Small-Scale Fisheries in New Caledonia: Towards a Fishers' Perspective

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Abstract

Devoting a full chapter to the fishers of New Caledonia serves a dual purpose: firstly, to report on a practice driven by multiple rationales that are, for the most part, unknown or insufficiently understood in and outside the territory, and secondly, to show that the place that fishers occupy in the relationship between fish, ecosystems, fishing effort and consumption is much more complex than in other small-scale fisheries and management regimes. Drawing on anthropological and geographical research conducted since 2010, this chapter sketches a general picture of the main types of fishing practised in New Caledonia, focusing on presenting the fishers who undertake them. We discuss the place of fishing in the livelihood activities of Caledonians, irrespective of their social status, and examine the different purposes for which fishing is practised and that fishers assign to their practices. The conclusion focuses on ongoing efforts at the territorial and provincial levels to better incorporate the fishers' diversity and functions in fisheries management policies.

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5.1 Introduction

5.1.1 Fishing and Fishers

The main ambition of this chapter is to describe the diversity and the complexity of small-scale fishers' behaviours and practices in New Caledonia and to examine in particular the fishers' motivations for undertaking professional and non-professional fishing. Devoting a full chapter in this book to the small-scale fishers of New Caledonia serves a dual purpose: firstly, to report on a range of livelihood practices including commercial and subsistence fishing, marketing and distribution and regulation that are driven by multiple rationales, and secondly, to show that fishers occupy a complex position in the marine ecosystem that extends much more widely than their operations in New Caledonia's territorial waters to include on- and offshore labour relations and commodity chains involving buyers and consumers.

We hypothesise that fisheries management is much more than the management of fishing effort, that is, all the means deployed to extract living marine resources. Fishers and their activities cannot be reduced to catch, number of boats, fishing gear, duration of trips and spatial location. Seeing fishers as the top predator in a fishing ecosystem is also rather limiting, ignoring their other activities and social networks.

Therefore, we need to go beyond the ecosystem service approach, which considers fisheries as an ecosystem supply service. It was applied recently in New Caledonia through the IFRECOR (French Initiative for Coral Reefs) and RESCCUE projects on monetary value services provided by the lagoons (Pascal 2010). A relationship is established

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between the ecosystem that produces the fish resource and the consumers who are beneficiaries of the service.

This approach tends to completely eclipse fishers, who appear to lose their place in the fish/consumer relationship. Yet they are the main actors in this dynamic. Fishing is not only a question of fish mortality management (Brêthes 2000; David 2008). To put fishers at the forefront means to explore the non-biological drivers of fishing effort, including cultural and social drivers and their own views of their role and functions in society.

5.1.2 Fisheries Studies in New Caledonia and Their Fields of Application

As other chapters explain, New Caledonia is a French overseas territory in the Pacific, a *sui generis* territory still engaged in a process of negotiated decolonisation. Its population is diverse, as previous chapters have outlined. Throughout its sometimes violent and painful history, Europeans, Oceanians and Asians have settled in New Caledonia and today live alongside the indigenous Kanak people, who now make up 41.2% of the population according to the last census (ISEE 2020). For both Kanak and non-Kanak people who depend on natural resources for their livelihoods, fishing is an important activity in rural areas alongside horticulture, market gardening, agriculture (Guyard et al. 2014; Bouard et al. 2018) and waged employment, which is mainly in mining services. Fishing is widely distributed and uses a range of fishing gears.

The study of fisheries in New Caledonia falls into two main categories (Fig. 5.1). The first are ethnographies of fishing practices as part of research on a local group or community (Teulières-Preston 1992; Sarasin 2009) or as targeted anthropological studies on fishers (Leblic and Teulières-Preston 1987; Leblic 1989; Leblic 2008; Sabinot and Lacombe 2015). Recent research has focused on firstly changes in recent years in subsistence fishing; secondly its contribution to fishers' livelihood needs, especially in Kanak communities; and thirdly the link to conservation agendas and mining development (Cornier and Leblic 2016; Sabinot and Lacombe 2015; Sabinot and Bernard 2016; Sabinot and Herrenschmidt 2019).

