Securing coastal fisheries in the Pacific: Critical resources for food, livelihood and community security

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The deteriorating health of Pacific coastal fisheries represents insurmountable security challenges. Years of increasing use and production with little concern for the ecological wellbeing of fisheries resources have resulted in altered and polluted habitats and resource depletion. In addition, Pacific nations have to secure their maritime zones and their resources from better organised, equipped and often unscrupulous operators. They also need to give serious attention to their coastal fisheries.

Coastal areas in the Pacific host important habitats, such as sand and mudflats, seagrass beds, mangroves and coral reefs, all of which must be effectively managed to support the diverse ecological, economic, cultural and social interests of the people. These coastal fisheries provide food security and nutrition, community resilience, economic growth and employment, poverty alleviation and the empowerment of local communities. They are under threat. They consist of subsistence, artisanal and commercial fisheries, as well as aquaculture and recreational fishing – activities that are important but poorly understood despite their economic importance. Coastal fisheries include a diverse range of traditional and contemporary fishing methods and gear that reflect the multiple species fished and are also home to unique marine biodiversity and commercial activities that are vulnerable to intensive resource use. Unfortunately, Pacific islanders have not effectively managed these critical resources and sources of livelihood, causing their decline and eventual collapse. These fisheries are not expected to cope with the combined devastating impact of climate change, over exploitation and worsening pollution.

In addition to these challenges, Pacific small island developing states (SIDS) are scattered across the world's largest ocean where tropical cyclones, storms, floods and droughts represent security threats that Pacific citizens must address to effectively manage their coastal fisheries. Additional security threats such as environmental degradation, globalisation, organised crime, demographic changes, deficient state capacity, poor governance, eroding social cohesion and political crises must also be addressed to ensure the security and continuity of coastal fisheries. Activities required to secure coastal fisheries include controlling overfishing and the degradation of coastal habitats, and empowering all involved stakeholders to be responsible for the health of the coastal environment. In addition, COVID-19 has redefined security in an interdependent world and has reminded humanity that environmental resources have limits that cannot be crossed. COVID-19 has also heightened the need to reconsider our development strategies and the need to focus on the sustainable use of natural resources to support economic development and the wellbeing of our communities. This paper considers the way forward to ensure the long-term security of access to fisheries stocks that are vital to Pacific livelihoods and economies.

Importance of coastal fisheries

Coastal fisheries provide the majority of the local protein supply in the SIDS (Gillett 2011), which makes their security and sustainability critical for nations that have the responsibility to manage these resources and provide for those that rely on their fish catches. These states are working individually and collaboratively to assure the security and sustainability of these resources, requiring innovation and commitment from all stakeholders within the Pacific as well as those from outside.

Coastal fisheries contributed an estimated US$300m (A$390m) annually to the GDP of Pacific SIDS and territories in 2014 (Gillett 2016) and employed around 100,000 people, with subsistence fisheries engaging 10–20 times more people than commercial fisheries (Hanich et al. 2018:279). Women constitute approximately 25 per cent of small-scale fishers and account for 56 per cent of the landings (Harper et al. 2013) that include invertebrates, such as shellfish and holothurians. Fisheries are the main source of protein for Pacific islanders of whom, 89 per cent consume fish weekly (Household Income and Expenditure Survey (HIES) data from 10 PICTs 2012–16). Per capita fish consumption rate is 37 kg per person per annum ranging between 20 kg to 110 kg (HIES data 15 PICTs mainly 2001–06). While human population densities throughout the region have been relatively low until recent times allowing fishing areas to remain productive, development and population growth over the last three decades have resulted in the overexploitation of coastal fisheries, which will soon not meet the requirements in 16 of the 22 Pacific island countries (SPC 2008; Bell et al. 2009).

