

Report on Development of the Pacific Regional Aquaculture Strategy

Results of sub-regional and regional consultation workshops

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(October 2024)



Olsen Pacific Consulting (October, 2024)

Contents

Summary.....	i
1. Introduction and background.....	1
1.1. Development of the <i>Pacific Regional Aquaculture Strategy</i> through sub-regional consultation workshops	1
1.2. Objectives.....	2
2. Sub-Regional Workshops.....	2
2.1. Format, and agenda of workshops	3
2.2. Session questions.....	3
2.2.1. Day 1, Session 1: General aquaculture and aquaculture technologies.....	3
2.2.2. Day 2, Session 1: Aquatic Biosecurity.....	4
2.2.3. Day 2, Session 2: Aquaculture legislation.....	5
2.2.4. Day 3, Session 1: Aquaculture economics.....	6
2.2.5. Day 4, Session 1: Environment/climate change resilience and cross-cutting issues	7
2.3. Potential priority activities.....	8
3. Pacific Regional Aquaculture Strategy Consultation Workshop.....	10
3.1. Format, and agenda of workshop.....	10
3.2. Ranking and endorsement of regional priorities for the PRAS.....	10
3.2.1. Top 15 ranked priority activities.....	16
3.3. Aquatic biosecurity in the PRAS in relation to the PRFAB	17
4. Discussion and conclusions	18
4.1. Regional priority action themes for the strategy.....	18
5. References	20
6. Appendices	21
6.1. Abbreviations and country codes	21
6.2. List of invested regional workshop PICT participants	22
6.3. Consolidated Sub-Regional Workshop break-out group discussions	24
6.4. Examples of aquaculture success stories in PICTs	25

SUMMARY

In 2022 the Pacific Community (SPC) commissioned a study (the [Regional Aquaculture Assessment](#)) to investigate ways of promoting sustainable aquaculture development. A key recommendation of this study was that a regional aquaculture strategy should be developed. A *Pacific Regional Aquaculture Strategy* (PRAS) would assist in building capacity within Pacific Island Countries and Territories (PICTs); with the aim of harmonising aquaculture development and investment plans across the region, enhancing cooperation between PICTs for key services, and facilitating access to export markets. The PRAS is not intended to replace national plans or strategies, instead it would provide agreement and guidance at the regional level to support implementation of aquaculture goals.

The PRAS consultation process was undertaken through a series of four virtual workshops coordinated by SPC in collaboration with an external consultant (Olsen Pacific Consulting). The three sub-regional consultation workshops (Melanesia, Micronesia and Polynesia) aimed to:

- (a) Provide a forum for free and open discussion on regional approaches for aquaculture development across a wide range of stakeholders.
- (b) Document sub-regional objectives, priorities, ideas, and success stories.
- (c) Promote active collaboration and coordination amongst stakeholders.

Outcomes from the sub-regional consultation workshops were then presented at a *Pacific Regional Aquaculture Strategy Consultation Workshop* (6-8th August 2024) with the aim to:

- (a) Discuss and review findings from the sub-regional PRAS workshops
- (b) Agree on regional priorities for inclusion in the PRAS.

The sub-regional workshops and the *Pacific Regional Aquaculture Strategy Consultation Workshop* helped identify regional priority activities for inclusion in the strategy, which were then ranked using an objective scoring system that considered all priorities identified by each country. The highest ranked priority activities were then grouped into common themes for inclusion in the PRAS.

The PRAS priorities and themes and were presented to the PICT representatives at the final day of the *Pacific Regional Aquaculture Strategy Consultation Workshop* where they received endorsement from the group. These themes were then used to form the basis of the PRAS and a summary of these is included below.

Regional priority action themes for the PRAS.

Sustainable aquaculture technology.

1. Develop new production species including “native/endemic/indigenous species”, and promotion of low-trophic species.
2. Foster technical capacity building in aquaculture through regional training programmes for aquaculture to increase skills and adoption of innovative and modern techniques.
3. Develop a regional feed supply chain, feed mill(s), and a feed research facility to develop and distribute feeds for commonly farmed fish species
4. Develop hatcheries to supply seedstock for grow-out and support development of in-country satellite hatcheries.
5. Develop culture system models and guidelines for multi-trophic aquaculture and integrated agri-aquaculture.

Aquatic Biosecurity

1. Develop a regional diagnostic laboratory network to support disease diagnoses, research and surveillance.
2. Capacity building in aquatic biosecurity through the development of a regional technical training programme.

3. Continue to develop biosecurity standard operating procedures and processes.
4. Investigate common disease and pest introduction pathways, including risks associated with ballast water and biofouling.

Legislation and regulation

1. Support mapping of coastal and maritime domain for potential areas suitable for aquaculture, including identification of ownership, legal security/tenure, and use (e.g. community, cultural, conservation and tourism).
2. Support updating existing aquaculture legislation or new aquaculture legislation by promoting greater understanding and consistency of legislation across the region.
3. Develop regional templates for development of specific areas of legislation and regulation supporting aquaculture development.

Economic development, livelihoods and food security

1. Investigate sources of finance and funding opportunities for aquaculture development by both commercial-scale and small-farmer (community) operations, which may include developing necessary resources and skills for attracting funds (such as business plans).
2. Develop post-harvest and value-adding processing practices to improve food safety and product quality, including regional Quality Assurance Programmes and Hazard Analysis Critical Control Point training programmes.
3. Foster closer collaboration between international organisations, including Council of Regional Organisations of the Pacific (CROP) agencies, on aquaculture issues.

Social inclusion

1. Foster integration of aquaculture in community-based fisheries development to promote gender equity, disability and social inclusion, and a people centred approach to development.

Environmental and climate change resilience

1. Develop and promote disaster resilient aquaculture through improved areas such as aquaculture infrastructure and improved farm location planning.
2. Investigate techniques that have potential to provide resilience to climate change impacts (e.g. increased water temperature, increased acidification) for aquaculture, such as through species selection, culture techniques, location, and farm design.

It envisaged that the PRAS would be a strategy for the entire aquaculture sector (governments and administrations, private sector, communities, development partners, etc.), and as such could include issues that fall outside of SPC's technical and policy advisory mandates. Although SPC would promote any endorsed strategy, financing and promotion of the activities required must be a joint effort between all stakeholders and beneficiaries. If supported, the PRAS has potential to assist in building capacity within PICTs; with the aim of harmonising aquaculture development and investment plans across the region, enhancing cooperation between PICTs for key services, and facilitating access to export markets.

1. INTRODUCTION AND BACKGROUND

1.1. Development of the *Pacific Regional Aquaculture Strategy* through sub-regional consultation workshops

A vibrant and sustainable aquaculture sector has potential to contribute to employment, food security, health, environmental protection, and a viable economy throughout the Pacific Island Region. However, growth of this sector in the Pacific region has occurred more slowly than predicted. Consequently, in 2022 the Pacific Community (SPC) commissioned a study (the Regional Aquaculture Assessment) to investigate ways of promoting sustainable aquaculture development ([Integrated Aquatic Solutions \(IAS\) 2022](#)).

A key recommendation of this study was the development of a regional aquaculture strategy. In response to this recommendation a series of sub-regional and regional workshops were undertaken to enable consultation with stakeholders on the content and direction of the *Pacific Regional Aquaculture Strategy* (PRAS).

It is anticipated that a PRAS would assist in building capacity within Pacific Island countries and territories (PICTs) and the private sector; with the aim of harmonising aquaculture development and investment plans across the region, enhancing cooperation between PICTs for key services, and facilitating access to export markets. Representatives attending the 13th Heads of Fisheries Meeting supported the development of a new regional aquaculture strategy (Heads of Fisheries 13 Decision 13c) and endorsed a consultation process involving three virtual sub-regional workshops and a regional workshop to ensure that development of the PRAS was inclusive and fully endorsed by members.

The PRAS consultation process was undertaken through a series of virtual workshops coordinated by SPC in collaboration with an external consultant (Olsen Pacific Consulting). The three sub-regional consultation workshops (Melanesia, Micronesia and Polynesia) were designed to address each of the nine key objectives raised by the Regional Aquaculture Assessment along with an additional objective focusing on policy, legislation, and planning.