The second group of studies is more oriented towards the economic and geographical extent of fisheries, particularly using survey data (Fig. 5.1). The main focus in the South Province is recreational fishing, including on the UNESCO World Heritage reefs of the Great Southern Lagoon (Jollit 2010; Jollit et al. 2010; see Chap. 2 by Rodary in this book). Two questions are addressed. How can frequenting of fishing grounds be used as a proxy for fishing effort? Also, how can the impacts of recreational fishing be assessed in marine protected areas, by observing catch and carrying out statistical monitoring? Earlier studies dealt with household consumption as a proxy for fish catch in Kanak communities of the North and Loyalty Islands Provinces (Guillemot et al 2009; Léopold et al. 2004; Labrosse et al. 2006).

These two research areas are carried out alongside the monitoring of commercial fish production, which is currently done by the three provinces and the government of New Caledonia.

5.1.3 Empirical Bases

Our main rationale in this chapter is that the diversity and complexity of fishers' behaviours and practices are a major constraint to properly managing artisanal and small-scale fisheries. This assumption comes from our own research between 2013 and 2019 across the three provinces.

We rely on field observations done in New Caledonia, as well as on interviews conducted with actors from the fishing and conservation worlds and with provincial officers. Three of the authors are residents of the territory and make observations on a daily basis, with relatively regular close and immersive contacts with fisher groups ranging from a few days to a few weeks. It is difficult to estimate the number of interviews conducted over the last 5 years on fishing practices and fisheries management, but we can assert that at least 500 different people across the country have been interviewed, in particular in Yaté, Poum, Koumac, Belep, Ouégoa, Pouébo, Thio, Ouvéa, Lifou and Maré (Fig. 5.2). In all research programmes, we examined the transformations that occur in fishing practices, knowledge and norms. During a recent project funded by the North Province (Sabinot et al. 2019), the 78 professional fishers who benefited from North Province subventions between 2010 and 2016 were interviewed in order to provide qualitative and quantitative data on their catch, the organisation of fishing and distribution and their institutional relationships. Moreover, we use data from the general census conducted by ISEE in New Caledonia in 2014 that included questions about secondary activities in fishing and boat ownership and from a study of New Caledonian household consumption conducted between 2014 and 2017 (Quidnovi, ERPA, ASS-NC, DAVAR 2017).

This chapter begins by describing *who* the fishers in New Caledonia are and where and how they fish. We illustrate the main types of fishing practised in New Caledonia's extensive lagoons and in fresh and brackish waters and the implication of these for management. We then examine the *why*: why do people go fishing and what are their motivations to become fishers? We explore the different aspects of

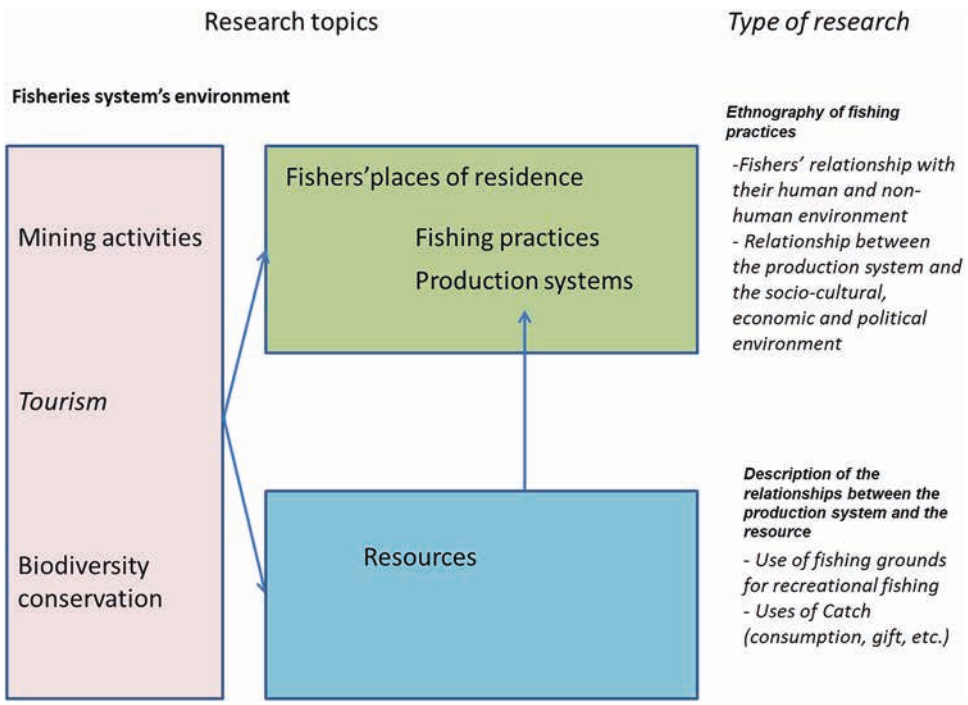

Fig. 5.1 Typology of human and social science studies of fishing in New Caledonia. (Source: Authors 2022)

