FORUM FISHERIES COMMITTEE

ONE HUNDRED AND EIGTHEENTH MEETING

25 - 28 May 2021

FFA

Agenda Item:	***8***
Paper Number:	***FFC118-WP05***
Title:	Impact of Climate Change on Oceanic Fisheries

Summary:
The impacts of climate change on distribution and abundance of tuna stocks are predicted to be significant. It is crucial for FFA to prepare accordingly.

FFC Ministers, in recognising the Leaders' direction that climate change is the single greatest threat to the region agreed to the following key areas for FFA:

i. adaptive fisheries management regimes that can respond to the potential changes in stock levels and their distribution and mitigate the potential impact of these on fishing patterns and the level of economic benefits Members derive from fisheries;
ii. incorporation of climate change mitigation and adaptation into domestic fisheries legislation and management plans;
iii. the delimitation of maritime boundaries;
iv. the significant role that tuna fisheries plays in supplementing local food security needs;
v. greater CROP and Partner collaboration on climate change;
vi. note the ongoing efforts by the Secretariat towards 'greening' the FFA Headquarters and properties.

This paper updates Members on how the Secretariat has progressed some of this work, noting that it is ongoing and is integrated into the work programme.

Recommendations:
FFA Members are invited to:

i. **note** the work to support a transition to adaptive fisheries management regimes, including the development of harvest strategies through the MSE process for the key tuna stocks and the agreement of cooperative zone based management arrangements**.** Members to reaffirm commitment to these processes and engage in good faith on these priority work areas.;
ii. **consider** the proposed strategy to assert the FFA position on maritime boundaries in the event of sea level rise and that an assertive and clear statement by FFC Ministers be developed;
iii. **note** the ongoing work to ensure increased contribution of tuna to food security;
iv. **note** the proposed analysis on how potential changes in tuna stock levels and their distribution may impact at the fishery and national levels, including on the economic benefits Members obtain from their tuna fisheries.
v. **note** the information collected on the FFA Vessel Register in relation to use of refrigerant gases by fishing vessels.
vi. **note** the ongoing collaboration with partners and enhanced engagement in the One CROP Plus Mechanism for climate change.

Introduction:

1. At FFCMIN16, Ministers underlined the Leader's directive that climate change is the single greatest threat to the region and received presentations on the projected impacts of climate change on offshore fisheries and well as the work of CROP bodies and partners to respond to climate change. In this respect, Ministers called for closer CROP collaboration that responds to the specific needs of the region and that firmly places fisheries issues onto the wider climate change agenda, including in the context of the Pacific's engagement in the UNFCCC.

2. Ministers strongly supported key work areas identified for responding to climate change impacts on offshore fisheries including: work on adaptive management regimes; the securing of baselines and associated maritime boundaries in the face of sea-level rise; and the importance of ensuring tuna stocks are managed at levels that continue to contribute to the food security of Pacific Island communities given the predicted declines in coastal fisheries resources.

3. Ministers also called on CROP bodies and partners to continue to coordinate their respective work in this area and report to Ministers on this work. Furthermore, Ministers supported the call for integrated policy dialogue within national jurisdictions to ensure climate change planning incorporates all sectoral impacts on fisheries.

4. Additionally, at the FFC116 Officials meeting, Members requested the Secretariat to develop a strategic approach in the context of climate change that supports the development of coordinated strategies to mitigate social and economic impacts on FFA Members arising from the projected movement of fish stocks eastwards into high seas areas.

5. This paper provides an update on activities undertaken by the Secretariat to advance the implementation of FFC and FFCMIN decisions. Furthermore, this paper proposes recommendations that will continue to advance this work.

Key Issues:
Adaptive Management Regimes

6. FFA's Strategic Plan 2020-2025 highlights the importance of understanding and managing the impacts of Climate Change on offshore fisheries. Specifically, FFC will "[r]eview and as necessary amend regional management regimes to ensure that they are sufficiently adaptive to expected changes resulting from climate change". National and subregional discussions and positions will inform this review.

7. The Strategic Plan sets out the role of the Secretariat which is to:

- Work with SPC to interpret and advise FFA members on the management implications of scientific advice on the predicted impacts of climate change on Pacific tuna
- Estimate the social and economic impacts of predicted changes to tuna abundance and distribution
- Assist FFA Members to develop adaptive management regimes (at national, subregional and regional levels) to ensure that fisheries management can be responsive and robust in the context of climate change.

