

# An overview of fishing in Wallis and Futuna: Prospects for the sustainable management of coastal marine resources

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## Abstract

Participatory management of coastal resources is the method preferred by Pacific Island countries and territories to both ensure a degree of food security and act against overfishing. Wallis and Futuna islands offer a number of similarities with other islands in the Pacific: they have been able to maintain their culture and a traditional system, both still very relevant features co-existing with Western values, in this case, those of the French Republic. Contrary, however, to other regional island countries and territories, the population of Wallis and Futuna is gradually shrinking. This trend can be considered beneficial for their marine resources, which for a long time were under severe pressure. The limited number of scientific studies carried out in Wallis and Futuna have, nevertheless, highlighted the vulnerability of some of these resources, without being able to confirm whether or not they are being sustainably harvested. The fact remains that some fishers report a decline in coastal resources, without necessarily perceiving this as an issue. This would seem to be the consequence of a relative lack of knowledge and awareness around the vulnerability of coastal resources, and of some acceptance that the marine environment could be damaged by persistent unsustainable practices.

There is very little documentation describing any traditional coastal resource management methods in Wallis and Futuna, with the initial arrival of missionaries and then the westernisation of society seeming to have changed the bond that Wallis and Futuna islanders had with the ocean. Although today fishing still plays a major part in the life of the people of both islands, coastal resource management is not seen as a priority by the majority of the surveyed population. Existing regulations on fishing activity are either not understood or fishers have never seen them, and they are not accepted by the community. Unsustainable fishing practices continue without being challenged. On the basis of these factors, the current context in Wallis and Futuna is not the most favourable for introducing a participatory management process. This article sets out some of the preconditions that could favour the emergence of the awareness required to introduce sustainable coastal resource management practices.

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## Introduction

Coastal fisheries play a vital role in food security and subsistence in Pacific Island countries (Gillett 2016; Johnson et al. 2017). Overfishing, global warming, habitat destruction and ocean pollution are all threats to coastal resources (Bell et al. 2012). The regional forecasting is increasingly worrying with regards to the future of coastal fisheries and their ability to feed Pacific Island communities, unless there is a significant improvement in the management and status of these resources and their habitats (Bell et al. 2009; Gillett and Cartwright 2010; Bell et al. 2012; Johnson et al. 2017; Asch et al. 2018).

An assured sustainable supply of coastal marine resources is a priority for Pacific Island governments, as expressed in a series of regional political declarations, with special reference to the Regional Roadmap for Sustainable Pacific Fisheries (FFA and SPC 2015) and the New Song for Coastal Fisheries (SPC 2015). Community fishery management is one of the preferred management methods for achieving this sustainable fishery goal.