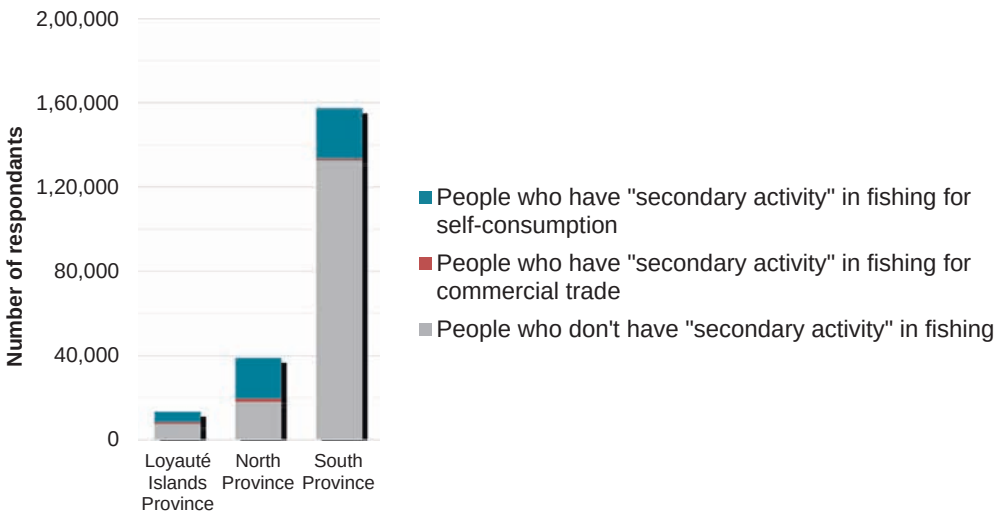

Fig. 5.2 Province-wise summary of the number of inhabitants declaring that they practise a fishing activity for personal consumption or for sale. (Source: ISEE 2014)

fishing practices including sharing during fishing trips, exchange and the consumption and the sale of the catch. After presenting the institutional and legal categories of each of New Caledonia's provinces (under which the fishers can be classified), we discuss the place and role of fishing in the territory. In the conclusion, we explore ongoing efforts at the country and provincial levels to better capture the diversity of fishing practices and understand fishers' multiple dimensions in the management of the sector and in various fisheries policies.

5.2 The Fishers' Dilemma: To Fish and How to Fish, That Is the Question

"Are you a fisher? – No …. – Do you fish? – No… [long silence] Oh yesterday I went fishing with my uncle… – And when was the last fishing trip before? – On Wednesday [2 days before] with my brothers and the children…" This conversation is very frequent in New Caledonia. Many people fish every two or three days but they do not perceive themselves as fishers. They have no fishing license from the

provincial institution. And for Kanak people, if they are not member of a fishing clan whose duty and legitimacy is to provide fish products to customary events, they do not recognise themselves as fishers.

5.2.1 Who Are the Fishers?

Estimating the number of active fishers in New Caledonia is complex because of the informal character of subsistence, customary and recreational fishing, none of which are monitored. The general ISEE Census of 2014 provides some information: There were 280 professional reef lagoon fishers reported across New Caledonia. The Census introduced the notion of "pluriactive" fishers engaged in more than one remunerative activity. Respondents had to indicate whether they were engaged in an ancillary fishing activity, either for their personal consumption or for sale (ISEE 2014). These fishers, men and women, total 1 person in the Loyalty Islands Province, 203 in the North Province and 76 in the South Province (these numbers have increased since 2014). Figure 5.2 presents a summary of responses on ancillary activities. In the case of non-professional fishing, it is possible to estimate the differences between fish sold and consumed in the household.