8. Most of the appropriate approaches and tools for adapting management to address climate change impacts are already in place or under development with the support and engagement of Members, e.g. effective harvest strategies that are robust to ecosystem change and operate over longer temporal scales than current practice. Adapting management to climate change may rely

on an improved understanding of species and ecosystems that will likely be most affected by climate change and Members are encouraged to support better collection of data from the fisheries to underpin future management arrangements, modelling efforts and monitoring of stocks

9. The importance of establishing effective rights-based management frameworks based on agreed zone-based limits cannot be overstated. Without these frameworks in place Members risk losing the primary mechanism through which they might respond to future changes to the spatial and temporal distributions and abundance of fish stocks in ways that are economically beneficial to them. The PNA Vessel Day Scheme is an example of one such mechanism which can be adapted in response to climate change impacts on stocks. Continued delays in agreeing management arrangements for other fisheries may pose a threat to the ability of Members to respond to future climate-induced changes in the distributions of those fisheries.

10. The above tasks will require dedicated effort and resources, specific time for Members to discuss and develop management options at national, subregional and regional level. The FFA Secretariat, in collaboration with Partners, has commenced work in supporting Members in understanding the impacts and determining how best to adapt and welcomes requests for such support from all Members.

11. Adaptive management is a foundation of climate resilient fisheries and recognises that in the face of a changing environment there is no perfect management strategy and therefore many candidate management options must be considered through a process of management strategy evaluation (MSE) Considerable work has been undertaken by SPC on the management strategy evaluations supporting the move to harvest strategy based management of the tuna fisheries. A series of capacity building workshops by SPC with the support of the FFA Secretariat to improve Members' understanding of this MSE process continues.

12. SPC also continue to improve our understanding of the possible impact of climate change on the distribution and abundance of the region's four main tuna stocks. This work is ongoing and is currently undergoing refinement to examine EEZ scale changes as well as impacts at the stock level. Projections for EEZ scale analyses are expected to be completed in 2023 under current resourcing arrangements. SPC is also undertaking analyses to estimate how quickly the western and central Pacific is changing due to climate impacts and the cost-effective approaches to how this change can be easily monitored.

Domestic Fisheries Legislation, policies and plans

13. The incorporation of climate change considerations in domestic fisheries legislation, policies and plans allows for adaptive management of the fisheries resources. Fisheries legislation may provide various provisions relating to climate change. Principles and considerations for decision making can require that the effects of climate change upon the marine living resources be addressed through appropriate adaptation and mitigation measures. Legislation may also allow for the introduction of climate change adaptive species for aquaculture purposes. The Secretariat will work with Members in the review and strengthening of domestic fisheries legislation to promote inclusion of climate change considerations.

Maritime Boundaries

14. The importance for FFA Members to ensure that they determine or formalise their maritime boundaries has been reiterated, in particular by the Forum Leaders. At their 2019 Pacific Islands Forum,

"24. **Leaders noted with concern the threat posed by sea level rise to securing the Blue Pacific, and reaffirmed their commitment to conclude negotiations on all outstanding maritime boundaries claims and zones**.

25. Leaders discussed progress made by Members to conclude negotiations on maritime boundary claims since the Leaders meeting in Nauru 2018, and **encouraged Members to conclude all outstanding maritime boundaries claims and zones.** Additionally, Leaders reaffirmed the importance of preserving Members' existing rights stemming from maritime zones, in the face of sea level rise, noting the existing and ongoing regional mechanisms to support maritime boundaries delimitation.

26. **Leaders committed to a collective effort, including to develop international law, with the aim of ensuring that once a Forum Member's maritime zones are delineated in accordance with the 1982 UN Convention on the Law of the Sea, that the Members maritime zones could not be challenged or reduced as a result of sea-level rise and climate change."**

15. Forum Leaders at their 2021 Retreat, endorsed the Pacific Islands Forum Leaders Ocean Statement 2020/21 which provides for:

"16. Securing the limits of the Blue Pacific Continent against the threats of sea-level rise and climate change is the defining issue underpinning the full realisation of the Blue Pacific Continent. We are committed to concluding outstanding maritime boundaries claims and zones, including related treaties and legal frameworks to support the sustainable development and ensure the peace and security of our Blue Pacific Continent not only from environment threats but also from external geo-strategic interests. **We are also committed to a collective effort, including to develop international law, with that aim of ensuring that once a Forum Member's maritime zones are delineated in accordance with the 1982 UN Convention on the Law of the Sea, the Member's maritime zones cannot be challenged or reduced as a result of sea-level rise and climate change**."