These objectives were:

- Objective 1: To raise the profile of aquaculture and promote how it can be used to assist economic and social development agendas of Pacific Island countries and territories.
- Objective 2: To identify how aquaculture production of edible and non-edible aquatic products can improve income and food security in the commercial, community and small holder subsectors.
- Objective 3: To identify gaps in capacity and improve knowledge and skills throughout the aquaculture sector.
- Objective 4: To ensure that biosecurity measures keep pace with aquaculture development.
- Objective 5: To assess the resilience of aquaculture to climate change and other natural disasters in the region and develop outline plans for mitigating measures.
- Objective 6: To assess and improve market access and supply chains.
- Objective 7: To assess and enhance quality of post-harvest product.
- Objective 8: Where agreed by PICT members, establish regional cooperative institutional frameworks.
- Objective 9: To include cross cutting issues such as health, environment and gender in aquaculture development discussions.
- Objective 10: Identify where gaps occur in policy, legislation, and planning, and assess how these may be addressed.

By using a consultative approach to identifying priority areas and progressing these through a range of agreed and achievable actions, the PRAS can assist in unlocking the Pacific region's aquaculture potential through agreed strategic approaches, harmonisation of development and enhanced cooperation.

It envisaged that the PRAS would be a strategy for the entire aquaculture sector (governments and administrations, private sector, communities, development partners, etc.), and as such could include issues that fall outside of SPC's technical and policy advisory mandates. Although SPC would promote any endorsed strategy, financing and promotion of the activities required must be a joint effort between all stakeholders and beneficiaries.

The PRAS supports aquaculture development in a harmonious and cooperative manner by providing agreed actions that can be achieved in a realistic timeframe. It encompasses the entire aquaculture sector (governments, private sector, communities, development partners, etc.) and is not intended to replace national plans or strategies, instead it would provide agreement, guidance, and support for implementing aquaculture goals at the regional level. However, the PRAS could also be used by PICTs in the following manner.

- As a regional planning and assessment tool to identify and guide aquaculture status, gaps, and priorities.
- To identify potential for cooperation or collective action at regional or sub-regional levels.
- To provide strategic guidance to governments, partners, donors, and organisations on where assistance can best be delivered.
- To provide a framework for evaluating progress in scaling up of aquaculture across the region.

1.2. Objectives

The objectives of the sub-regional workshops were to:

- (a) Provide a forum for free and open discussion on regional approaches to aquaculture development across a wide range of stakeholders.
- (b) Document sub-regional objectives, priorities, ideas, and success stories.
- (c) Promote active collaboration and coordination amongst stakeholders in the Pacific region.

Outcomes from the sub-regional consultation workshops were presented at a *Pacific Regional Aquaculture Strategy Consultation Workshop* (6-8th August 2024) with the aim to:

- (a) discuss and review findings from the sub-regional workshops
- (b) agree to regional priorities for inclusion in the PRAS.

2. SUB-REGIONAL WORKSHOPS

There were three virtual sub-regional workshops:

- Polynesian (9-12 April 2024)
- Micronesia (13-17 May 2024)
- Melanesia (24-28 June 2024)

Since the workshops were conducted virtually, SPC–Division of Fisheries Aquaculture and Marine Ecosystems (FAME) encouraged members to have a range of participants present in the room. Representatives from relevant non-government organisations, farming industries, stakeholder and community groups involved in aquaculture throughout the Pacific region were also invited to attend the workshops. A list of regional workshop participants is provided in *Appendices (6.2. List of regional workshop participants)*.

More than 80 nominations from 18 countries were proposed, and between 23-30 participants, attended each sub-regional workshop, with most (81%) being government representatives.

The workshops, which used the on-line *Zoom* platform (<http://www.zoom.com>), were conducted in English and with French translation provided for the Polynesia and Melanesia workshops.

The following background documents were provided to workshop participants for review prior to the workshop:

- *Assessment of the Aquaculture needs, priorities and future direction in the Pacific Islands Region presented at the 5th SPC Regional Technical Meeting on Coastal Fisheries and Aquaculture (11-14 October 2022)* (Integrated Aquatic Solutions 2022).
- *Outcomes of the 6th SPC Regional Technical Meeting on Coastal Fisheries and Aquaculture, including an Update on progress of the Pacific regional aquaculture strategy* (SPC FAME Secretariat 2023).
- *Pacific Regional Framework on Aquatic Biosecurity* (SPC FAME 2020).
- SPC Policy Brief #45: Legal frameworks for aquatic biosecurity (SPC FAME 2024)

2.1. Format, and agenda of workshops

The Melanesia and Micronesia workshops were conducted over five morning sessions, each lasting three hours, however, due to the challenges of varying time-zones, the Polynesia workshop had to be conducted over four days. Each daily session represented a core theme while the final day was allocated to additional discussion on outstanding matters and regional aquaculture priorities for the PRAS. The daily sessions were:

- | | | |
|---------------|------------|--|
| Day 1, | Session 1: | General Aquaculture and aquaculture technologies |
| Day 2, | Session 1: | Aquatic biosecurity |
| | Session 2: | Aquaculture legislation |
| Day 3, | Session 1: | Aquaculture economics |
| Day 4, | Session 1: | Environment/climate change resilience and cross-cutting issues |
| Day 5, | Session 1: | Additional discussion topics and further discussion of regional aquaculture priorities |

For each session there was an introductory presentation outlining the session theme followed by facilitated break-out group discussions. The Polynesia workshop followed a similar format, with session adjusted to fit within four days.

During break-out group discussions participants were guided through a series of themed session questions (outlined below) aimed to prompt dialogue. Based on feedback from the initial workshop (Polynesia) discussion questions were refined and consequently there were some minor differences in the latter two workshops for Micronesia and Melanesia. The consolidated results of break-out group discussions from each Sub-Regional Workshop are provided in *Appendices (6.3. Consolidated Sub-Regional Workshop break-out group discussions)*.

During the workshops, participants were also asked to provide examples of aquaculture success stories in their country. These are provided in *Appendices (6.4. Examples of aquaculture success stories in PICTs)*.

2.2. Session questions

2.2.1. Day 1, Session 1: General aquaculture and aquaculture technologies

This session aligned with *'Objective 1: To raise the profile of aquaculture and promote how it can be used to assist economic and social development agendas of Pacific Island Countries and Territories'* within the Regional Aquaculture Assessment. It aimed to identify specific 'game-changers' that could help promote aquaculture. The term game-changers referred to initiatives that could be used for either the promotion of Pacific regional advantages or the development of techniques that could assist in lowering production costs, improve growth, increase access to markets, or improve sustainability.

Regional advantages could include examples such as the unique growing conditions of the Pacific aquaculture that allow the production of a disease and chemical free product, for example promotion of new markets using Pacific branding. Whilst examples of production innovation could include improvement to growing techniques and processing of current products, the farming of new species, or development of

new products. Other game changers could be to address the major issues that currently inhibit aquaculture growth such as supply of feed, seed-stock, or specialist expertise.

Discussions also included any perceived negative impacts that the participants may have towards aquaculture development and where participants perceived the optimum balance between development and environmental protection should be. Most importantly, participants were asked to consider how a regional plan might assist in achieving these game-changers for aquaculture development.

Group questions

1. Where would you like aquaculture in your PICT to be in 5-10 years' time.
 - a. Do you think that you will achieve this?
 - b. Why do you think this?
2. What major issues, innovations, or game-changers should PICTs focus upon now to achieve their (5-10 year) aquaculture goals?
3. Please discuss how a regional approach could assist in resolving these this? Which of the 'game-changers' should be included in the regional strategy?
4. Do you have any other comments

Questions presented during the Polynesia workshop only^a

5. Should Governments be attracting more privately owned enterprises to invest in commercial aquaculture?
 - a. If yes, what should they be doing to attract investment?
 - b. If no, why not?
 - c. How can a regional plan assist in this process
6. Does your PICT have any national strategies or plans for increasing the level of aquaculture production?
7. What to you consider are the greatest challenges for aquaculture development in your PICT?
8. What can be done to strengthen priority areas in terms of capacity building? How could a regional approach assist in resolving these?
9. Are there any knowledge and skills that your PICT would want to concentrate and build on to improve and build/produce expertise?

a: Following review of the first workshop (Polynesia), it was concluded that some of that some of the questions were repetitive in nature and it was recommended that these be refined for workshop 2 (Micronesia) and workshop 3 (Melanesia).

Additional optional questions

10. Do you see value in developing regional cooperation for collective action in aquaculture? If yes, what are your priority areas and how do you envisage this happening in practice?
11. Would your PICT support the development of regional centres of excellence? Examples might include hatcheries supplying stock to the region, feed production, aquatic disease diagnostic services, and product marketing.
12. Does your PICT have any facilities that could be considered a regional centre of excellence, or easily developed into one? Please describe the facility.