A very small percentage of respondents said that they fish to sell. In the Loyalty Islands and North Provinces, out of a total of 24,468 individuals, 37% (5019 respondents) and 50% (19,449 respondents), respectively, said that they fish for their own or their household's consumption, with the household being defined as a group of individuals who take their meals together. In the South Province, the situation is different because the population is unevenly distributed spatially, with a strong concentration in the metropole of Greater Noumea (which includes the municipalities of Noumea, Païta, Dumbea and Mont-Dore), where income-generating strategies are much more oriented towards salaried employment. This has fundamentally changed the way of life in the local territories and their relationship with nature over time (Sabinot et al. 2019). These differences could explain why only 15% of the 159,890 inhabitants of the South Province (23,983 individuals) said that they fish for self-consumption. To summarise, subsistence fishing in New Caledonia is broader in terms of stakeholders than commercial fishing alone. The number of boats owned by households is also mentioned in the census. While fishing can be done without a boat, most boat owners use them to fish. Of the 85,063 New Caledonian households reported in 2014, 8258 owned one and 646 two or more (ISEE 2014). They use boats mainly for transportation and fishing and usually lend them to friends and extended family.

Various surveys have also shown that informal and non-professional fishing is very common in New Caledonia, especially in Kanak communities (Guyard et al. 2014; Sabinot and Lacombe 2015; Mallet et al. 2018). A comprehensive survey by the New Caledonian Agronomic Institute (IAC) of a representative number of tribal inhabitants showed that 62% of the domestic groups reported having fished in the coastal lagoons in 2010 (Guyard et al. 2014). However, the intensity of this practice remains highly variable. Figure 5.3 shows that close to three quarters of the population in Kanak communities catch an average of 154 kg of lagoon fish, crabs and shellfishes per year, 16% of people have a production nearly five times higher (690 kg per year) and 13% close to 11 times higher (or 1.7 t per year). This difference can be explained by the heterogeneity of fishers in terms of the time devoted to fishing activity and their gear. Only 13% of households recorded as fishers account for 50% of the fish production. The rest (87% of all households) are very much part-time fishers. Some of them spend just a few dozen hours fishing per year (mainly for special events or holidays) when others spend more than 1000 h, which means a fishing trip perhaps once, twice or three times a week. All part-time fishers are also involved in several subsistence, customary or remunerative activities: agriculture, hunting and work (wage or non-wage). For these households in Kanak communities, even though fishing reduces the time available for other activities, farming is never completely abandoned. For all the working-age members of these domestic groups specialised in "fishing", farming always represents more than 32.2% of their time spent working over the year (Guyard et al. 2014).

Since there is uncertainty about the informal sector's production, an assessment of the total fishery production of New Caledonia is difficult. Two studies in 1994 and 2001 (Dalzell and Adams 1994; Virly 2001) showed that subsistence and recreational fishers account for over half of the total (Fig. 5.4). The data is relatively old, but the permanence of community fishing activities demonstrated above, and the rate of recreational boating in the general population, suggests that subsistence and recreational fishing are still significant.

According to monitoring of commercial fisher's logbooks at the province level, the fishing production in New Caledonia accounts for 3570 t in 2015, including 538 t of lagoon and reef fish, 2840 t of tuna and associated fish and 192 t of sea cucumbers and trochus shells. In 2010, the production was recorded as 3769 t. The lagoon/reef fish and sea cucumbers/trochus shells production were, respectively, 1.3 and 1.2 times higher (656 t and 253 t). The pelagic fish production was very similar (2860 t). In terms of value, the fishing activity was a bit less profitable in 2015 (15 million USD dollars of catch) compared to 2010 (16.9 million USD). The value of seafood products caught exclusively in the lagoons was five million USD in 2010 and 4.1 million USD in 2015 when the value of tuna longliner production decreased from 11.9 million USD in 2010 to 10.9 million USD in 2015.