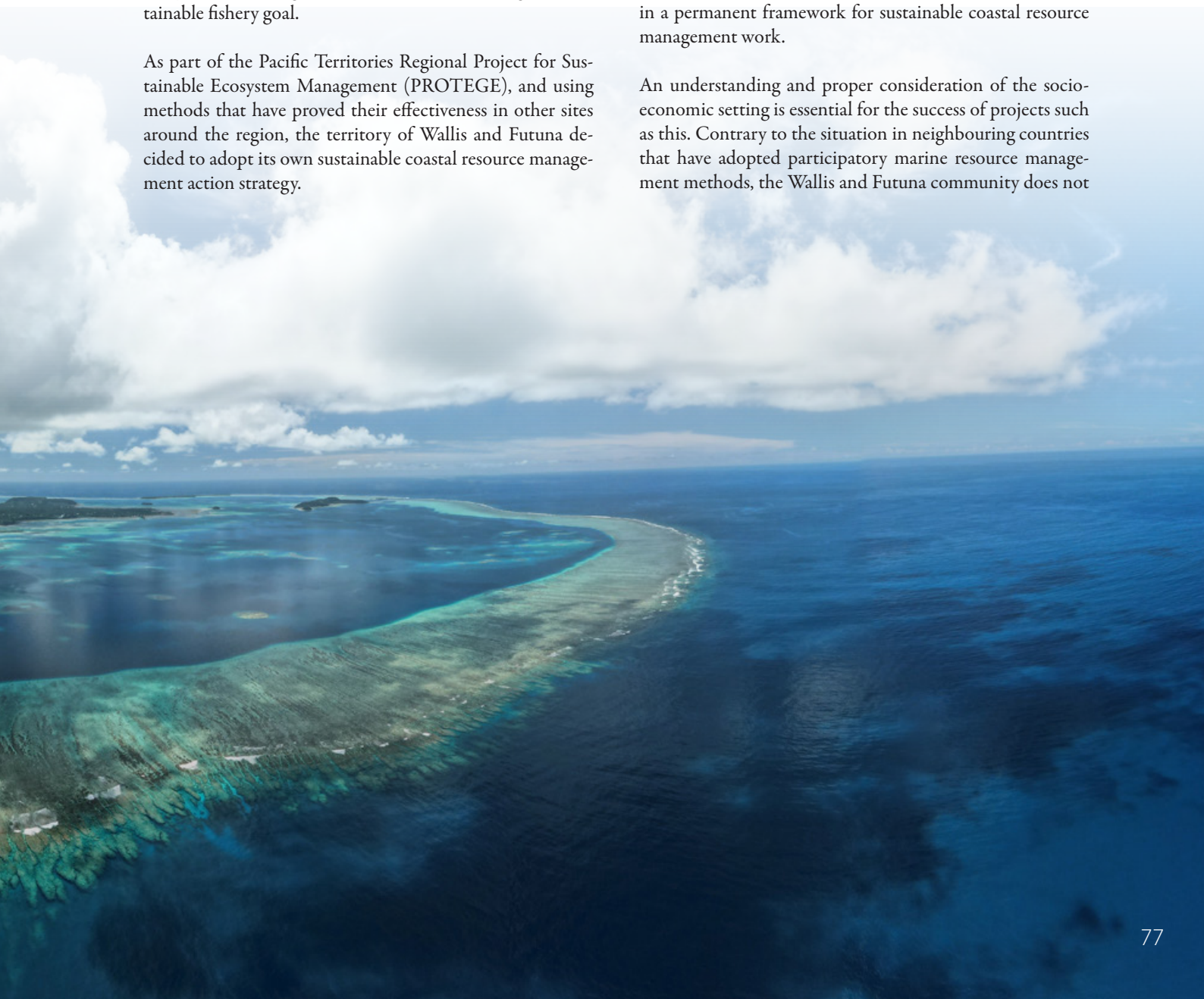
As part of the Pacific Territories Regional Project for Sustainable Ecosystem Management (PROTEGE), and using methods that have proved their effectiveness in other sites around the region, the territory of Wallis and Futuna decided to adopt its own sustainable coastal resource management action strategy.

In Wallis and Futuna, coastal fishing plays a big part in the daily life of the community, which fishes for subsistence and economic reasons (commercial fishing), and for recreation. In the same way as with agriculture, fishing helps to maintain a socioeconomic balance in the islands. The territory's dependency on coastal marine resources makes the way they are managed a major issue.

Compliance, however, is low even with the few resource management measures that do exist. Unsustainable practices could ultimately compromise the sustainability of these islands' marine resources, the relevant balances and also socioecosystem resilience.

In 2007, the Coral Reef Initiative for the South Pacific (CRISP) outlined a "marine space management plan" (PGEM) for Wallis and Futuna (Egretaud et al. 2007a, 2007b; Verducci and Juncker 2007). Subsequently, some one-off integrated coastal zone management activities were introduced (Moncelon 2017a, 2017b; INTEGRE 2018). These actions did not, however, make it possible to bring in a permanent framework for sustainable coastal resource management work.

An understanding and proper consideration of the socioeconomic setting is essential for the success of projects such as this. Contrary to the situation in neighbouring countries that have adopted participatory marine resource management methods, the Wallis and Futuna community does not