2.2.2. Day 2, Session 1: Aquatic Biosecurity

This session aligned with '*Objective 4: To ensure that biosecurity measures keep pace with aquaculture development*' of the Regional Aquaculture. Objective 4 was one of the larger discussion topics because it included a review of the existing *Pacific Regional Framework on Aquatic Biosecurity* (PRFAB) and how that document related to biosecurity issues within the PRAS.

The Pacific region has many comparative advantages regarding fisheries and aquaculture but is at the same time vulnerable to biological threats. Therefore, potential introduction pathways, such as imported broodstock and feed, must be appropriately managed. Pests and diseases, once introduced, can move

between island groups and eventually spread throughout the Pacific Island region, therefore a regional approach to aquatic biosecurity is preferential.

The PRAS and PRFAB have different purposes when it comes to aquatic biosecurity, the PRFAB being a guide for developing national capacity, whilst the PRAS addresses regional issues that cannot easily be addressed by individual countries. Workshop participants were asked to consider whether aquatic biosecurity should be included within the PRAS or whether it was adequately addressed by the PRFAB. Participants were invited to comment on the benefits or deficiencies of the PRFAB and, where possible, provide examples of aquatic biosecurity needs. As part of discussions, consideration was given to whether objectives of the PRFAB were being addressed and if any modification to the workplan needed to be undertaken and what regional aquatic biosecurity issues could be best addressed by the PRAS.

Group questions

1. Are you familiar with the PRFAB?
 - a. If yes, under what circumstances would you refer to it?
 - b. If no, did you look through it as part of preparation for this workshop?
2. Do you feel that the PRFAB needs to be modified in any way or is it currently fit for purpose? Please provide details. As a guide, please consider providing feedback on subjects:
 - a. Scope: is this adequate or does it need to be modified,
 - b. Priorities: do the current two priorities meet your needs
 - c. Workplan: is the workplan appropriate. Is it too ambitious, achievable, or requires modification?
 - d. Are there any other items or suggestions that you would like to make comment on?
3. Which aquatic biosecurity deficiencies could be best addressed through a collaborative regional approach?
4. Would your PICT support the development of standardised regional biosecurity arrangements such as the establishment of translocation pathways from other PICTs for key products, with the aim of reducing overall administrative and assessment burdens and improving efficiencies? (For example, should regional or sub-regional areas in the Pacific be considered as regions of similar disease risk for translocation purposes?)
5. How should biosecurity be addressed within the PRAS, e.g. as a stand-alone section or simply refer to the PRFAB. Please provide reasons for your answer.

Questions presented during the Polynesia workshop only

6. Does your PICT have an agreed policy on aquatic biosecurity? If not, do you plan to develop one? How the PRFAB links with your PICTs national arrangements.
7. Are your aquatic biosecurity institutional arrangements adequate for the biosecurity challenges faced by your country/territory?
 - a. If not, then what are the priority areas that need to be strengthened?
 - b. Who is responsible for determining import controls on aquaculture product, e.g. broodstock, feed, equipment?
 - c. Who is responsible for investigation of disease?

2.2.3. Day 2, Session 2: Aquaculture legislation

This session aimed to address '*Objective 10: Identify where gaps occur in policy, legislation, and planning, and assess how these may be addressed*' that was added to the nine objectives previously outlined in the Regional Aquaculture Assessment.

Questions in this section were designed to highlight gaps in legislation, policy, or planning requirements. They focused on both institutional frameworks as well as legal frameworks for aquaculture. Workshop facilitators focused discussions on how aquaculture policies could be addressed by a regional focus rather than individual PICTs.

Group questions

1. Does your PICT have clear legal pathways for (i) allocation of space for aquaculture enterprises, (ii) consideration of objections by stakeholders, (iii) environmental management of aquaculture (such as through regulation or licence conditions)?
2. Are there any identified gaps in legislation, regulations or policies relating to aquaculture?
3. Are there regulations in place to control aquaculture inputs quality and origin (feed, drugs, etc.)? Are these required? Could this be addressed at a regional level?

Questions presented during the Polynesia workshop only

4. Are there policies or legislation that enable investment by private enterprises in commercial aquaculture, or are the laws and policies considered to be barriers to the development of aquaculture? If so, how can laws and policies be improved to promote investment in the aquaculture sector?

2.2.4. Day 3, Session 1: Aquaculture economics

The aquaculture economics session aligned with three objectives listed within the Regional Aquaculture Assessment report,

- *Objective 2: To identify how aquaculture production of edible and non-edible aquatic products can improve income and food security in the commercial, community and small holder subsectors.*
- *Objective 6: To assess and improve domestic, regional, and global market access and supply chains.*
- *Objective 7: To assess and enhance quality of post-harvest product.*

The goal of this session was to assess how economic and marketing factors contributed to or inhibited aquaculture development. Participants were asked to discuss if aquaculture was assisting in economic development or whether the primary focus of development was food security. Feedback was also invited success stories and non-success stories, i.e. where aquaculture projects have worked, and if not, why not.

Discussions aimed to identify current obstacles and needs required to develop both domestic and international markets and the challenges of transport and supply chains. For example, was there limited access to finance; a lack of capacity to comply with international markets requirements, or a lack of transport limiting sale of product. Discussions considered how the PRAS could assist in overcoming these problems.

The term 'branding' was used in the questions below to describe the development of a marketing programme based on promoting product from the Pacific as being of high quality or having unique qualities.

Group questions

1. Is the focus of aquaculture development in your PICT based around food security, economic development, environmental mitigation, or other reasons. In you answer please identify your focus, and any additional aquaculture commodities that you would like to develop.
2. What are the challenges of current commodities (e.g. supply chains post-harvest quality, market access etc) and describe what you feel can be done to address these challenges and how these might be addressed within a PRAS? For example, do you see opportunities for market development through regional branding and promotion to capitalise on regional advantages?
3. Is post-harvest quality an area that requires further development in your PICT, and if so, where would you rank this in your list of needs?
4. Are food safety testing and quality assurance programmes important to you? If yes, please explain why. How could a PRAS assist in this?

Questions presented during the Polynesia workshop only

5. Is post-harvest quality an area that requires further development in your PICT, and if so, where would you rank this in your list of needs?
 - a) What major preprocessing (spoilage avoidance) and value-adding opportunities exist at the post-harvest points of aquaculture value chains?
 - b) Are food safety testing and quality assurance programmes important to you? If yes, please explain the reasons for this.
 - c) How could a PRAS assist in improving post-harvest quality?
6. What are the pitfalls of current commodities (e.g. post-harvest and quality) and their markets and what can be done to address and improve these?
7. What do you see as the challenges to market access or development for aquaculture product? How do you feel that these should be addressed within a PRAS?
8. What do you see as the challenges of supply chains for aquaculture supplies and produce? How do you think that these should be addressed within a PRAS? For example, feed, spat supplies (oysters), broodstock (tilapia).
9. What do you see as the opportunities for market development for aquaculture product? Is there scope for branding as a market opportunity, to capitalise on our regional advantages, or to unify/share market promotion costs?

2.2.5. Day 4, Session 1: Environment/climate change resilience and cross-cutting issues

The Environment/climate change resilience and cross-cutting issues session aligned with two objectives of the of the Regional Aquaculture Assessment.

- *Objective 5: To assess the resilience of aquaculture to climate change and other natural disasters in the region and develop outline plans for mitigating measures.*
- *Objective 9: To include cross cutting issues such as health, environment, and gender in aquaculture development discussions.*

The purpose of this session was to discuss climate change, environmental, social equity and other crosscutting issues that could be addressed through aquaculture development.

In the first part of this session, participants were asked their opinions on how aquaculture was affected by natural disasters and climate change as well as how it might be used to mitigate against these. Climate change effects can include slow onset processes such as sea level rise, ocean acidification, increased water temperature; whilst increased frequency of natural disaster events such as cyclones and flooding are examples of shorter-term risks. Discussions also considered how a regional approach, e.g. regional research, could be used to promote aquaculture resilience in the face of climate change and environmental disasters.

The second part of the session concentrated on other cross-cutting issues, such as human health, environmental mitigation and social equity.

Group questions

1. What are the climate change and natural disaster challenges facing aquaculture in your PICT/region? Include in the answer examples of impacts.
2. Are your identified aquaculture production areas susceptible to the effects of climate change or natural disasters? If yes, do you feel that these challenges are best addressed through,
 - a. A change in location,
 - b. A change in culture species, or
 - c. Changes in production and infrastructure design.
 - d. Can you suggest any aquaculture mitigation measures that could be investigated?
 - e. Are there existing mitigation measures your country has for climate change which can be incorporated with aquaculture?

