingly, the facility combines coastal and oceanic science and provide

significant new opportunities for member fisheries scientists to enhance their capacity and skills through direct participation

36. In addition to the continuation of the above, possible key new directions for FEMA include:

- **Fisheries genomics to better understand mixing of tuna stocks.** Evidence is beginning to emerge that tuna stock structure may be significantly more complex than the hitherto assumed single, panmictic stocks across the western and central Pacific. Fisheries genomics through the understanding of who is related to who through kinship analyses provides a significant tool to estimate the level of structuring in stocks and their connectivity. Addressing these questions will reduce uncertainty in stock assessment and management. FEMA is commencing this work through a design study to determine the sampling and analytical needs.
- **Investigating wahoo and mahi mahi ecology,** as key species of importance to nearshore fisheries and critical to the success of the nearshore anchored FAD fisheries in the coming decades. Currently, there is limited information on their biology and ecology in the Western and Central Pacific. Age and growth, migratory patterns, and how these species may be impacted by climate change are key questions. This work would need to occur across OFP and CFP.
- **Investigating the impact of methyl mercury and micro/nano-plastic** contamination of tuna and other fish stocks, including the health implications for Pacific Island human populations. There is a long-held concern in some quarters that high levels of fish consumption may carry risks of methyl mercury poisoning. However, there is also evidence that such risks vary according to fish species, size/age and area. There may also be mitigating factors and positive health benefits from elements/compounds such as selenium and omega-3 fatty acids that are also found in these fish. Micro and nano-plastic contamination of fish and the oceans generally is emerging as a new and serious threat for fisheries and human health. There is a need to better document the risks posed by these contaminants against the health benefits of a high-seafood diet, particularly given the high fish consumption levels in many Pacific islands, as well as policies aimed at increasing access to tuna and other pelagic species to enhance food security. FEMA will begin an investigation of the prevalence of organic pollutants in the muscle and of microplastics and plastic additives in the stomachs and muscle of tuna and other top order pelagic predators in the Western and Central Pacific Ocean in June 2020.

Data Management

37. The priority work being conducted by the DM section includes:

- **Enhancements and support for TUFMAN 2 and DORADO,** which enable member countries to manage/report on their integrated tuna fishery data. These systems now integrate all major tuna-fishery data types (including logbook, VMS, observer, port sampling, and unloadings data) and work will continue to focus on how to enhance capacity so that member countries have more control on processing, managing, reporting and analysing their data, through these systems. SPC will also continue its focus on using the *Slack* helpdesk to provide live support to members, noting that this system now has over 320 users, who have exchanged more than 420,000 messages since inception in 2016.

- **Enhancing E-Reporting (ER) tools** developed by SPC in response to member country requests. The Data Management section has developed several E-reporting tools in response to member country requests: the longline e-log *OnBoard* and the *TAILS* app for collecting small-scale fisheries data are now well-established systems and implemented in several member countries. The port sampling app *OnShore* is increasingly being used by member countries and presents considerable potential for the future of port monitoring. All E-Reporting systems developed by SPC are fully integrated into the *TUFMAN 2* and *DORADO* systems.
 - **Data Management support to the WCPFC**, which also covers the direct support to member countries in satisfying their WCPFC reporting obligations, but also building capacity (through mechanisms such as the Regional Tuna Data Workshop) to enhance the ability of member countries to respond directly to WCPFC reporting obligations without SPC assistance.
 - **Acquisition of E-Reporting and E-Monitoring data from third-party systems**, covers situations where member countries choose to adopt ER and EM systems developed and maintained by third-party technical service providers. SPC continues to work with member countries and their service providers, providing advice on data quality control and other standards so that the data flow seamlessly into regional systems (e.g. the member country's *TUFMAN 2* database instance). SPC has a key technical role in the establishment of ER and EM standards in the region, which have continued to progress in the past year with the agreement of a regional EM Policy and draft regional longline EM minimum data fields.
 - **Data standards for regional tuna fisheries** continue to be enhanced and now extend beyond the requirements for science to include the requirements for Monitoring, Control and Surveillance (MCS), Economics and E-Monitoring process standards. SPC continues to have a key role in coordinating meetings that review and update documentation on regional data standards (with other regional and sub-regional organisations, and member countries).
38. In addition to the continuation of the above, possible key new directions for DM include:
- **Support for new management systems required by member countries**, for example, Catch Documentation Systems (CDS) and Catch Management Systems (CMS). Most data already collected and managed through the *TUFMAN 2* and other national/regional systems, are fundamental input into proposed regional and national CDS and CMS systems. SPC will continue to have a key role in the provision of technical advice and support to the sub-regional agencies (e.g. FFA and PNA) overseeing these initiatives and to the individual members in the future.
 - **New E-Reporting (ER) tools** developed by SPC in response to member country requests. For example, SPC has completed the development of an ER system to acquire longline observer data at sea, in response to requests from several member countries. This longline observer ER tool (called *OLLO*) is now ready for trials and will complement the other ER tools developed by SPC and feed observer data seamlessly into the *TUFMAN 2*, which will then be immediately accessible from the *DORADO* system. SPC remains attentive to future requests from member countries for new ER tools.
 - **Dashboard and mobile-app reporting including alerts**, is an area with considerable potential for tuna fishery data in the future. For example, senior managers could potentially have an app that, with one or two screen touches, show graphs of year-to-date, cumulative monthly catches within their EEZ, or for their national fleet. These graphs could also include estimates