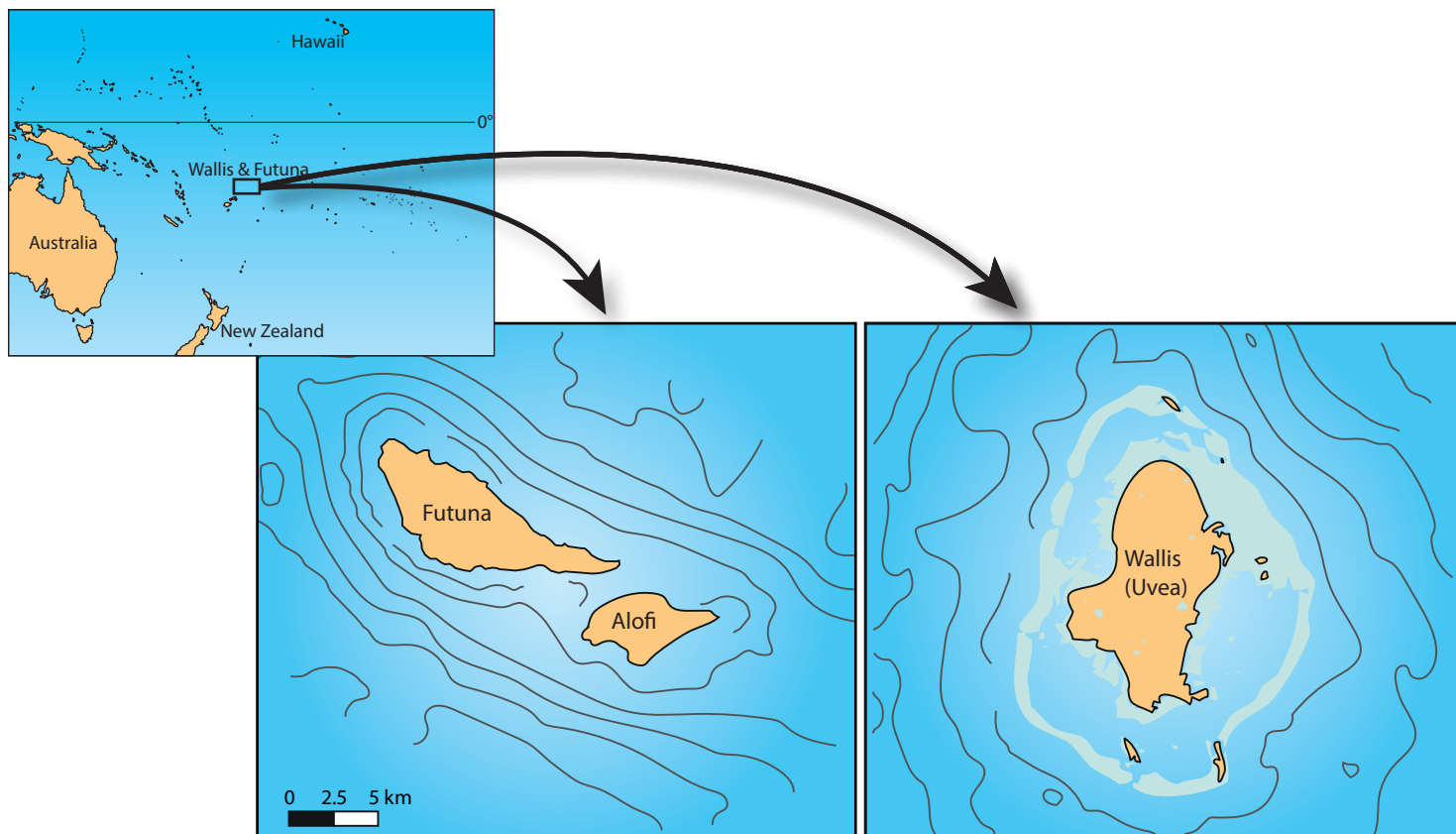


Figure 1. The islands of Futuna and Alofi are situated 230 km southwest of the island of Wallis.

seem to be particularly concerned when faced with a decline in some species and does not see coastal resource management as a priority. This particular contextual component means that it becomes very difficult to involve stakeholders in the introduction and monitoring of management measures (Aubert et al. 2020).

How favourable then is the Wallis and Futuna context for good marine resource management? Are marine resource use and fishing practices sustainable? Were they ever? What is the status of resources and how are they perceived by the community? What are the prerequisites for introducing participatory and sustainable coastal resource management in Wallis and Futuna? What are the conditions required to implement management activities?

## Methodology

The information and data assessed for the purposes of this article come from a compilation of 34 studies carried out in these islands, interviews by the Fisheries Department with fishers, stakeholders and decision-makers (traditional leaders, Territorial Assembly members, representatives of the French Higher Administration), and focus group activities among stakeholders.

The Fisheries Department received support from the Fisheries, Aquaculture and Marine Ecosystems Division of the Pacific Community (SPC), the PROTEGE project, and the companies Trajectoires and HOPE ! in performing this situational assessment (Aubert et al. 2021).

## A general introduction to the Wallis and Futuna context

### Geography

- Wallis and Futuna lies 450 km northeast of Fiji, 345 km west of Samoa, 450 km north of Tonga, 600 km south-east of Tuvalu, and 670 km southwest of Tokelau, thus occupying a central position in western Polynesia (Fig.1).
- The territory comprises three main islands, Wallis, and Futuna and Alofi (the latter two are also known as the Horn Islands).
- Volcanic Wallis Island, 78 km<sup>2</sup> in area, is the biggest in the group. It is a low island, whose highest point reaches an elevation of 151 m. It is surrounded by a lagoon approximately 63 km long and 4 km wide, delineated by a barrier reef with four passages (Richard et al. 1982; Juncker 2005).
- Some 230 km southwest of Wallis, are the islands of Futuna and Alofi, which are both mountainous islands with rugged coastlines and difficult access to the sea. The highest points are Mount Puke on Futuna (524 m) and Mount Kolofau on Alofi (417 m). Futuna (46.3 km<sup>2</sup>) has no lagoon but does have rugged relief. Its small, neighbouring island of Alofi (17.8 km<sup>2</sup>) is uninhabited and separated from Futuna by a strait 1.8 km in width (Richard et al. 1982; Juncker 2005).