3. Are there equity or social inclusion issues (both positive and negative) in your aquaculture sector that need to be addressed? For example,
 - a. Does capacity-building reach those who do the daily work?
 - b. Are there barriers to anyone wanting to meaningfully engage in aquaculture (access to needed resources, decision-making processes, etc).
4. Are there any aquaculture activities being used for environmental mitigation (e.g. re-stocking). Would you like to develop this area further?
5. Are there any aquaculture activities that impact (both positively and negatively) on human health (e.g. safe nutritious food, potential for food safety risks). How do you think that these could be promoted or mitigated?
6. Do you have any other comments?

Questions presented during the Polynesia workshop only

7. Which aquaculture activities contribute to better access to food needs in your country? Which additional areas would you like to develop (for food production)?
8. Are there any aquaculture activities that provide economic benefits (e.g. livelihoods, income, employment)? What additional areas would you like to develop (for economic development)?

2.3. Potential priority activities

Following the workshop discussions, break-out group participants were asked to prioritise activities that could potentially be included in a regional strategy. Participants were provided with the option of either identifying their top three priorities from the list provided or adding additional priorities. Together there were 43 priority activities identified across the five session themes. These activities are provided in Table 1., whilst results of priority ranking are provided in *Appendices (6.2.6. Day 5, Regional Priorities Session)*.

Table 1. List of potential priority activities that may be included in the PRAS, presented to sub-regional and regional workshop participants for ranking

Code	Activity
General aquaculture and aquaculture technologies	
A1	Development of new endemic culture species
A2	Introduction of culture species from other regions
A3	Establishment or development of hatcheries within the Pacific region that can supply multiple countries with seed-stock
A4	Development of regional aquaculture feed mills
A5	Development of feed supply chains from accredited sources
A6	Development of micro-hatchery technology
A7	Development of non-fed aquaculture
A8	Development of an aquaculture training programme provided by an accredited provider, with qualifications recognised throughout the Pacific
A9	Establishment of a staff exchange programme between PICTs to provide training and mentoring
A10	Improve access to aquaculture supplies and equipment
A11	Establishment of regional database
A12	Other: Development of political support
A13	Development of integrated aquaculture systems

Table 2. continued.

Code	Activity
Aquatic biosecurity	
B1	Development of a regional diagnostic laboratory network
B2	Development of a generic training programme for aquatic biosecurity and disease investigation
B3	Development of sample transport procedures to facilitate rapid submission to diagnostic laboratories
B4	Development of aquatic units within the PHOVAPS paravet programme
B5	Development of emergency response training/rapid response team programmes
B6	Establish rapid diagnostic assessment teams that can assist PICTs during disease outbreak events
B7	Development of MOU between SPC and WOA on aquatic disease
B8	Closer working linkages with PHOVAPS on aquatic biosecurity and disease issues
B9	Investigate common disease and pest introduction pathways, including risks associated with ballast water and biofouling
B10	Establishment of safe importation pathways
B11	Other: Develop national aquatic biosecurity systems

Aquaculture legislation	
F1	Investigate legal requirements required to support sample submission to laboratories (B3)
F2	Support updating existing aquaculture legislation and new aquaculture legislation by promoting greater understanding and consistency of legislation across the region
F3	Mapping of usage of public maritime domain for potential areas suitable for aquaculture
F4	Develop regional templates for development of specific areas of legislation and regulation supporting aquaculture development

Aquaculture economics (and value-adding)	
C1	Development of bivalve quality assurance programmes
C2	QAP and HACCP training
C3	Regional approach to ciguatera toxicity
C4	Development of baseline database on aquatic foodborne pathogens
D1	Develop a regional branding and/or marketing campaign
D2	Establishment of a collaborative approach to ensure consistency of supply
D3	Establish certification/accreditation programme for high value products (e.g. pearls)
E1	Investigate sources of finance for aquaculture development

Environment/climate change resilience and cross-cutting issues (including social issues)	
H1	Development of disaster resilient aquaculture practices
H2	Development of restorative aquaculture techniques
H3	Development of integrated aquaculture techniques
H4	Investigation of techniques that have potential to provide resilience to climate change impacts (e.g. increased water temperature, increased acidification) for aquaculture
I1	Closer collaboration with international organisations, including CROP agencies, on aquaculture and biosecurity issues
G1	Greater social inclusion in planning
G2	Inclusion of aquaculture in community-based fisheries

3. PACIFIC REGIONAL AQUACULTURE STRATEGY CONSULTATION WORKSHOP

A final virtual regional PRAS consultation workshop, *Pacific Regional Aquaculture Strategy Consultation Workshop* was conducted on 6-8th August 2024 to discuss findings from the sub-regional PRAS workshops and the identified priorities as part of preparations for drafting of the PRAS.

PICT members were requested to nominate two official representatives to attend this workshop and nominated representatives were given the opportunity to review findings from the sub-regional workshops and agree on priorities.

3.1. Format, and agenda of workshop

The workshop was conducted over three morning sessions, each lasting three hours.

Items covered during the workshop were:

- (a) Background to the PRAS and findings from the three sub-regional workshops (Day 1).
- (b) Facilitated Break-out groups to discuss sub-regional priorities (Day1 and Day2). In these break-out group sessions representatives were asked:
 - *Do you agree with your PICT priority rankings from the sub-regional workshops?*
 - *Would you like to make any changes?*
 - *What are the sub-regional priorities*
- (c) Plenary session discussion agreed regional priorities for the PRAS (Day 2 and Day 3)
- (d) Final presentation on the PRAS documentation and anticipated timelines (Day 3)

3.2. Ranking and endorsement of regional priorities for the PRAS

During the break-out group sessions, each PICT either confirmed or adjusted their priority activities for each session theme, as outlined in Table 1. Some countries ranked priority activities from 1 to 3 as requested, whilst others identified a range of priority activities with more than three priorities identified (see Table 3). This required facilitators to develop a process of weighted scoring so that each PICT had equal input into the final ranking. To achieve this, results from the break-out group sessions were consolidated and ranked using the approach described below.

- (a) *Priority activity weighting by session:* Each priority activity in each session was given a proportional score by dividing the number of activities in the session by the total number of activities in all sessions.
- (b) *Country priority activity weighting:* Since some countries did not rank priority activities or identified more than three activities (Table 3), each set of activities identified by individual PICTs was given a total score of three. For example, if more than three activities were identified, the individual activities received a final value less than 1. If less than three activities were identified, each priority received a score more than three.
- (c) The final ranking score for each activity was then determined by multiplying the *Priority activity weighting by session* by the *Country priority activity weighting*, and then summing these together for all PICTs.

These results were tabulated by PICT for each session theme (Table 3) and summarised graphically (Figure 1). Finally, these were then combined into a list of the highest 15 ranked priority activities (Table 5). All priority activity rankings were summarised in Figure 2. These results were presented to the PICT representatives for endorsement and inclusion in the PRAS.

Table 3. Summarised priority PRAS activities identified by countries

MELANESIA					MICRONESIA					POLYNESIA								
Fiji	NC	PNG	SOL	VU	CNMI	FSM	Guam	Kiribati	Nauru	Palau	RMI	PF	Samoa	CK	Tonga	ASM	W&F	TUV

General aquaculture and aquaculture technologies

A1	Development of new endemic culture species				1	1	1			1	1	1	1	1	2	1	2	
A2	Introduction of culture species from other regions				1	1					1		1	1				
A3	Establishment or development of hatcheries within the Pacific region that can supply multiple countries with seed-stock	1				1							2	1				
A4	Development of regional aquaculture feed mills		1	1			1	1		1					2			
A5	Development of feed supply chains from accredited sources	1	2		1				1				2					
A6	Development of micro-hatchery technology			1	1								2				2	
A7	Development of non-fed aquaculture				1							1						
A8	Development of an aquaculture training program provided by an accredited provider, with qualifications recognised throughout the Pacific			1	1			1	1			1		1		1		1
A9	Establishment of a staff exchange program between PICTs to provide training and mentoring	1			1	1	1		1	1	1	1	1	1	2		2	1
A10	Improve access to aquaculture supplies and equipment							1			1	1	1		1	1		1
A11	Establishment of regional database							1		1			1					
A12	Other: Development of political support		1													1		
A13	Development of integrated aquaculture systems	1	1		1						1	2						3