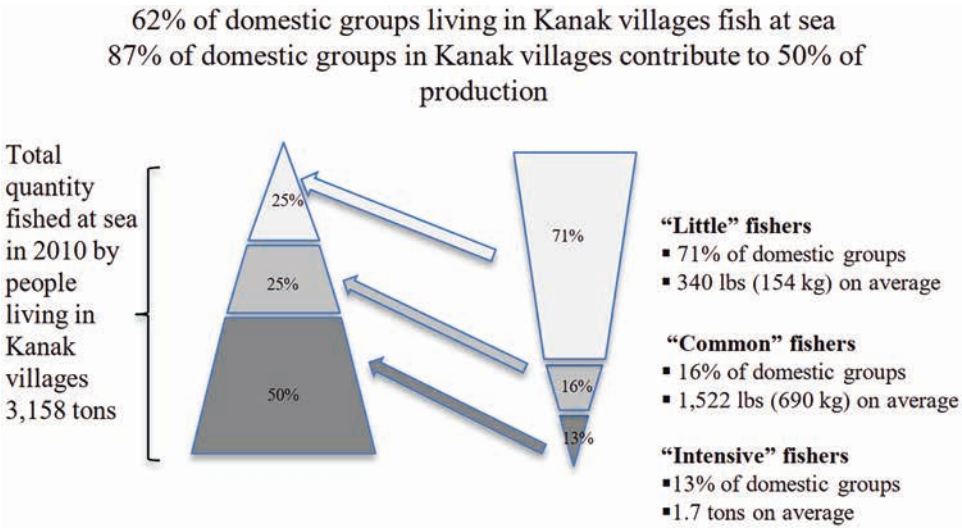

Fig. 5.3 Distribution of fish volume caught by groups. (Source: Agriculture survey in Kanak communities, Guyard et al. 2014)

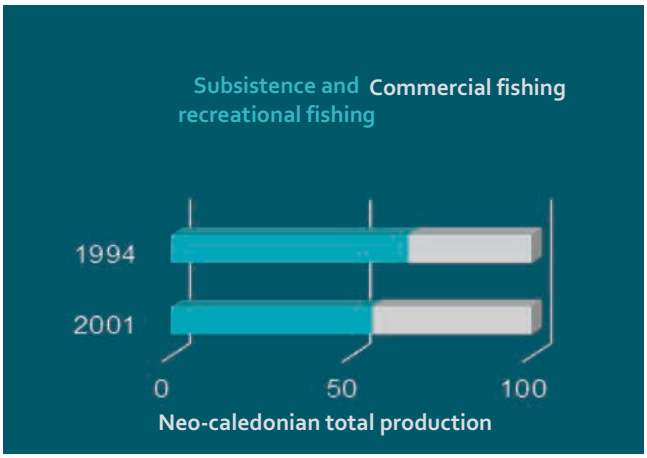

Fig. 5.4 Share of subsistence and recreational fishing in total New Caledonian production. (Sources: Dalzell and Adams 1994; Virly 2001)

According to Guyard et al. (2014), Kanak communities consumed 60% of what they caught themselves, and gifted 19%, with only 21% sold. Community populations therefore earned 644 million Pacific Francs – 5.9 million USD of income from sea fishing. Due to the distribution of the Caledonian population and the unbalanced development of tourism in the archipelago, Kanak households located in the far North, the West and Southeast (Yaté, Thio and Isle of Pines) tend to market their fish more readily than inhabitants of other communities in the rest of the country.

5.2.2 Where and What Do They Fish?

Irrespective of whether fishers practise their activity occasionally, or do so systematically in order to earn an income, they all demonstrate their technical and practical knowledge of the underwater shallow habitats and the inland water bodies that they fish. They select their fishing gear according to the species they target and adapted to the fishing environment, strongly constrained by the weather and tidal changes.

Fishers learn by accompanying their parents or grandparents on fishing trips and in turn pass on knowledge of the fishing grounds to the next generation. Outside Noumea, when Kanak people paddle outrigger canoes, their fishing grounds are in the vicinity of the community. The fishing territory of those who can venture further out to sea includes areas around more distant channels and islets, often associated with coastal clans or communities. In Noumea, fishers are also well adapted to local conditions. They use motorboats or sailboats to fish around the islets and channels of the Great South Lagoon. The professionals also fish outside the lagoon, seeking the deep-water demersal fish on the reef slope at 100–500 m depth, mainly snapper (*Genus Etelis* and *Pristipomoides* of Lutjanidae family), sea perch (*Serranidae* family) and grouper (genus *Epinephelus*). In rural areas, rivers are also fished, mainly for subsistence consumption. Fishers target "crawfish" (*Macrobrachium rosenbergii*), eel and mullet (*Mugilidae*). In Yaté lake, recreational fishers target blackbass (*Micropterus salmoides*), an introduced North American species.