These distinct geographical settings have produced very different fishery practices.



### *Demography*

Between 1969 and 2003, influenced by a high birth rate and relatively low emigration, the population increased by 75%, from 8546 to 14,944 inhabitants. Since 2003, this trend has reversed, with both increasingly high levels of emigration and fewer births. Consequently, the territory lost more than 22% of its population between 2003 and 2018, reverting to its pre-1983 level (INSEE 2019).

In 2018, the population of Wallis and Futuna was 11,558, two-thirds of whom lived on Wallis and one-third on Futuna (INSEE 2019).

This decline inevitably has led to a reduction in fishing pressure, which was a very welcome reversal for the resource, but which has also contributed to a loss of traditional knowledge of fishing.

### *Cohabitation of a traditional and administered economy*

The only data accessible on the subsistence economy date back to 2005–2006: households at that time produced, on average, for their own consumption goods with a monetary value of EUR 530<sup>3</sup> per month. Subsistence consumption, therefore, represented a significant proportion of total household expenditure (26%) (Buffière et al. 2006).

The “formal” economy is highly regulated. Almost 56% of the total value of salaries comes from government jobs (IEOM 2020). The territory is additionally highly dependent on the outside world for other food products and fuel for energy. In contrast, exports are virtually non-existent.

In 2005, the gross domestic product per inhabitant was approximately EUR 10,117 per annum, placing the island group in a leading position among Pacific Island states and territories in terms of standard of living.

From our assessment we have found that the comfort of an administered economy and a context of acceptance of external dependency are not favourable to increased awareness regarding marine resource vulnerability.

### *Institutional organisation*

While the islands of Wallis and Futuna share a common history and culture with other Polynesian islands, their status as a French territory since 1961 (after being a French protectorate since 1888) has resulted in a unique development history.

The islands have been able to maintain their royalty systems, which distinguishes them from the other French Pacific territories of French Polynesia and New Caledonia. Responsi-

<sup>3</sup> The local currency in Wallis and Futuna is the French Pacific franc (XPF). EUR 1.00 = XPF 119.33.

Gleaning is mostly done by women in Wallis and Futuna. Image: © Baptiste Jaugeon



bilities are shared between the representative of the French state, known as the Prefect, traditional authorities and the Territorial Assembly, which is the territory's deliberating chamber. The hybrid status of Wallis and Futuna is based on a balance between French state law and the recognition of the customary authorities' legitimacy, to which should be added the strong influence of the Catholic Church.

Community organisation is still a very strong factor when it comes to traditional customary and religious events but is losing traction in its influence on daily life. In the same way as in modern societies, individualism is also gaining ground in Wallis and Futuna (van der Grijp 2002) and relates the answer to indigenous representations of work and to cultural constraints on leadership. It should be noted that the customary system on Wallis has been in crisis since 2005, with two chiefly houses claiming and sharing the same territory. These periods of instability are apparently fairly common in the Pacific (Blanchet et al. 2001). The coexistence of two sources of traditional authority on the same territory is a hindrance to management and development projects, and especially the implementation of a fishery management strategy.

### *Fishery managers*

Traditional fisheries management long involved organising collective fishing activities as part of celebrations or customary exchange practices. It involved managing fishing

practices by regulating access to certain zones or by setting a fishing ban (tapu) at certain times of the year on some fish species or certain techniques (Burrows 1936; Gaillot 1961; Rozier 1963; Blanchet et al. 2001). Today, apparently, there are no more iconic marine species or tapu areas (apart from the places where fishers have perished at sea). The ocean is a free space where any form of regulation seems to be seen as a deprivation of rights.

Administratively speaking, fishing is under the authority of the Fisheries Service within the Agriculture, Forestry and Fisheries Department of Wallis and Futuna. The department's job is to support fishing activities and improve the population's living standards by making access to the resource easier through the acquisition of new techniques. Its job is also to implement a sustainable fishery development policy. The Wallis and Futuna Fisheries Service is trying to support fishers to become more professional, and it is the guarantor of the status of professional fishers: licensed fishers can obtain fuel subsidies if they hand in their fishing logs; they can also claim investment support.