Aquatic biosecurity

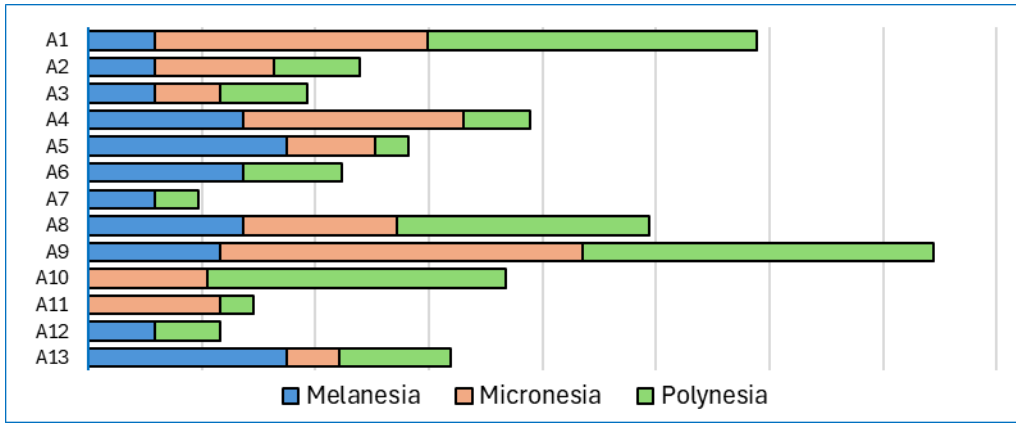
B1	Development of a regional diagnostic laboratory network			1	1	1	1	1	1	1	1	1	1	1	2		2	
B2	Development of a generic training program for aquatic biosecurity and disease investigation	1		1	1	1	1	1	1	1	1	1	2	1	2		2	1
B3	Development of sample transport procedures to facilitate rapid submission to diagnostic laboratories													1				
B4	Development of aquatic units within the PHOVAPS paravet program	1					1	1		1			1					
B5	Development of emergency response training/rapid response team programs	1	1				1						1					
B6	Establish rapid diagnostic assessment teams that can assist PICTs during disease outbreak events		1		1		1	1			1		1					
B7	Development of MOU between SPC and WOA on aquatic disease									1			1					
B8	Closer working linkages with PHOVAPS on aquatic biosecurity and disease issues		1	1									2					
B9	Investigate common disease and pest introduction pathways, including risks associated with ballast water and biofouling	1	1		1	1	1	1		1	1	1		1	2	1	2	1
B10	Establishment of safe importation pathways		1						1		1		1	1				1
B11	Other: Develop national aquatic biosecurity systems				1			1					2	1				

Table 3. Summarised priority PRAS activities identified by countries (continued)

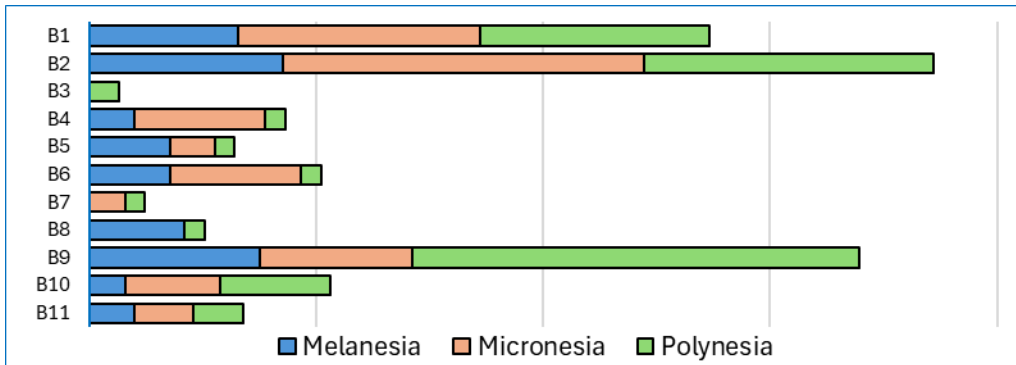
		MELANESIA					MICRONESIA						POLYNESIA								
		Fiji	NC	PNG	SOL	VU	CNMI	FSM	Guam	Kiribati	Nauru	Palau	RMI	PF	Samoa	CK	Tonga	ASM	W&F	TUV	
Aquaculture legislation																					
F1	Investigate legal requirements required to support sample submission to laboratories (B3)	1		1	1	1	1	1	1	1		1			1					1	
F2	Support updating existing aquaculture legislation and new aquaculture legislation by promoting greater understanding and consistency of legislation across the region		1	1			1	1	1	1		1			2		2			1	
F3	Mapping of usage of public maritime domain for potential areas suitable for aquaculture	1	1	2	1	1			1			1	1	1	2				2	1	
F4	Develop regional templates for development of specific areas of legislation and regulation supporting aquaculture development											1		1	2		1		2		
Aquaculture economics (including value-adding)																					
C1	Development of bivalve quality assurance programs	1					1					1	1		2				2		
C2	QAP and HACCP training			1	1	1	1	1	1	1	1	1	1		2		2			1	
C3	Regional approach to ciguatera toxicity					1		1			1	1			2	1	2			1	
C4	Development of baseline database on aquatic foodborne pathogens		1	1	1				1						1					1	
D1	Develop a regional branding and/or marketing campaign				1		1		1		1	1	1		2						
D2	Establishment of a collaborative approach to ensure consistency of supply				1	1		1		1	1		1		2		2				
D3	Establish certification/accreditation program for high value products (e.g. pearls)	1		1	1	1		1	1	1					2		2			1	
E1	Investigate sources of finance for aquaculture development		1	1	1		1	1	1	1	1	1	1	1	2	1	2	1	2	1	
Environment/climate change resilience and cross-cutting issues																					
H1	Development of disaster resilient aquaculture practices			1		1	1	1	1	1	1	1	1	1	2	1	1			1	1
H2	Development of restorative aquaculture techniques	1		1	1			1	1	1		1			1						
H3	Development of integrated aquaculture techniques		1		1	1	1		1		1	1	1	1	2				2	1	
H4	Investigation of techniques that have potential to provide resilience to climate change impacts (e.g. increased water temperature, increased acidification) for aquaculture	1	1	1	1	1	1	1		1	1	1	1		3	1	1			1	
I1	Closer collaboration with international organisations, including CROP agencies, on aquaculture and biosecurity issues	1	1		1		1	1	1	1	1	1	1	2	3	2	1	1		2	
G1	Greater social inclusion in planning	1				1			1	1	1	1	1	1	2	1		1		1	
G2	Inclusion of aquaculture in community-based fisheries	1	1	1		1		1	1	1	1	1	1	1	3	1	1		1	1	

* Colour code: Green = Priority 1, Pink = Priority 2, Red = Priority 3.

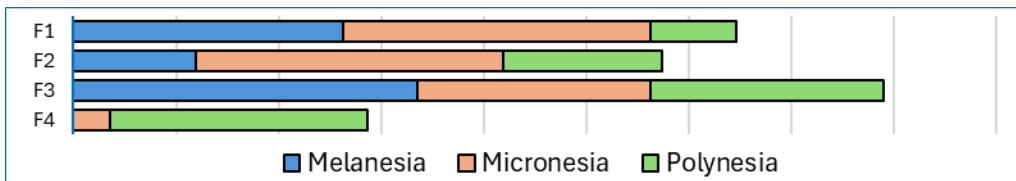
General aquaculture and aquaculture technologies priorities



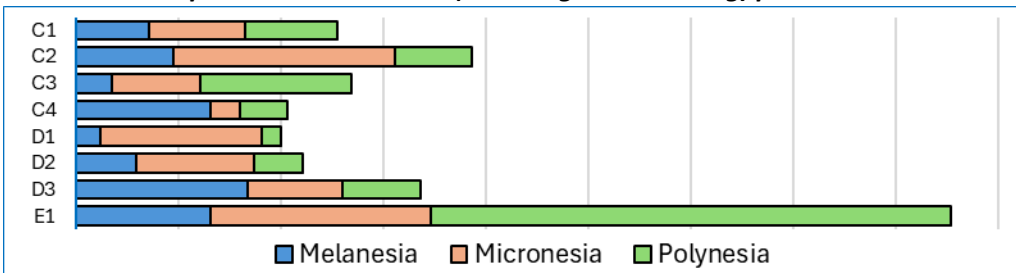
Aquatic biosecurity priorities



Aquaculture legislation priorities



Aquaculture economics (including value-adding) priorities



Environment/climate change resilience and cross-cutting issues priorities

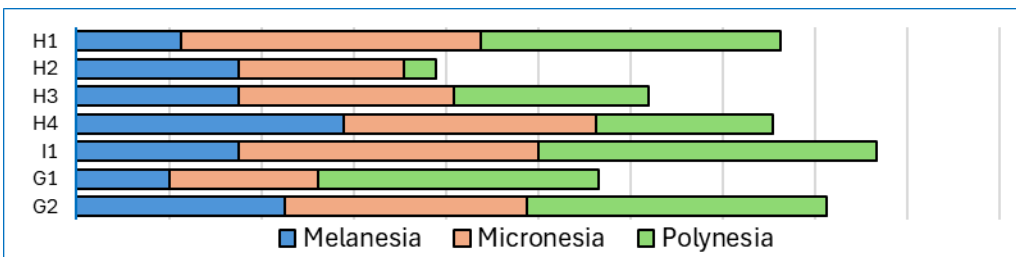


Figure 1. Ranked PRAS priority activities by session theme.