Some practices, such as gleaning, are carried out on reef flats and involve the gathering of shellfish, octopus and crabs (especially in mangroves, using crab traps). Mangroves and mudflats are commonly gleaned by women and young people. Hook and line fishing are also practised on the soft bottoms of the lagoon, at the edge of a rising tide reef flat or around isolated reefs in order to catch seabed or near-seabed species such as members of the Lethrinidae family (emperors, emperor breams and pigface breams). Hook and line fishing are practised by both men and women. In areas where standing in water is impossible, this method is also practised from boats, with or without a rod, with a bait or with a trolling lure to catch carnivorous fish such as the narrow-barred

Spanish mackerel (*Scomberomorus commerson*) or the dolphinfish, locally known as mahi-mahi (*Coryphaena hippurus*) which can grow to 15 kg in weight and a metre in length.

The speargun is very popular in New Caledonia. It is used in a wide variety of environments to catch the most common reef fish (parrot fish, groupers, etc.), firstly all over the lagoons, from the shoreline to the barrier reef, secondly in the channels between the lagoon and the ocean and thirdly on the outer reef slope. It is also used to fish in rivers, in "water holes", which can exceed 10 m in depth. Lobsters and sea cicadas are also caught by dive fishing, and spearguns are used for the larger cray fish. Lobster traps are also used, although less so today. Bare-hand fishing while snorkelling is also practised to collect giant clams (genus *Tridacna*) and mother of pearl shellfish such as trochus (*Trochus niloticus*), as well as sea cucumbers. This last species is not consumed locally. They are exported to the Asian market, mainly China and Singapore, as they have been since the 1800s. They are used in the pharmacopoeia and also eaten (Conand 1986). In Poum, in the North Province, trochus and sea cucumber fishing is an activity that has been part of the territory and the genealogy for a very long time. Some fishers of trocas and sea cucumbers of this commune are direct descendants of the fishers who settled there, originally from the Shetland Islands (Batterbury, pers. com. 2021). Trade in these two shellfish was so important in the second part of the nineteenth and early twentieth centuries that Bichlamar, the language used for international trade in Southern Melanesia and now the national language of Vanuatu (Crowley 1990; Tryon and Charpentier 2004), was commonly spoken among the coastal communities of Northern New Caledonia until the Second World War. In 2017, several Arama seniors confirmed to Sabinot and David that their grandparents still used it when they were young in the 1960s–1970s.

Gill nets and cast nets are used in the lagoons to catch fish with gregarious behaviour that move in shallow water (usually one to seven metres deep) such as dawas (*Naso unicornis*), barbs (*Siganidae*), mullet (*Mugilidae*) or even milk fish (mïkwaa, *Chanos chanos*). Gill nets can also be used to block streams and capture schools of fish as they move upstream or downstream. The encircling net is used to catch pelagic fish, mainly *Selar* spp., but also mullet and mïkwaa. Around the Isle of Pines, this last fish is the target of collective fishing carried out during customary ceremonies. Young people sometimes learn this technique from their elders. The rest of the time, they fish with the speargun, troll baits or hook and line. Children very often start and learn by fishing with a hook and line, walking on the reef flat and only then from a boat moving away from the reef flats to isolated coral "potatoes" and remote islets.

Each type of fishing gear is thus associated with a type of habitat or "resource space", and allows the fishing of the desired species by adjusting to its seasons and anatomical or ecological characteristics (Table 5.1). Irrespective of the purpose of fishing – recreational, subsistence or professional – it is common for many different types of fishing gear to be on board the boats in the lagoon in order to adapt to the species of fish and their behaviour. "Resource spaces" can therefore be associated with particular types of fishing, and catches are measures of productivity, depending both on the resource itself and on the associated technique. However, for fishers with professional status, that is, licensed by one of the provinces, it is usually forbidden to carry a speargun on board during a professional fishing trip.

The resource areas that fishers are normally frequent form an interesting criterion for differentiating them, since each resource space corresponds to specific target species and cor-