16. From a fisheries perspective, the delimitation of maritime boundaries is fundamental for compliance and management purposes, in particular the work on adaptive management regimes and ensuring that zone-based rights are not undermined by the effects of climate change.

17. FFA continues to collaborate with SPC's Geoscience Energy and Minerals Division (SPC-GEM) and others to ensure that stakeholders are working from a common dataset. The network of assistance has had great success, with only 13 boundaries remaining to be settled. Concerned Members are strongly encouraged to continue their work to delimit these remaining boundaries. FFA has funds to provide assistance in areas including turning the technical solutions from SPC-GEM into legal and policy proposals, negotiations, drafting treaties and submissions to the UN.

18. Specifically on the status of boundaries in the event of sea level rise, FFA Members have consistently stated that the best protection is to have their boundaries delimited, legislated, publicly declared and submitted to the UN, in accordance with the requirements of the UN Law of the Sea Convention.

19. The Secretariat continues to work within the regional framework coordinated by the Pacific Islands Forum towards the realisation of the Leaders' commitments. Over the past year, collaboration has included the following activities:

(a) Preparation of papers and presentations for the Regional Conference on Securing the Limits of the Blue Pacific: Legal Options and Institutional Responses to the Impacts of Sea Level Rise on Maritime Zones, in the Context of International Law;
(b) Participation in the above Regional Conference;
(c) Participation in the Informal Working Group of the Forum Specialist Sub-committee on Sea Level Rise in relation to International Law;
(d) Contributions towards the elements of a draft regional normative declaration on sea-level rise and maritime zones;
(e) Contribution on the elements of aide memoire to accompany the regional normative declaration;
(f) Review of the Zero Draft of the regional normative declaration on sea-level rise and maritime zones;
(g) Contribution towards the regional submission to the International Law Commission' First Issues Paper.

20. In concert with the Leaders' commitments in 2019 and 2020/21 "to a collective effort, including to develop international law…" the Committee may wish to consider an assertive and clear statement from FFC Ministers on this subject.

Food Security

21. FFA Members recognise the significant role that tuna fisheries play in supplementing local food security needs, especially with the increased pressure on coastal fisheries. This is captured in the FFA Strategic Plan 2020-2025 which places an increased emphasis on social benefits associated with tuna fisheries.

22. Recent and planned work is aimed at understanding the current contribution of tuna fisheries to food security and investigating potential initiatives to increase this, noting that this will also include policy changes that might be necessary to achieve this given the potential impacts of climate change. Should the projected eastward movement of tuna stocks occur then this will potentially adversely affect the ability of countries located in the west to increase the supply of tuna to local markets.

Analysing economic impacts

23. While this work and its outputs are very useful Members are also, naturally, interested in how potential changes in stock levels will impact at the fishery level (for example, through potential changes in fishing patterns) and at the national level through, for example, impacts on access fee revenues. While estimates have been made of the potential impact of climate change on catch and access fee revenues these estimates are based on highly simplistic assumptions in relation to changes in biomass and are rudimentary at best with a more robust approach being required. To this end the FFA Secretariat has begun to explore the use of econometric analysis to allow this as summarised in the next section.

Current econometric work on climate change at FFA

24. There are a number of possible measures of climate change: SST (sea- surface temperature anomalies are one measure), biodiversity measures, would be another indicator of climate change. The ENSO is cyclic in nature and not really a measure of climate change although interactions between the ENSO and SST are clearly possible. Using the ENSO as a proxy for climate change only takes one so far. Stock movements are influenced by both effects.

25. In terms of examining impacts on license and access fee revenues a panel data set for 15 countries with 11 years of license fee data has been compiled. Analysis examining the impact of

SST anomalies for the Pacific as measured by the Oceanic Nino Index (ONI) on license fees controlling for factors such as the ENSO, fishing effort, prices and other relevant data is currently being undertaken.

26. A possible impact of climate change in the region concerns impacts on the distribution of stocks and consequently of effort. The Secretariat has begun, and will continue, to investigate the use of various modelling approaches to allow for such potential impacts to be investigated. The FFA Secretariat is also considering employing other approaches to address the impact of climate change within the framework of bio-economic models to allow us to better explain how climate change may impact fishery and national outcomes including fisher behaviour and license fee revenues. One of the options under consideration is to formally couple the current work of SPC within the framework of a bio-economic modelling approach. FFA and SPC are currently exploring options to resource this approach.