Fishing activities began to be regulated in Wallis and Futuna's territorial waters (<12 nm from land) by the territorial government from 1994 onwards. A number of orders were adopted to ban fishing practices such as using explosives, crowbars and poison, and night spearfishing and fishing with scuba gear. The use of nets is also regulated, with minimum catch sizes for species such as lobster, coconut crab and trochus being introduced. From 2005, these regulations were supplemented through a resolution to modernise the regulations governing the status of professional fishers. The resolution contains provisions regarding the protection of endangered species (cetaceans and sea turtles), as well as setting limits on catches and outlawing sales by non-professionals. In addition, in 2020, the territorial Environment Department secured the adoption of a list of protected species, banning the capture of turtles, humphead wrasses and some invertebrate species (e.g. sea cucumbers and giant tritons).

While such regulations can be seen as a vital tool in marine resource management, in reality they are not applied. There are no checks and there have never been any administrative penalties. Some professional fishers are familiar with the regulations, but this is not the case for most fisherfolk or the community at large. In addition, some bans such as those on underwater spearfishing at night and catching humphead wrasses and marine turtles, are rejected by most fishers, including professionals.

There is also the issue of monitoring, control and surveillance of fishing activities. In the opinion of traditional leaders and elected representatives, the enforcement of regulations must be done in cooperation with the customary chiefs, who would need to support it. Operationally speak-

"Without fishing there is no way to live" Soane Katoa, day and night underwater fisher, Futuna. Image: ©Baptiste Jaugeon





ing, different views prevail: some people think this is a job for the gendarmerie, while others believe it should be in the hands of the chiefs. At the present time, the regulations and the territory's status do not make it possible to introduce "community" management because they do not enable the empowerment of local communities. The territorial management agencies are favourable to this transition so that the traditional leadership can be included in the arrangements and communities can be given responsibilities.

### *Who does the ocean belong to?*

Management of the maritime space raises a governance issue. The management of territorial waters (<12 nm from land) is the responsibility of the Territorial Assembly. Management of the exclusive economic zone (12–200 nm from land) comes under the responsibility of the French government. In customary terms, the maritime domain is not territorialised, and its use is available to everyone for free.

In a future sustainable coastal resource management project, these governance contradictions could generate conflicts over legitimacy in terms of surveillance and management measure enforcement.

### *Profile of fishing and fishers*

Fishing in Wallis and Futuna is an exclusively coastal activity, with almost all fishing effort focused on an area from the fringing reef to a few nautical miles offshore

Fishers generally do not use mechanised fishing gear. Most boats are small (4–6 m in length) and have outboard motors of between 15 and 80 hp. Very few fishers own a global positioning device or echo-sounder, and safety equipment is often lacking. Most people net fish (50%), underwater spearfish (44%), troll (21%) or handline (26%). Some 35% of fishers also collect shellfish and crustaceans. Taking all the techniques together, fishers tend to go out once or twice a

week for periods varying from two to eight hours, and targeting a very broad range of species. Professional fishers target more than 300 species of fish and invertebrates (Wallis Island is free from ciguatera), and about 30% of these catches consist of tunas and associated species.

At the last general agricultural census in 2014, 29% of households on Wallis (395) and 40% on Futuna (263) stated that they actively fished; thus, there are 2632 fishers, 736 on Futuna and 1896 on Wallis, and a total of 81 boats used in fishing activities.

Annual production was estimated at 825 tonnes, with 150 tonnes for sale and 675 tonnes for home consumption. Local fish consumption per inhabitant was subsequently estimated at 68.7 kg/year (Sourd and Mailagi 2015).

Fish landings are mostly intended for family consumption and customary exchanges, with sales being quite limited (27% of fishers state that they sell their catches from time to time). A small proportion of fishers attempt to generate significant income from their activity but generally speaking have no management knowledge (regarding depreciation in particular), their equipment is often badly maintained, and their fishing trips are conducted on an irregular basis, generally determined by immediate financial needs. Only a limited number of fishers, holding licences issued by the Fisheries Service, can be truly considered as professionals.

Catches are mainly sold when the boats return from trips or in commercial outlets, at between EUR 7.50 and EUR 12.50/kg.