Table 4. List of top three priorities put forward at the Pacific Regional Aquaculture Strategy Consultation Workshop^b

b: In some cases, PICTs provided more than three priorities. Where this occurs, the additional priorities are shown in grey text.

Country	Priority
MELANESIA	
Fiji (FJ)	<ol style="list-style-type: none"> 1. Biosecurity (food safety and disease surveillance). 2. Hatchery and farm equipment, and feed research (low-cost feed whilst maintaining crude protein). 3. Marketing (cold chain development and development of export markets).
New Caledonia (NC)	<ol style="list-style-type: none"> 1. Biosecurity (food safety and disease surveillance). 2. Feed research (using locally sourced raw materials, or investigate safe import of materials, need to establish consistency of supply of high-quality products for feed manufacture). 3. Regional training programme for aquaculture. 4. Integrated multi-trophic aquaculture (e.g. rabbitfish and shrimp or using tilapia ponds as nutrient supply to support agriculture).
Papua New Guinea (PG)	<ol style="list-style-type: none"> 1. Feed and hatchery development (development of feed for commonly farmed fish species, satellite hatcheries for tilapia, and hatchery development of high value export species e.g. sea cucumber). 2. Biosecurity/disease surveillance. 3. Regional training programme for aquaculture.
Solomon Islands (SB)	<ol style="list-style-type: none"> 1. Biosecurity (in-line with session priorities). 2. Marketing (in-line with session priorities). 3. Hatchery development, plus innovative technology and tools (e.g. innovative techniques to improve production, micro-hatchery development).
Vanuatu (VU)	<ol style="list-style-type: none"> 1. Feed research (feed development using affordable ingredients). 2. Biosecurity. 3. Marketing (Product development and pathways for marketing). 4. Aquaculture farm development (developing farm systems according to PICTs specific situations).
MICRONESIA	
Guam (GU)	<ol style="list-style-type: none"> 1. Development of aquaculture facility (for training and development). 2. Access to funding for commercialisation. 3. Development of new species “native/endemic species”, and also introduced (Biosecurity and development of regional diagnostic facility and training). 4. Local feed production.
Kiribati (KI)	<ol style="list-style-type: none"> 1. Development of local feed mill (alternative local feed ingredients) that can supply region. 2. Attract investors in developing aquaculture 3. Capacity building for biosecurity.
Nauru (NR)	<ol style="list-style-type: none"> 1. Technical capacity building in aquaculture (to include the private sector) through peer-to-peer exchanges. 2. Developing best practices and standards in food safety. 3. Developing best practices in environmentally friendly operations. 4. Finance to support small aquaculture operations for food security (re-evaluate CROP grants for food security in preference to commercial operations). 5. Legislation.

Country	Priority
RMI (MH)	<ol style="list-style-type: none"> 1. Technical capacity building across all aspects of aquaculture. 2. Increase aquaculture production in communities. 3. Technical capacity building in biosecurity (SOP's/ standards for translocation). 4. Development of finance options. 5. Private sector peer-to-peer knowledge sharing.
FSM (FM)	<ol style="list-style-type: none"> 1. "Kosrae"- Infrastructure development of aquaculture facilities at state level (Note: may not be relevant to regional strategy). 2. Technical capacity development across all aspects of aquaculture. 3. Marketing development. 4. Development of new species (native or introduced). 5. Development of biosecurity protocols for introduction of exotic species. 6. Value adding to products. 7. Review current aquaculture legislation and development of these (Note: may not be relevant to regional strategy).
Palau (PW)	<ol style="list-style-type: none"> 1. Increase production and distribution of seed stock for existing aquaculture programmes. 2. Identify sub-regional and regional training centres. 3. Regional business planning for aquaculture enterprises. 4. Technical capacity building across all aquaculture aspects.
POLYNESIA	
French Polynesia (PF)	<ol style="list-style-type: none"> 1. Increase and sustainably control aquaculture production, particularly through an increase in skills, know-how and innovative modern techniques (i.e. Artificial Intelligence). 2. Adopt eco-responsible production by following good practices and ensuring biosecurity, with the support of the SPC and experts from the region. 3. Regulate aquaculture sectors in an integrated manner in the Polynesian context(s), and develop regional partnerships, particularly between Oceanians.
Cook Islands (CK)	<ol style="list-style-type: none"> 1. Hatchery-based Operational & Practical Plans for Black Pearl spat production, giant clams, and sea cucumber, Including staff training. 2. T Community-based aquaculture production, e.g., milkfish, including restocking of ponds with fingerlings to potential sites on some of the islands, Mitiaro. 3. Review the national Aquatic biosecurity strategy for its effectiveness and identify key areas that needs to be improved.
Tonga (TO)	<ol style="list-style-type: none"> 1. Increase aquaculture production through climate change resilience techniques and practices such as feed research, access to aquaculture supplies and equipment. 2. Sustainability. 3. Implementation of the National Aquatic Biosecurity framework / strategy.
Samoa (WS)	<ol style="list-style-type: none"> 1. Improved production efficiency, increased production of commodities to support communities. 2. Development of a national aquatic biosecurity system. 3. Improved Legislation, with emphasis on F2 and F3 (Table 2). <p>Note: Samoa consider capacity development a cross-cutting issue.</p>
Wallis and Futuna (WF)	<ol style="list-style-type: none"> 1. Supporting the development of single and multi-species production models adapted to the scale of the region, with low environmental, technical and financial risk, through to the dissemination of controlled technical itineraries: giving priority to native species, developing hatchery models with accessible costs and

Country	Priority
	<p>technology, identifying priority productions likely to rely on regional sources of biological material and defining secure transfer protocols.</p> <ol style="list-style-type: none"> 2. Facilitating decision-making in the public and private sectors by providing decision-support tools and expertise in risk analysis. 3. Strengthen national public and private sector capacity to support and supervise all aspects of aquaculture development (technical, biosafety, legal): by disseminating technical information, structuring regional training and expertise, mobilizing a network of model farms for practical training and facilitating peer-to-peer exchanges between "qualified" reference producers and novice producers.
Tuvalu (TV)	<ol style="list-style-type: none"> 1. Feed and hatchery development (i.e. research on local feeds, hatchery development for clams/milkfish, etc.). 2. Staff technical capacity building training of staffs in aquaculture. 3. Biosecurity SOP's best practice procedures.
American Samoa (AS)	Not present at final workshop

3.2.1. Top 15 ranked priority activities

The top 15 ranked priority activities, in order of priority, identified at the *Pacific Regional Aquaculture Strategy Consultation Workshop* are provided in Table 5. Ranking of other priorities is provided in Figure 2.