Security challenges

The management of coastal fisheries is complicated by lack of data, altered ecosystems, high demand, heavy exploitation, uncertain scientific information, unpredictable resource management outcomes, heightened economic development demands and ineffective implementation of management measures (Holland 2010). These factors influence the security of coastal fisheries that are related to the safety of the people involved, food security, ecological security, territorial security and the security of offshore fish stocks. Pacific states must effectively address these threats because their viability 'as independent nation states hinges on the capacity of their lagoon and coastal fisheries to ensure food security and livelihoods' (Hanich 2018:281).

Security of people

Traditionally, Pacific islanders enjoyed food security resulting from the range of food sources available including subsistence farming, barter, selling, fishing and hunting.

This arrangement has been eroded and replaced by commercialisation, urbanisation and the reliance on cheap and poor quality imported foods (Connell and Lowitt 2019). The importance of coastal fisheries and the health of ocean ecosystems are critical to the cultural, social and economic wellbeing of Pacific peoples, especially during times of crisis.

Growing human populations, along with changes in lifestyle associated with modernisation and global trade, have put enormous pressure on coastal fisheries (Beyerl et al. 2018). In addition, increasing demand for food and higher living standards require higher and regular income to pay for water, power and sewerage facilities, modern houses, roads and a wide range of consumer goods. Land clearing and urbanisation are associated with declines in water quality and the health of coral reefs and associated habitats (Dutra et al. in press).

Safety is a concern because people are venturing further into the ocean in the hope of making a better catch. In one such case, two Kiribati fishermen survived almost four weeks drifting in the Pacific Ocean in 2013 (Australian News Network 2013). The men, aged 20 and 40, were on a fishing trip off Banaba Island in the Gilbert Islands when strong winds pushed their 14-foot boat towards the Solomon Islands. They were rescued by a US ship passing through the area after surviving on raw fish and rainwater, before they were found, more than 675 kilometres away from home.

Food security

Food security is a glaring challenge because increasing population, commercialisation and the need for increased income has forced people to sell their best food sources for cash. In addition, the desire to take up paid employment has taken people out of their villages and into areas where they are unlikely to afford the healthy and nutritious food they used to source from their gardens and the sea. Moreover, the promotion of fisheries development projects is increasing the demand for reef fish thus worsening coastal fishing pressure in the region (Cinner and McClanahan 2006).

With more than two thirds of the animal protein consumed in coastal villages coming from fish (Zeller et al. 2015), one can understand why reef overfishing is common throughout the Pacific (Bell et al. 2017). Overfishing reduces the abundance and size of reef fish and also presents negative consequences for reproduction. In locations where herbivorous fish species are targeted, overfishing can accelerate reef bio-erosion and reduce fish biodiversity and productivity (Doropoulos et al. 2013).

Ecological security

Climate change affects the interactions between the ocean, land and the atmosphere, which influences the health and productivity of the biosphere, society and economy. Increasing ocean acidity and rising sea levels are damaging marine ecosystems including coral reefs, seagrass beds and mangroves that sustain healthy marine environments and coastal fisheries (Dutra et al. in press).

Increased and unregulated use of pesticides and chemical fertilisers, land clearing, changes in land use and infrastructure development, which can lead to increased sediment and nutrient runoffs into coastal waters have degraded coral reefs and affected the fisheries. Forest conversion, logging and mining threaten biodiversity and worsen climate change impacts, which affect unique habitats such as mangroves and coastal systems critical for healthy fisheries. Imagine the ongoing devastation caused by the sediment load from the Rewa River floods that brings approximately 107 tonnes per year to its estuaries and beyond (Hasan 1986). Serious sewage contamination has been reported for many years in the main urban and development centers such as Pohnpei, Federated States of Micronesia (Morrison 1999), Fanga'uta Lagoon, Tonga (Zann 1994), Coral Coast and Suva Lagoon, Fiji (Naidu et al. 1991; Naidu et al. 2018).