While there can be no doubt that fishing still plays an important part in the culture and life of the people of Wallis and Futuna, and while seafood consumption remains high, the community's dependency on marine resources remains a relative one. Few households report fishing as their main source of income (Buffière 2006). For example, in the two

Mikaele Moleana, experienced net fisherman, Mua, Wallis.  
Image: ©Baptiste Jaugeon



Ark clams (*Anadara* sp.) collected from Wallis lagoon.  
Image: © Baptiste Jaugeon



villages considered to be fishing villages 15 years ago, only 38% of the households in Halalo and 19% in Vailala drew their main income from fishing (Kronen et al. 2006). To this background, interest in the state of marine resources does not emerge as a major factor.

### *Unsustainable fishing practices and other pressures on marine resources*

Fishing effort may appear to be relatively low with the decline in the population and the number of fishers, but some unsustainable fishing practices still prevail.

- Underwater spearfishing is carried out both at night and in the daytime. At night, spearfishers tend to target sleeping surgeonfish and parrotfish.
- Another technique used by fishers in Wallis and Futuna is the drift net. Not many use this method, but it can lead to dramatic consequences when the nets are set to catch fish migrating towards a spawning ground. Some fishers report catching more than 200 kg of mullet in their nets.
- Fishers mainly target spawning periods and sites. Some species such as groupers, emperorfish and surgeonfish congregate in reef passages during breeding seasons around a full moon or new moon.

*'Alu 'alu i mala tau ki monu. Persevere, the fish will eventually bite.*  
Image : © Leone Vaitanoa, Wallis



- Fishers are not very selective, either with species or catch sizes. This may be advantageous in terms of fishing activity because the fishing pressure is spread over a large number of resources, but catches of juveniles and very large specimens can also affect stock reproduction potential.
- Fishing on foot, repeated trampling of the reef, and random anchorage choices may lead to serious damage to reef and lagoon habitats.

To this should be added other current pressures: massive terrigenous deposits from landslides; domestic pollution sources, including pig effluent, sand and coral extraction; land reclamation; and coastline and lagoon current changes. These sources of damage have been observed qualitatively in the field (Gabri  1995; Verducci and Juncker 2007; Chancerelle 2008).

The impact of these pressures remains difficult to fully assess, particularly in the coastal zone along seagrass beds and mangroves, which are essential habitats in the life cycle of many marine species. The threat of climate change also increases the vulnerability of these resources and their habitats.

## **The state of Wallis and Futuna's marine resources**

### *Perception of the state of various resources*

The main hindrance to implementing participatory and sustainable coastal resource management appears to reside in the lack of social demand. This topic, however, is not perceived as a priority.

In 1969, underwater spearfishers had already been reporting that the number of large groupers, parrotfish and humphead wrasses had diminished considerably. Spearfishers readily admitted that this was due to the increasing number of spearguns sold and to the poor practice of going out underwater spearfishing at night using waterproof electric torches (Hinds 1969).

In 2007, as part of the projected marine space management plan, the majority of people surveyed testified to a decline in resources (Egretaud et al. 2007a; Verducci and Juncker 2007).

In 2018, 2019, 2020 and 2021, surveys conducted with some 50 professional and subsistence fishers revealed differing opinions about the state of resources.

On Wallis, a number of professional fishers expressed a clear perception that lagoon resources were shrinking. This decline required fishers to dive to greater depths (more than 20 m) and spend more time at sea to bring home the same quantity



of seafood. They implicated unsustainable practices, especially underwater spearfishing at night, or nets left in the sea for too long or of excessive length. Other fishers had a completely different perception, claiming that there is still enough fish to meet people's needs. They also queried the destructive nature of underwater spearfishing at night. Female fishers consulted on Wallis perceived a reduction in fish and ark clams (*Anadara* sp.) in the lagoon. The reasons given included night-time underwater spearfishing, beach width shrinkage and uncontrolled garbage dumping (Aubert et al. 2020).

On Futuna, some fishers reported declines in recent years of unicorn fish (*Naso unicornis*) and green jobfish (*Aprion virescens*). There are also fewer large giant clams and fishers now have to go farther offshore to find them. Other fishers felt there has been no significant change over their lifetime. Female fishers on Futuna did not, as a whole, perceive there to be a problem with a decline in resources on the reef that they exploited. After specific questioning, however, they produced a list of everything that had disappeared or virtually disappeared (e.g. green snail, trochus, giant clam, octopus, sea cucumber and mussel) (Aubert et al. 2020).