Table 5. Highest 15 ranked priority activities, in order of priority, identified at the Pacific Regional Aquaculture Strategy Consultation Workshop

Rank	Code	Description
1	B2	Development of a generic training programme for aquatic biosecurity and disease investigation
2	E1	Investigate sources of finance for aquaculture development
3	B9	Investigate common disease and pest introduction pathways, including risks associated with ballast water and biofouling
4	A9	Establishment of a staff exchange programme between PICTs to provide training and mentoring
5	B1	Development of a regional diagnostic laboratory network
6	A1	Development of new endemic culture species
7	A8	Development of an aquaculture training programme provided by an accredited provider, with qualifications recognised throughout the Pacific
8	I1	Closer collaboration with international organisations, including CROP agencies, on aquaculture and biosecurity issues
9	G2	Inclusion of aquaculture in community-based fisheries
10	F3	Mapping of usage of public maritime domain for potential areas suitable for aquaculture
11	A4	Development of regional aquaculture feed mills
12	C2	QAP and HACCP training
13	H1	Development of disaster resilient aquaculture practices
14	H4	Investigation of techniques to provide resilience to climate change impacts
15	A10	Improve access to aquaculture supplies and equipment

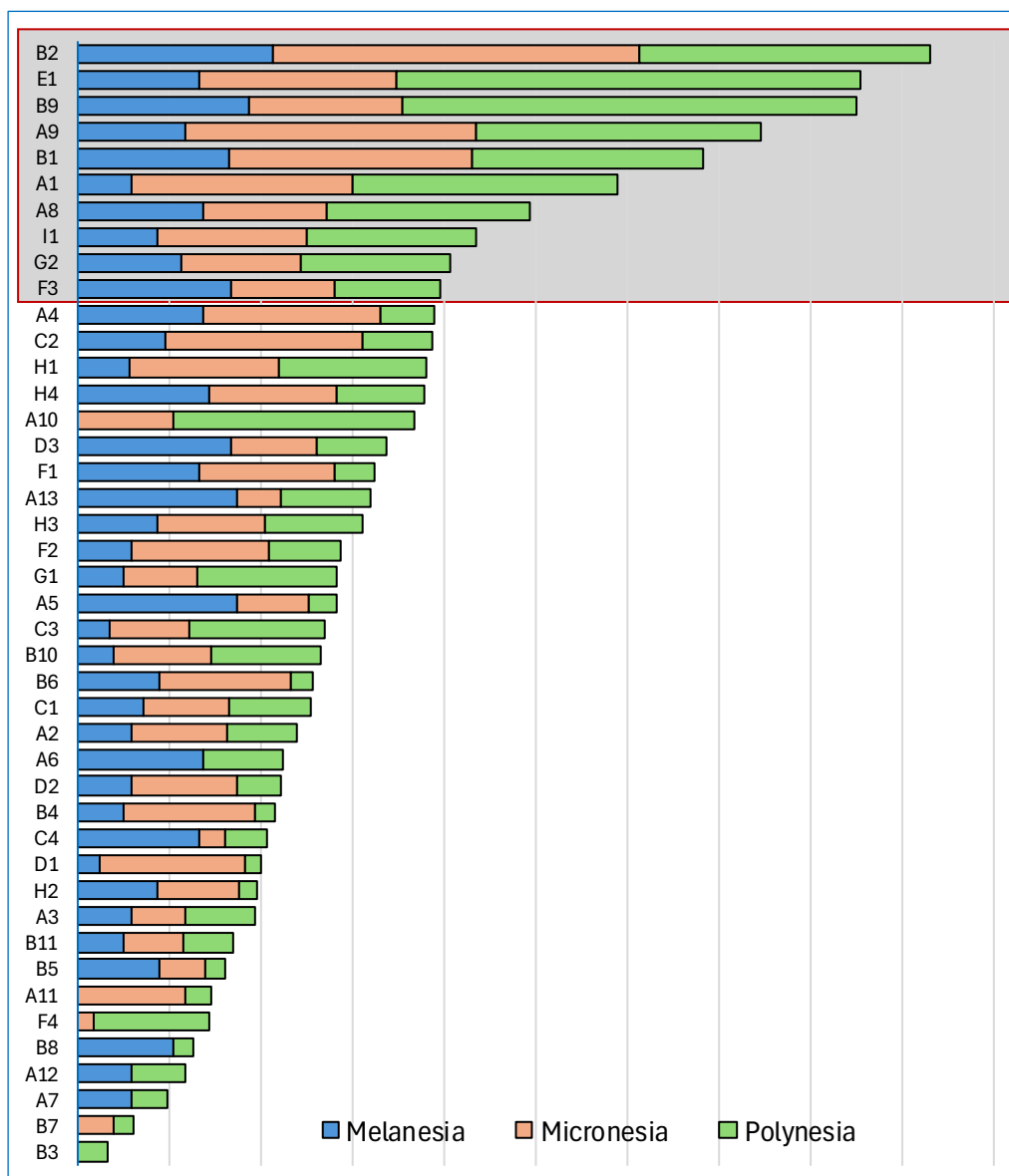


Figure 2. Ranking of PRAS priorities identified at the Pacific Regional Aquaculture Strategy Consultation Workshop. Highest 10 priority activities highlighted in the red box (see Table 1 for description of codes).

3.3. Aquatic biosecurity in the PRAS in relation to the PRFAB

During the sub-regional workshops participants were asked, *how should biosecurity be addressed within the PRAS, e.g. as a stand-alone section or simply refer to the PRFAB?* (see Section 2.2.2). There was consensus amongst the group that a section on aquatic biosecurity should within the PRAS and that both documents should reference each other to ensure consistency and avoid duplication (see Appendix Section 6.3.2).

This approach also recognised that some priority actions in the PRAS may be dealt with via the PRFAB whilst other biosecurity issues would be better addressed through the PRAS, e.g. development of a diagnostic network or development of food safety programmes.

4. DISCUSSION AND CONCLUSIONS

The sub-regional workshops and the follow-up *Pacific Regional Aquaculture Strategy Consultation Workshop* provided open and free forums to discuss aquaculture development across the region and helped identify regional priority activities for inclusion in the strategy. These were ranked using a weighted approach described in section 3.2 and taking into account all priorities identified by each country (Figure 2 and Table 5).

The PRAS is not expected to be an exhaustive “wish-list” of priority actions, which would make the document unwieldy unlikely to achieve its objectives. Instead, the PRAS aims to guide aquaculture development in the region by focusing on areas of highest priority. The highest 15 ranked priority activities identified were grouped into common action themes and sub-themes for inclusion in the PRAS. This approach allowed for addition of some lower ranked priorities under sub-themes where considered necessary, for example development of a region laboratory diagnostic network (B1) would also require development of diagnostic sample transport procedures that complied with biosecurity regulations (B3).

These PRAS priorities and action themes were presented to the PICT representatives at the final day of the *Pacific Regional Aquaculture Strategy Consultation Workshop* where they were strongly endorsed by those present. Consequently, these themes were used to form the basis of the PRAS.

4.1. Regional priority action themes for the strategy.

In the section below the Alpha-numeric codes in brackets refer priority activities outlined in Table 1. Alpha-numeric codes in brackets that are in bold and highlighted were amongst the highest 15 ranked priority activities identified during the *Pacific Regional Aquaculture Strategy Consultation Workshop* (Table 5) whereas alpha-numeric codes in brackets that are not in bold and not highlighted are lower ranked priority actions.

Sustainable aquaculture technology

1. Develop new production species including:
 - a. Prioritising “native/endemic/indigenous species” (**A1**).
 - b. Low-trophic species (e.g. sea cucumbers, trochus, oysters, seaweeds), to reduce the need of dedicated feed (A7).
 - c. Species suitable for multi-trophic aquaculture (e.g. rabbitfish and shrimp) and integrated agri-aquaculture (e.g. using tilapia ponds as nutrient supply for irrigated agriculture) (A13).
2. Foster technical capacity building in aquaculture through regional training programmes for aquaculture to increase skills and adoption of innovative and modern techniques, including:
 - a. Peer-to-peer knowledge sharing, staff exchange programmes, training and mentoring that is inclusive of both government and private sectors (**A8** and **A9**).
 - b. Training using accredited providers, with qualifications recognised throughout the Pacific (**A8**).
 - c. Establishment of regional databases of technical knowledge and experts (A11).
 - d. Development of model farms for practical training.
3. Develop a regional feed and feed mill(s) and a feed research facility to (**A4**):
 - a. Develop feeds for commonly farmed fish species (e.g. tilapia) using affordable ingredients and locally sourced raw materials (whilst maintaining crude protein) (including algae).
 - b. Investigate safe import of feed materials (biosecurity imperatives).
 - c. Ensure consistent supply of high-quality products for feed manufacture.
 - d. Ensure reliable feed supply chains from accredited sources (A5).
4. Establish or develop in-country and regional hatcheries to:
 - a. Supply seedstock to multiple countries for grow-out (A3).
 - b. Support development of in-country (satellite) hatcheries and rural micro-hatcheries included selected broodstock and hatchery technologies (A6).

- c. Develop culture techniques for new “native/endemic/indigenous” species (A1).
5. Establish or develop culture systems models and guidelines for:
 - a. Multi-trophic aquaculture and integrated agri-aquaculture (A13, H3).
 - b. Aquaculture farm & infrastructure development for new “native/endemic/indigenous” species (A1), and environmental and climate change resilience (H1, H3).