Table 5.1 Fishing in resource spaces

Resource spaces	Productivity*	Main types of fishing	Resources
Mangroves	High	Fishing on foot and gill net	Crabs, shellfish and fish
River mouths	Very high	Hook and line and gill net	Fish
Sea grass beds	High	Hook and line, gill net and cast net	Demersal fish, small pelagic fish and sea cucumbers
Pinnacle reef	High	Hook and line and gun	Demersal fish
Pelagic areas of the lagoon	Low	Dragnet	Pelagic fish
Channels	High	Hook and line and gun	Demersal fish
Inner reef flat	Medium	Hook and line, gun and net	Demersal fish and shellfish
Outer reef flat	Medium	Hook and line, gun and net	Demersal fish and shellfish
Reef crest	High	Hook and line and gun	Demersal fish, shellfish and crustaceans
Inner reef drop-off	Medium	Hook and line and gun	Demersal fish, shellfish and crustaceans
Outer drop-off with depth of 20–100 m	Medium	Hand line	Demersal fish
Drop-off <100 m depth	Low	Hand line	Deep-water demersal fish
Pelagic area outside the lagoon	Low	Trolling line	Surface pelagic fish
Pelagic area around FADs	Medium	Trolling line and hand line	Surface and sub-surface pelagic fish (50–200 m)

*By productivity we mean the mass of organic matter developed at a given level of the food chain. It decreases with depth.

responding fishing strategies and techniques. However, few fishers specialise in fishing in a particular area and the species it contains. Apart from those catching deep demersal fish using special techniques (hand line and hand reel), and those using fish aggregation devices (FAD) to fish offshore, most fishers operate across several environments, and their respective fishing practices are just one facet of their fishing "profile". The idea of such profiles was defined in a previous study spanning the whole of Melanesia (David 1997) and is composed of four variables that are still relevant today. These are the "resource space", types of fishing gear used, how the fishing boat is powered and proximity to a household that consumes fish products. It can be applied to three categories of fishers: small-scale commercial fishers, recreational fishers and subsistence fishers. The latter are defined as all non-recreational fishers who fish because of the desire/need for consumption and whose sales only concern the surplus left over after this personal consumption, with these surpluses being always less than half their catches, in number and weight of the catch (David 1997).

Although the concept of the fishing profile is useful to some extent in classifying fishers, it does not cover the diversity of situations, especially the pluriactivity of most Melanesian fishers, and the diversity of combinations of "fisher status/use of production". Thus, a subsistence fisher, who can also be described as a self-consumption fisher because most of his/her production is consumed by this person and their immediate household (he or she only sells surplus production from time to time), will be categorised as an informal fisher if he/she has no professional status. But another subsistence fisher may have the status of a professional fisher, that is, with fishing and commercial licences accorded by the provinces and the government, but with very limited commercial activity because of individual preferences or constraints within the family or social group. Throughout the world, the informal fishing sector, still insufficiently understood to even consider being subject to management, actually spans several definitions that vary depending on the chosen reference system. As we have shown, in New Caledonia, there are two easily identifiable categories of fishers from a legal point of view, the professional and the non-professional: either the fisher has a fishing permit or they do not. We arrive at the same dichotomy if we consider that the "formal" is what is included in public statistics and the informal that which is not. In New Caledonia, at present, only the professional fishery is monitored, through the administrative registration of the fishers themselves and the information concerning their catches in the logbooks submitted to provincial officials. Defining clearly what a fisher is might be a task in its own right, and necessary for any robust accounting of the numbers of fishers and any understanding of the practice in its various dimensions.

5.3 What Are the Underlying Reasons for Fishing?

5.3.1 Why Do People Go Fishing?

The amount of fish caught in New Caledonia is substantial but there are few fishmongers in the territory, most in Noumea. Thus, most fishers do not fish to sell their catch through official market channels. Professional fishers do so, although not all of them, especially in the islands and the North Province. Fishing is both a recreational activity and one that provides protein and generates income. It is also a practice that allows one to survive, to maintain social relations and to assume a function or a role in the Kanak customary system. Understanding why people fish, and how they distribute their catch, involves these social dimensions.

Fishing for their own and family consumption is a major reason fishing forms part of local livelihoods. A follow-up study of New Caledonian households conducted between 2014 and 2017 (Fig. 5.5) showed that families consume most of their catch (from 41% to 46%). This rises to 58–72% in the North and the Loyalty Islands Provinces. According to the study, professional fishing using official channels accounts for less than 38% for all New Caledonian households and less than 22% for of those living outside of the South Province.

Aside from selling to the scarce fishmongers and other retail outlets, fish products are frequently exchanged or sold, legally or illegally, through channels as diverse as markets, via hawkers, personally from individual to individual, or in meeting places like the *nakamal* where, at the end of the day, many Caledonians consume kava, a tranquilising drink made from the roots of the plant *Piper methysticum* (Chanteraud 2001).