of catches using VMS data (covering logsheets not yet available) and projections to the end of the year, based on past patterns of catches for those latter months. Alerts are features of business intelligence systems (the ‘push’ philosophy, rather than the ‘pull’ philosophy of reporting systems) and there is significant scope to introduce this concept into the systems supported by SPC, for example, alerts to highlight particular data gaps and alerts when approaching certain catch levels.

- **Independent validation of at-sea longline transshipments** has been identified as a major data gap and SPC has initiated work in this area through a collaborative fact-finding study in collaboration with FFA in late 2019. SPC will continue to advance this collaborative work and have a key role in the provision of technical advice in establishing an adequate, independent data collection system for at-sea longline transshipments, in collaboration with other sub-regional and regional agencies and interested members.

Stock Assessment & Modelling

39. The priority work being conducted by the SAM section includes:

- **Regional stock assessments of tuna, billfish and sharks** to inform scientific advice on current stock sustainability and fishery health within the western and central Pacific Ocean. These assessments will continue to provide the basis of analyses examining the potential effectiveness of candidate regional management approaches to achieve fishery objectives of profitability and sustainability. The results also feed into the Future of Fisheries Report Card for offshore fisheries.
- **Harvest strategy work** for key tuna stocks and fisheries. Following adoption of the harvest strategy approach by WCPFC members, the SAM section is developing the modelling and simulation framework to undertake this work. They will be working with members to identify candidate harvest strategies, including harvest control rules, that best meet their objectives for the fishery in the face of uncertainties in our knowledge and information. A key focus for the coming year is the delivery of national harvest strategy workshops to enhance understanding of the concepts and process for national stakeholders.
- **National-level advice** based upon scientific analyses to address specific national requests and issues. These activities include the development of new ‘Issue-Specific National Reports’ to address emerging issues of national importance, and on-going bio-economic evaluations of national fisheries undertaken in partnership with FFA. The analyses are supported by the frequently updated secure online national webpage for each member. Remaining responsive to national requests remains a critical component of the SAM section’s activities.
- **FAD tracking and acoustics** to support stock assessments and increase our understanding of this fishing approach. The increasing number of FADs being deployed in the WCPO has raised concerns for tuna stocks, as well as vulnerable species and ecosystems. Work assisting the PNA FAD tracking programme will continue, in order to understand the potential impacts of this fishing gear. The expanding use of acoustic buoys on FADs provides a new source of information, and the SAM section will continue to work with key partners to examine the potential to use these data to address current data gaps and provide new sources of information to support stock assessments.

40. In addition to the continuation of the above, possible key new directions for SAM include:
- **National FAD data collection** to increase national understanding and support decision-making on FAD related issues. SAM Section will continue to support national initiatives to encourage public-led data gathering on FAD beaching events, and to curate the resulting information. This approach will increase the information available on beaching events and ground-truth the outputs of analyses.
 - **Novel use of Purse Seine CPUE data** to inform stock assessments. Pole and line fishery data, used to inform the assessment of skipjack abundance trends, is declining in both quantity and spatial scale. While data from purse seine fisheries are more abundant, they are not commonly used to inform tuna assessments in this way due to the schooling nature of the fish caught by this gear, and the rapid technological developments in the fleet (potential ‘effort creep’) which are difficult to correct for. However, the SAM section is continuing a specific body of work to try to address these issues and develop an alternative source of information from the purse seine fishery. This will also consider the development of the FAD fishery and its technology (see above), to attempt to better evaluate the level of effort creep within the fishery. The work will involve research by a new Pacific Island Fishery Professional.