There does not seem to be any dominant discourse within the fishing community surveyed, including both men and women, regarding the perception of the state of local re-

sources varying from person to person. Some fishers do report a decline in catches and the size of fish and some invertebrates, which they say are harder to find than in the past. This observation is, however, only infrequently seen as a problem and often comes with a degree of fatalism not requiring any action to be taken. For most of the stakeholders surveyed, there is no cause-and-effect relationship between fishing practices and a possible decline in coastal resources. External factors, such as climate warming and foreign fishing vessels, are often referred to, and the vast majority of people interviewed are quite sure that when challenges such as this arise, providence will always save them.

This fatalism has already been referred to in Wallis and Futuna to describe local community perceptions of natural hazards (Dupon 1984). In similar settings, some authors state that, until such time as communities adopt a more deterministic approach, establishing the cause-and-effect relationship between human action and resource abundance trends, no management initiative will be possible (Foale 2006; McClanahan 2007, 2010; Bruggemann et al. 2012). Improved monitoring and inclusive communication on the relationship between the various pressures and resource abundance trends could, therefore, be an initial source of leverage towards achieving participatory and sustainable coastal resource management in Wallis and Futuna.

Tilita, fisherwoman of Wallis.  
"They call me Mrs. Share. I often glean on the flats  
and I always give away part of my catch because I  
know that God will pay me back."  
Image: © Baptiste Jaugeon





### *What was and what is the status of the resource?*

Before World War II, Wallisian and Futunan society was still very traditional. The first descriptions of fishing practices go back to the writings of the first missionaries, and in 1932, fishing techniques were still very limited (Burrows 1936, 1937).

Wallis and Futuna island society was deeply disrupted in 1942 by the arrival of the American army, the emergence of a market economy, and the abandoning of subsistence cropping in order to provide food for the American military. The presence of 4000 men required the population to mobilise en masse to support the troops. The euphoria was only short lived, with American soldiers leaving behind a collapsed traditional economy when they departed in 1944. The lagoon suffered particularly badly in terms of its fish and crustacean resources through inappropriate fishing methods, especially dynamite fishing (Angleviel 2006).

In 1969, an SPC expert, reported stock shrinkages because of the persistent use of destructive fishing methods, the lack of interest in fishing as a profession, and difficulties in supplying the local market (Hinds 1969).

The first comprehensive inventories, quantified scientific data production activities and ecological studies on the islands' marine environment began in the 1980s.

The first inventory of the underwater fauna and flora of Wallis and Futuna was carried out in 1980 (Richard et al. 1982). This study recorded 330 species of fish in more than 55 families in the lagoons of Wallis, Futuna and Alofi.

Over 20 years later, a new expert study yielded the first quantitative data (density and biomass) and structural information about the reef ichthyofauna of Wallis (Wantiez and Chauvet 2003). Only 194 species of fish (30 families) could be recorded. A spatially less extensive sampling campaign (Richard et al. 1982) could, however, explain the lack of some fish species that were previously recorded. It is also possible that recruitment variations may explain these discrepancies in abundance.

The following year, a major sampling effort made it possible to obtain a relatively comprehensive snapshot of the fish communities (648 recorded species belonging to 79 families) (Williams et al. 2006), and confirmed the existence of major spatial and temporal variations in juvenile and adult populations (Wantiez 2000a, 2000b, 2001a, 2001b) that could possibly be attributed to the unreliable supply of fish larvae to Wallis lagoon (Juncker 2005). At the same time, a reef health status monitoring exercise was carried out by the Island Research Centre and Environmental Observatory. From the results of the first three monitoring programmes (1999, 2002 and 2005), it emerged that the reefs and outer slopes investigated were not showing clear damage (Chancerelle 2008).

The research conducted by Richard et al. (1982), Juncker (2005), Williams et al. (2006) and Chancerelle (2008) was not designed as a report on the status of marine resource stocks but rather to describe the ecology and dynamics of these populations.

A fishery-oriented approach was adopted in 2005–2006 by SPC as part of the regional oceanic and coastal fisheries development programme, PROCFish/C. Surveys and underwater visual census campaigns aimed at collecting reference information on the state of reef fisheries in order to contribute to overcoming the enormous information deficit – an obstacle to good management for these fisheries (Kronen et al. 2006).

Subsequently, reef and lagoon resources have not been subject to investigation, with the exception of commercial invertebrates such as sea cucumbers (Chauvet and Lemouellie 2005; Chauvet et al. 2011; Bertram et al. 2015), spiny lobster and slipper lobster (Bosserele et al. 2018a), coconut crab (Bosserele et al. 2018b) and trochus (Chauvet et al. 2004, 2006; Bosserele and Liufau 2017).

Very recently, an even more thorough inventory was performed by the Institut de Recherche pour le Développement (Institute of Research for Development) as part of the regional strategic analysis performed by the Office Français de la Biodiversité (French Biodiversity Agency).