Ozone-Depleting Substances

27. Annex VI Regulation 12 of MARPOL 73/78, which entered into force on 19 May 2005 stipulates the following guidelines for flag States, vessel owners and shipbuilders for complying with the Montreal Protocol:

    - Ozone Depleting Substances (ODS) and equipment containing ODS shall be delivered to appropriate reception facilities when removed from a ship
    - Installations with ODS other than HCFC-22s, are banned on all ships built on or after 19 May 2005
    - Installations with HCFC-22s are prohibited on ships built on or after 01 January 2020
    - Ships covered by Annex VI Regulation 12 of MARPOL have to maintain a list of ODS-containing equipment; a ship with rechargeable systems containing ODS has to maintain an ODS Record Book on board.

28. Some preliminary work was undertaken, commencing in 2013 and concluding in 2015, which assessed refrigeration facilities in FFA members and the extent of the use of HCFC-22 as a refrigerant. Estimates of the use of HCFC-22 in tuna fishing vessels flagged to FFA members was also made which indicated that the total HCFC-22 holding capacity on the FFA member-flagged vessels was found to be several times more than the combined HCFC-22 baselines for Pacific countries as set by the Montreal Protocol.

29. As at 18 March 2021 a total of 1013 vessels of all types were in good standing on the FFA Regional Register. As part of the Registration process vessels are required to complete a data field specifying what type of refrigerant is used by the vessel. The purpose of this data field is so that the extent of the use of ozone depleting refrigerants in the tuna fishery can be determined. Coverage of this data field has improved in 2021 with only 115 vessels failing to supply refrigerant details or providing insufficient information to determine the type of refrigerant used. This compares with 465 vessels in 2020, noting that in each year 31 of these vessels were bunker vessels which do have refrigerated storage facilities.

30. The use of ozone depleting refrigerants varies greatly across the major vessel types, with longline and carrier vessels the highest user of these refrigerants. A total of 527 longline vessels (93% of all longline vessels) are using ozone depleting refrigerants. Similarly, 110 Carrier vessels or 82% of all carrier vessels use ozone depleting refrigerants. By contrast 38 purse seine vessels, or only 15% of all purse seine vessels are using ozone depleting refrigerants.

31. Many of the vessels using ozone depleting refrigerants are older vessels built before 2000 so as these vessels are scrapped or removed from the fishery in some other way they will be replaced by vessels with more modern refrigerating systems.

Ongoing CROP Collaboration to highlight importance of fisheries at COP26

32. The Secretariat has actively engaged with the OneCROP Plus Mechanism for Climate Change. This mechanism has been adopted by CROP Executives to support the Pacific SIDS to effectively prepare for and participate in the UNFCCC processes. While this mechanism has been operational for several years, FFA has commenced active engagement to ensure that fisheries issues are included as an issue for the Pacific SIDS to raise in the global arena. The One CROP Plus Team is under the lead coordination of SPREP, and the current membership consists of FFA, PIFS, SPC, SPREP and USP, as well as PIDF, UNDP and UNEP.

33. Additionally, the Director General continues to work closely with the CEOs of PIFS, SPC and SPREP in engaging with the high level processes leading up to the UNCOP26. On 1 September 2020, the Director General participated in the High Level Roundtable with the COP Presidency's Rt Honorable Lord Goldsmith, Minister of State for the Pacific and the Environment, United Kingdom. This high level roundtable set the foundation for greater recognition and significance of fisheries issues in the management of sustainable marine environments and the importance this plays in the wider climate change agenda.

34. Members may wish to note that there are many mechanisms, processes and engagement activities in the lead up to COP26, the Secretariat shall continue to participate and actively engage in these, as well as work with Members, in order to firmly place fisheries issues onto the wider climate change agenda, including in the context of the Pacific's engagement in the UNFCCC.

'Greening' the Secretariat

35. In the Secretariat's effort to reduce its carbon footprint, the Secretariat has undertaken to reduce its reliance on fossil fuel electrification and is exploring the use of a solar system to meet the needs of the Secretariat. In order to fully or partially operate off solar power, it is essential to work with the national authorities for the approval of the use of solar systems, the Secretariat is currently awaiting engagement with Solomon Power.

36. Additionally, the Secretariat is working with our property experts, who are undertaking a property management review to consider the "greening of our properties including use of solar". Early efforts have included the commissioning of standalone solar lighting for outside lighting purposes at the Secretariat as well as FFA houses.