Collapsed fisheries across the Pacific highlight the need to align fisheries development to the capacities of the fish stocks. Although deteriorating coastal fisheries have been reported for at least 30 years (Kailola 1995; Pita 1996), lack of data and the multiple types of species being fished have made management complicated as fishers quickly move to a new commodity after noticing depletion in the stocks they are harvesting. Resource management and the rehabilitation of fisheries resources must engage local stakeholders to be effective.

The sustainability of fisheries is also threatened by the pursuit of conflicting government development objectives, poor planning, inaccessible markets, lack of attention to environment management, lack of understanding of the complex social and cultural conditions, insufficient human resources and a lack of evaluation. Fish production has increased considerably in recent decades, threatening the health of the fisheries stock. Improved post-harvest processing and collection of products from rural areas for sale in urban and overseas markets has greatly enhanced the commercial use of fisheries in areas far from the main centres, making fisheries management difficult. The correct balance between resource use and management needs to be strictly adhered to.

Territorial security

Pacific states have declared extensive maritime zones that need to be effectively managed and controlled. While Pacific SIDS were transformed by the 1982 United Nations Convention on the Law of the Sea into large ocean island states with new wealth and potential resources, they were required to fulfill their obligations under the convention. Pacific countries have formed regional institutions such as the Pacific Islands Forum, Forum Fisheries Agency (FFA), and the Secretariat of the Pacific Community (SPC) to support their members in the pursuit of their rights and the delivery of their responsibilities.

Illegal, unreported and unregulated (IUU) fishing is the biggest security threat to the sustainable management of coastal fisheries. IUU is rampant at local and international levels. Recently, Vietnamese fishermen moved into the

western Pacific islands in search of reef resources such as sea cucumber, giant clams, trochus, lobster and fish (Marango 2017). The 'blue boats' are undetectable at sea but have been caught in several Pacific island countries including Palau, the Federated States of Micronesia, PNG, Solomon Islands, Vanuatu and New Caledonia (Radio NZ 2017). In Solomon Islands, 40 blue boats crews were each fined US$99 (A$128) while the boat owners were fined US$1.59m (A$2.06m) (Loopsamoa 2017) for illegally entering the country.

Fisheries development is often undertaken haphazardly without proper stock assessment, feasibility studies or impact assessments. In addition, there is limited appreciation of the relationships between offshore resources, coral reefs and mangrove forests, resulting in poor decision-making that threatens the sustainability of these resources. Links between islands and continental slopes and food webs for tuna occur via the planktonic/larval phase of coral reef fish and via micronekton, while post-larvae from populations of coral reef fish and invertebrates have been found in the stomach of tuna (Le Borgne et al. 2011:212).

Transhipment involves the quick transfer of fish from the fishing ground to the market. It is a vital part of the commercial fishing industry, involving hundreds of refrigerated carrier ships roaming the oceans taking in catch from thousands of fishing vessels and transporting it for processing on shore (Pew Trust 2019). Transhipments can take place at sea or in specified ports where 'unscrupulous fishing vessel operators can obscure, manipulate, or otherwise falsify data on their fishing practices, the species or amounts caught or transferred, and catch locations' (ibid.). Proper control of transhipment is critical to improving the 'health of diminishing fish stocks' and safeguarding the proceeds to host nations. In the western and central Pacific Ocean, over US$142m (A$184m) worth of IUU product is transhipped each year and is misreported or unreported by licensed fishing vessels. These activities harm the livelihoods of those who fish legally, undermine fisheries conservation and management and contribute to global overfishing and the trafficking of people, drugs and weapons.

Security of offshore fish stocks

Pacific nations are obligated to sustainably manage fisheries resources in their maritime areas, even though they do not have the capacity or the resources to exert effective control over their maritime areas, which are undetermined in some cases. Pacific SIDS must meet their international obligations as sovereign governments committed to playing their role to minimize IUU activities.