These many studies pursued a range of objectives, although common elements emerge. There can be no doubt that, in the past, the reef and lagoon resources have been jeopardised, but they seem overall to have been in a good state when the research was performed. Some warning signs were, however, also observed: different variables (abundance, biomass, species size) point to selective and impact-producing fishing pressure, with special reference to the most accessible coastal and intermediate reef formations.

### *Can we fish more?*

When investigating the reef and lagoon resources of Wallis and Futuna, it is important to bear in mind the relative geographical isolation of these islands. Apart from some shallows in the exclusive economic zone, these islands tend to rely on recruitment from their own reefs (Juncker 2005). This isolated status of Wallis and Futuna is thought to hinder access to marine organisms from other reefs. In the event of local overfishing, recolonisation and stock rehabilitation would be a long process, even more so if the habitat has been damaged by poor practices (Blanchet 2001).

Research carried out in 2009 (Bell et al. 2009) categorised Wallis and Futuna as one of the Pacific Island countries and territories for which reef and lagoon fishing could not sustainably supply fish in quantities sufficient to meet community demand. On the assumption that one square metre of reef cannot sustainably supply more than 3 tonnes of fish per

year (Newton et al. 2007) structure, function, and resilience 1, 2. Although it is generally held that coral reef fisheries are unsustainable 3, 4, 5, little is known of the overall scale of exploitation or which reefs are overfished [6]. Here, on the basis of ecological footprints and a review of exploitation status 7, 8, we report widespread unsustainability of island coral reef fisheries. Over half (55%, the authors estimated – from the available spatial assessment data – that the reefs of Wallis and Futuna (including shallows) would not be able to sustainably supply more than 800 tonnes annually.

In 2006, however, fishery production (including tunas) was estimated at 900 tonnes and then at 825 tonnes in 2014. The reefs of Wallis and Futuna were therefore exploited to an extent exceeding their capacity.

Production data from the household budget surveys in 2019 and 2020 are not yet available, but production may have declined because of demographic shrinkage and possibly dropped to a sustainable exploitation level.

These large-scale estimates do not, however, address the impact of certain practices, the exploitation of specific species, habitat destruction or yield drops associated with climate change. There is merit in determining with accuracy the sustainable coastal resource exploitation threshold in Wallis and Futuna.

## Conclusion

### *Is the Wallis and Futuna context conducive to good marine resource management?*

Like agriculture, fishing is an activity that helps maintain a socioeconomic balance in Wallis and Futuna. For many people, the sea is a true larder, “a reserve for hard times” and a guarantee of high-quality, healthy and local food. For others, it means they are certain that they will be able to meet their everyday expenses. And for a number of professional fisherfolks, it is their workspace, enabling them to catch fish and supply the local market.

At present, because of declining demography, a relatively high standard of living, a relative degree of dependency on marine resources, a customary system that is losing influence, and an indulgent government administration, the people of Wallis and Futuna enjoy a great deal of freedom in terms of their marine spaces.

Any management measure is perceived as a loss of freedom and a futile effort in light of nature’s providence, especially as the majority of fishers do not see any cause-and-effect link between their activities and the decline in resources. This leads to a lack of social demand for marine resource management.

The resources of Wallis and Futuna are, however, not infinite and have limited renewal capacities, especially when it is realised that unsustainable practices continue and place increasing pressure on the marine environment.

As observed by a professional Wallis and Futuna fisherman: “To be free does not mean that you give yourself permission to do what you shouldn’t be doing”.

### *What are the prerequisites to the introduction of participatory and sustainable coastal resource management in Wallis and Futuna?*

Today the prerequisite for introducing participatory coastal resource management would be to change the sociocultural paradigms associated with natural resource use. Various avenues are under consideration: raise awareness about the vulnerability of reef and lagoon marine resources, demonstrate the causal links between resource harvesting and stock reduction (and between management and sustainability), and strengthen resource monitoring efforts by making this knowledge available and disseminating it.

The sources of motivation that could induce behavioural change are not always rational. The lack of social demand would appear principally to be part of the cultural and spiritual spheres and, therefore, it could be that the solution would not be to create a contrast between coastal resource management and culture, but rather to reconcile these from a new standpoint.

In a future article, the authors will address the strategy that is beginning to be introduced in order to attempt to achieve participatory marine resource management based on knowledge and awareness within local communities.

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Reef and lagoon fishing do not need to be very selective on Wallis, an island free of ciguatera. Image: © Matthieu Juncker