Aquatic Biosecurity

1. Develop a regional diagnostic laboratory network to support disease diagnoses, research and surveillance (B1, B4, B8)
2. Capacity building. Develop a regional technical training programme for aquatic biosecurity and disease investigations (B2), including
 - a. Emergency response and rapid diagnostic assessment training and simulated exercises (B5 and B6)
3. Develop biosecurity standard operating procedures and processes for:
 - a. Introductions and translocations aquatic organisms and associated resources (e.g. people, equipment and feeds) between countries and between facilities within countries (A2, B10).
 - b. Sample transport to facilitate rapid submission to diagnostic laboratories (B3).
4. Investigate common disease and pest introduction pathways, including risks associated with ballast water and biofouling (B9).

Legislation and regulation

1. Support mapping of coastal and maritime domain for potential areas suitable for aquaculture, including identification of ownership, legal security/tenure, and use (e.g. community, cultural, conservation and tourism) (F3).
2. Support updating existing aquaculture legislation and new aquaculture legislation by promoting greater understanding and consistency of legislation across the region (F2).
3. Develop regional templates for development of specific areas of legislation and regulation supporting aquaculture development (F4).

Economic development, livelihoods and food security

1. Investigate sources of finance and funding opportunities for aquaculture development by both commercial-scale and small-farmer (community) operations (E1).
 - a. May include developing tools for attracting funds (such as business plans).
2. Develop post-harvest and value-adding processing practices to improve food safety and product quality, including regional QAP and HACCP training programme for farmers (C2)
3. Foster closer collaboration with international organisations, including CROP agencies, on aquaculture and biosecurity issues (I1 and I2).

Social inclusion

1. Foster integration of aquaculture in community-based fisheries developments promote gender equity, disability and social inclusion, and people centred approaches. (G2).

Environmental and climate change resilience

1. Develop and promote disaster resilient aquaculture (H1), such as through:
 - a. Access to early warning systems for rural and remote communities.
 - b. Improving aquaculture infrastructure (e.g. design of ponds and cages, power supply, water supply systems).
 - c. Identifying of farming areas less affected by environmental disasters.
 - d. Developing disaster preparedness, response and recovery plans.
 - e. Improving access to aquaculture supplies and equipment (A10).

- Investigate techniques that have potential to provide resilience to climate change impacts (e.g. increased water temperature, increased acidification) for aquaculture (H4), such as through species selection, culture techniques, location, and farm design.

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6. APPENDICES

6.1. Abbreviations and country codes

BAF: Biosecurity Authority of Fiji

DRM: Directorate of Marine Resources (French Polynesia)

EIS: Environmental Impact Assessment

EPA: Environmental protection agency

NFA: National Fisheries Authority (PNG)

HAACP: Hazard Analysis Critical Control Point

MASA: Micronesian Association for Sustainable Aquaculture

MoFF: Ministry of Fisheries and Forestry (Fiji)

NAQIA: National Agriculture Quarantine and Inspection Authority (PNG)

PHOVAPS: Pacific Heads of Veterinary and Animal Production Services.

PICTs: Pacific Island Countries and Territories.

PRAS: Pacific Regional Aquaculture Strategy

PRFAB: Pacific Regional Framework of Aquatic Biosecurity

USP: University of the South Pacific

WOAH: World Organization for Animal Health

Country codes

Melanesia	Fiji	FJ	FJI
	New Caledonia	NC	NCL
	Papua New Guinea	PG	PNG
	Solomon Islands	SB	SLB
	Vanuatu	VU	VUT
Micronesia	Micronesia (Federated States of)	FM	FSM
	Guam	GU	GUM
	Kiribati	KI	KIR
	Marshall Islands (the)	MH	MHL
	Northern Mariana Islands (the)	MP	MNP
	Nauru	NR	NRU
	Palau	PW	PLW
Polynesia	American Samoa	AS	ASM
	Cook Islands (the)	CK	COK
	Niue	NU	NIU
	French Polynesia	PF	PYF
	Pitcairn	PN	PCN
	Tokelau	TK	TKL
	Tonga	TO	TON
	Tuvalu	TV	TUV
	Wallis and Futuna	WF	WLF
	Samoa	WS	WSM

6.2. List of invested regional workshop PICT participants

PICT	Direction	Name	Email
New Caledonia	DAVAR Direction des Affaires Vétérinaires Alimentaires et Rurales	Stéphanie SOURGET	stephanie.sourget@gouv.nc
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	Collectivities : Province des iles Loyauté - Observer	Billy WAPOTRO	b-wapotro@loyalty.nc
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6.3. Consolidated Sub-Regional Workshop break-out group discussions

See Appendix 6 - <https://www.spc.int/digitallibrary/get/fmh2n>

6.4. Examples of aquaculture success stories in PICTs

MELANESIA

Fiji

- Successful breeding of rabbitfish at the Caboni station and working towards grow out production in collaboration with TTM (Taiwan Technical Mission). Successful and commercial breeding/production of *P. monodon*. Sandfish breeding in GoV hatchery.

Papua New Guinea

- Satellite hatchery programmes, with private sectors is sustainable for supply of seedlings to aquaculture farms. Hatcheries were established in various provinces to produce fingerlings for those aquaculture farms within the locations. This programme has been successful as the supply is more consistent compared to when the government hatchery was the sole supplier for fingerlings.

Solomon Islands

- Through technical support from OFCF closed life cycle for *Stichopus horrens*. Collecting juveniles from wild (using local materials).
- Seaweed project, SPC has supported the value adding training and now the communities in Wagina and Shortland's are doing seaweed chips to earn income.

Vanuatu

- For Vanuatu, our success stories would be; 1. Farm to school, 2. farm to hospital and the conversion of communities with protein (lizard) to tilapia farming and consumption. Farm to Table and Farm to School strategic approaches are our two success stories. Seed production of sandfish in hatchery in the private sector. Vanuatu recommends south-south exchange between PICs on success stories transfer of knowledge.

MICRONESIA

Guam

- Governor signed to bring about a section of aquaculture in the department of agriculture (first of its kind). Support in funding, development of policies, qualifying certificates, develop aquaculture holistically.

Nauru

- Milkfish farmer- commercial production and good production and encouraged others to start backyard farms. Fry are still a problem but if available milkfish farming would develop significantly.

Kiribati

- Culture of local micro-algae species for larval feed (stopped importation). Looking at exporting this micro-alga to others in the region (need to identify this micro-algae species). Sea cucumber production has ramped up and successful.
- Sea hare roe – was promoted as safe and healthy and now real success story (hospital did research) (All wild harvest).

RMI

- Teams assist community raceway tanks for self-reliance on giant clams and increased giant clam production. Need to link communities to resource management and aquaculture.

Palau

- Trial phase for Tiger Prawn, Sea Grape, and Sea cucumber are showing promising results.

FSM (including Kosrae and Yap)

- Private hatchery in Kosrae culturing *Tridacna gigas* and now sharing the stock with private sector for farming and restock reefs.
- Culturing of rabbitfish (cage farming) on Pohnpei and now a few farms culturing them. Arranging training for this with other states.
- Other species of giant clams are successful collaborating with the private sector. Community based farming being developed.
- Sea cucumber culture in wild ranching and trochus

- Used to import green snail (*Turbo marmoratus*) from Tonga for spawning but was unsuccessful; will want second re-introduction.
- Mud crab (*Scylla serrata*) hatchery, nursery and grow out successful but no market due to no funding.
- Spawning of *Hippopus hippopus* and *Tridacna derasa* by the College Research Extension and working with State marine division to establish grow-outs in community-managed Marine Protected Areas.

POLYNESIA

American Samoa

- Government led 'no-take-zones' have been successful, 'marine education program' successful education program. Funding from US gov for coastal resilience (tree planting, coral reef restoration). New legislation recognizing coral reefs as natural infrastructure ('Hard Coral Tissue Loss Disease', tsunami, climate change effects).

Tonga

- Mozuku seaweed (main island, private family business with support of Fisheries). Private hatcheries and processing facilities. Provides local employment. Other projects are led by Fisheries. Milkfish (introduced from Philippines) on outer islands. Milkfish project successful (Ha'apai). Another success story is the SMA here in Tonga. We've established 64 SMA communities that available for the communities for aquaculture farming.

Samoa

- Sea grapes and collaboration of Fisheries with 20 villages (harvesting after 6 weeks) leading to strong interest. Tilapia farms increasing in number. Success story for Samoa in terms of tilapia farming, the number of farms has increased as well as the interest in finding market opportunity, compared to the past years when it was only for subsistence family consumption.