Capacity development

41. Capacity development is defined by UNDP as the process through which individuals, organisations and societies obtain, strengthen and maintain the capabilities to set and achieve their own development objectives over time. It is an intrinsic part of FAME’s programme delivery, as evident in the FAME Business Plan 2016-2020. Objective seven of the Business Plan specifically deals with supporting capacity development in the fisheries and aquaculture among PICTs.
42. Capacity development is a key focal area of the FAME Division that cuts across our entire work programme. It is delivered in several ways – as a by-product of our day-to-day interactions with members in the conduct of our work and mentoring, through regular, focused workshops in a particular subject area (e.g. the Tuna Data Workshop; small-scale fisheries operations), accredited training, and through workplace based training and short-term attachments at SPC headquarters to receive intensive training in a particular area of our work.
43. Travel and isolation restrictions imposed due to COVID-19 presents particular challenges for the way FAME delivers capacity development activities. To date, activities have adapted to online delivery in various formats such as video conferencing and recorded webinars. FAME will continue to rethink and adapt how it delivers capacity development activities during this period. In a post-COVID-19 world, recorded webinars in particular will also provide opportunities to reinforce workshop-based capacity development activities once attendees return to their home base.
44. **Experiential workplace-based attachments and trainings:**
- a. Pacific Islands Fisheries Professional (PIFP) Programme: The Pacific Islands Professional Programme offers 12-month positions within FAME to nationals and residents of the Pacific Island countries and territories (PICTs) who are currently employed in roles related to

fisheries. The Programme's key objective is to build personal and professional capacity in the region. Since its inception in 2013, 14 Pacific Islanders from 9 countries and territories have completed the programme with SPC. The PIFP programme was pioneered by CFP several years ago and expanded to the OFP in 2017.

The programme was evaluated in 2018. Following this review, it was decided to continue the PIFP programme as a centrepiece of the Division's capacity building effort. Currently, five new PIFPs are employed and currently in post: in OFP from the Cook Islands, Fiji, and FSM; and, in CFP from the Cook Islands and Vanuatu. PIFPs are competitively recruited through regular SPC recruitment procedures. A condition of the appointment is that PIFPs must be given leave-without-pay by their employer, usually a Government fisheries office, for the duration of their one-year appointment at SPC and be guaranteed a job on their return to their home country.

At SPC, PIFPs work in one or more sections within FAME, and are expected to make a hands-on contribution to the work of the section as well as developing skills that will be of long-term benefit to them and their employer when they return to work as a fisheries professional in their home country. We are hopeful that FAME will be able to continue to host up to five PIFPs per year over the next few years.

- b. Short-term attachments to SPC: FAME sections bring in their counterparts from member countries on a short assignments usually of one to weeks to work on specific tasks or to undergo intensive training alongside staff at SPC (for example – Aquaculture team bringing in colleagues from NFA PNG and Fisheries Ministry in Fiji to develop the Aquatic Biosecurity Policy).
- c. In a related development, the Aquaculture internship posts available at the model tilapia farm in Suva, Fiji have been expanded from one position to two from early 2020. The interns spend six months working with the FAME aquaculture team and are together responsible for running the model tilapia farm. In 2020 this includes an aquaponics extension. The individuals participating in this capacity development are in high demand for employment on completion and most have gone on to full time work in the aquaculture industry. We are hopeful that FAME will be able to continue to host two aquaculture interns over the next few years.

45. Formal trainings:

- a. Accredited Pacific Islands Regional Fisheries Observer Fisheries Programme (PIRFO). The PIRFO programme is implemented jointly by Forum Fisheries Agency and SPC. PIRFO is structured to provide a vertical career progression for skilled observers to become further trained as debriefers, trainers, assessors and observer programme frontline managers.
- b. Accredited Certificate IV in Coastal Fisheries & Aquaculture Compliance: Part of the MFAT-funded Effective Coastal Fisheries Management project, this certification course is designed to improve food security and livelihoods through skilled staff and communities managing and enforcing robust policies and legislation for sustainable coastal fisheries and aquaculture in the Pacific. A component (Output 5) of the project involves partnering with

the University of South Pacific to deliver accredited training to Pacific Islanders in Coastal Fisheries and Aquaculture compliance. The project will run from 2016 to 2021.

- c. Pacific Islands Fisheries Leadership Programme (PFLP): The PFLP is an MFAT-funded programme implemented by consortium members (SPC – lead agency, FFA, People Focus, University of Queensland and the Centre for Leadership and Adaptation (CLA) with the long term objective of improved quality and diversity of leadership and management in priority sectoral areas and increased cooperation between relevant participants and their institutions.

46. **Non-accredited workshops and mentoring:**

- a. FAME undertakes annual capacity development workshops such as the Stock Assessment Workshops (SAW) and the Tuna Data workshop (TDW). These workshops will continue and are refined annually to improve and add content as necessary. Importantly, this year SAWs will include additional material on harvest strategies and management strategy evaluation. We are also encouraging WPEA countries to support attendance of a limited number of participants.
- b. Along with annual workshops, there are also one-off or periodic workshops that are implemented across the division on key topic areas such as harvest strategies, aquatic biosecurity, fisheries policy, and safety at sea, etc. While these trainings are not accredited, they are delivered as structured workshops with key learning objectives identified and often included some form of competency testing or output.