IUU activities undermine the capacity of the Pacific SIDS to manage and conserve their tuna resources (World Bank 1996). Although Pacific SIDS have formulated innovative regional and subregional fisheries management institutions to protect their resources, these must be effectively implemented and enforced. The FFA advises its members on tuna fisheries management and development issues and has successfully negotiated their regional fisheries management organisation, the Western and Central Pacific Fisheries Commission (WCPFC), to collaborate with their distant water fishing nation partners in the sustainable use of the region's fisheries resources.

The lack of capacity in Pacific SIDS to enforce compliance or exemptions, as well as the incompatibility of national, subregional and regional objectives weakens regional management arrangements and compromises the equitable sharing of benefits from the use of fisheries resources. These factors threaten the sustainable management and development of fisheries resources in the Pacific islands, which puts at risk those dependent on them.

Deep seabed mining is also a major concern given the negative impact on the ocean of any disturbance of the ocean floor. Unfortunately, Pacific SIDS regard the mining of deep seabed minerals as a welcomed opportunity for economic diversification and growth and have based their marine space claims over it (Giron 2016). PNG has been working with Nautilus Minerals for the development of hydrothermal sulphides in its economic exclusion zone. It is essential that Pacific SIDS implement a carefully planned strategy of maritime power, 'which assumes a strong assertion of maritime sovereignty' (Giron 2016:95).

Some Pacific SIDS may be disregarding the sustainability of their resources to ensure the attainment of short-term development goals. Hau'ofa (2008:48) reminded us of the risk as our countries and people scramble to carve a future in:

> an age when our societies are preoccupied with the pursuit of material wealth, when the rampant market economy brings out unquenchable greed and amorality in us.

This is illustrated by fisheries developments that are pursued without proper consideration of the fish stocks, increasing numbers of highly efficient fishers, reactionary rather than properly planned resource management, ineffective management measures and coastal states paying lip service to sustainable fisheries development.

The way forward

Secure access to productive fish stocks is fundamental to sustaining Pacific livelihoods, economies and wellbeing. Sustaining our coastal fisheries resources is our ultimate goal and challenge given the multiple species that must be managed in a healthy environment, the dependence of people on coastal resources for food, the growing demand associated with higher populations, and the increasing commercial use of the resources and the enormous areas that have to be managed. Although sustainable fisheries are included in the region's strategic frameworks, these frameworks have to be effectively aligned and implemented. Pacific SIDS must formulate, implement and enforce appropriate fisheries development policies, strategies and activities.

The management of known endangered keystone species such as sharks, turtles (Sabinot and Bernard 2016), Maori wrasse, rock cod, coral trout, giant clams and *beche de mer* should be a part of an integrated development and management plan for coastal fisheries. Finding a solution for such overexploited resources will not be easy but must start with the education and empowerment of all our people on the changes that need to be undertaken (Aqorau 2014). As we have witnessed with the community-based management of marine resources, major accomplishments are made when all of our people are empowered and supported to play active roles in the management of resources many of them own.

Palau is leading the fight to have vibrant and healthy coral reefs as the basis of sustainable development that supports strong and robust economies. Working under the Micronesia Challenge with the Commonwealth of Northern Mariana Islands, the Federated States of Micronesia, Guam and the Marshall Islands, Palau pledged to protect 30 per cent of its coral reefs and 20 per cent of its forest resources by 2020, as well as contribute to the global coral reef conservation targets (Micronesian Challenge 2020). These countries have heightened marine resource management, and solicited much needed funds and technological assistance from international partners to support local initiatives and advocate the importance of taking appropriate action at all levels of governance.

Regional cooperation is the logical approach to address shared issues such as minimising IUU fishing and resource depletion and promoting environmental management, community-based fisheries management and the use of innovative new methods such as aerial surveillance and digital data collection and analysis in support of evidence based decision-making and formulating appropriate management responses. However, effective regional management arrangements will only be accomplished through enhanced regional integration, which will be compromised if:

> individual states pursue different objectives based on their own interest, because the success of regional resource management arrang ements depends on the resemblance of objectives of member states and the compatibility of regional and national policies and strategies (Aqorau 2014).

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