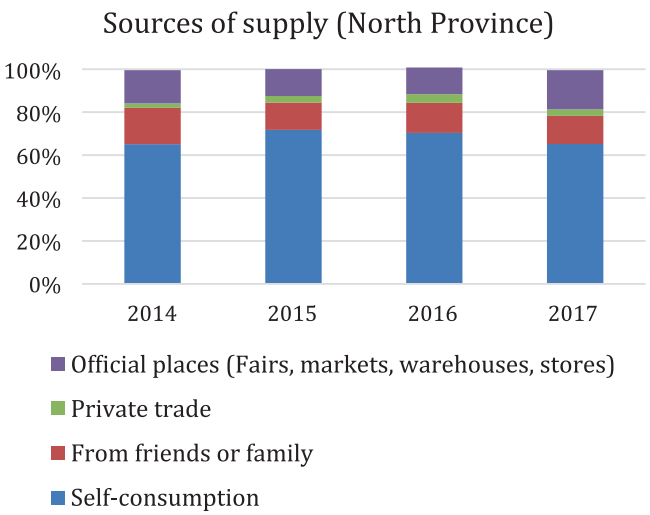

Fig. 5.5 Sources of supply of fishery products consumed by New Caledonian households. (Source: Quidnovi, ERPA, ASS-NC, DAVAR 2017)

5.3.2 What Do the Distribution Patterns of Fish Catch Reveal?

A study of 78 fishers conducted from 2017 to 2018 in the North Province offers a more "socially embedded" view of the economic dimensions and distribution of fishing products and deepens understanding of fisher motivations. It showed that fishers use a wide variety of channels to distribute their fish (Sabinot et al. 2019). All fishers who received support from the Province between 2005 and 2010 were asked about their distribution channels. On average, a fisher from the North Province uses over four different distribution channels and those from the Oceanian Coast use more than six. Figure 5.6 shows to whom fishers generally sell their catch. The two main channels used, regardless of fish product volume, are the local markets (23%) and fulfilling the individual's orders (18%). Because of the difficulties with conserving fresh fish, fishers do fulfil pre-orders where a sale is guaranteed.

It should be noted that in terms of frequency, sales for customary purposes account for 10% of total sales made by professional fishers, almost as much as sales to hawkers (12%) and more than to hotels and restaurants. Some professional fishers mentioned that sales for customary purposes are becoming significant. In addition, a large number of fish are gifted during customary events, and also given to family, friends, children studying in the city, etc.

Fish are also sold at fairs or festivals, where trade has strong social value (Bouard and Sourisseau 2010). Even though there are not many such events, the fact that they account for 11% of the total (in number of channels used, regardless of volume) shows their significance. In addition, fishers from the Belep Islands reported having brought two tonnes of fish to the annual fairs held in Poum and Koumac, two remote northern townships (Sabinot et al. 2019). Some fishers even want to turn professional just so that they can participate in fairs. Bringing fish to a place where people gather, whether to give it away or to sell it, makes it possible for a fisher to assert their "identity".

Whether for commercial or non-commercial purposes, fishers from isolated areas and with limited transport still send fish across the country – mainly through their family network, for communal, religious, tourist, tribal or customary events and for family celebrations – or to send to children or relatives residing elsewhere. To do so, they use the bus, send parcels and transport fish by car in an ice box or in buses laid on for special events. Figure 5.7a, b show the spatial movement of seafood products caught in 2017 by 31 fishers from the Belep islands, Poum and Koumac. Each arrow illustrates a seafood export to another municipality in New Caledonia. The colours reflect the type of event or person receiving the seafood.

Outside official commercial channels, fish transfer in New Caledonia is mainly social and can occur well beyond the fishers' residential area, as Fig. 5.7b illustrates.

5.3.3 What Are the Motivations to Become a Fisher?

As we have noted, an individual becomes a fisher primarily because of their family context, and they acquire social skills and know-how through daily or regular experience while young. Those who fish do so because they have learned from their family and have the desire to continue the tradition in the lagoons or rivers. Despite changing lifestyles, fishing maintains links with the local environment as the communities' "pantry", particularly the lagoon's reef spaces and streams, to provide healthy food for family and relatives. Today, fishing is also a means to finance the purchase of school supplies, telephones, household appliances and other one-off expenses. A few days or weeks can be devoted to fishing so that a particular expense can be met and then the fishers before returning to other activities.

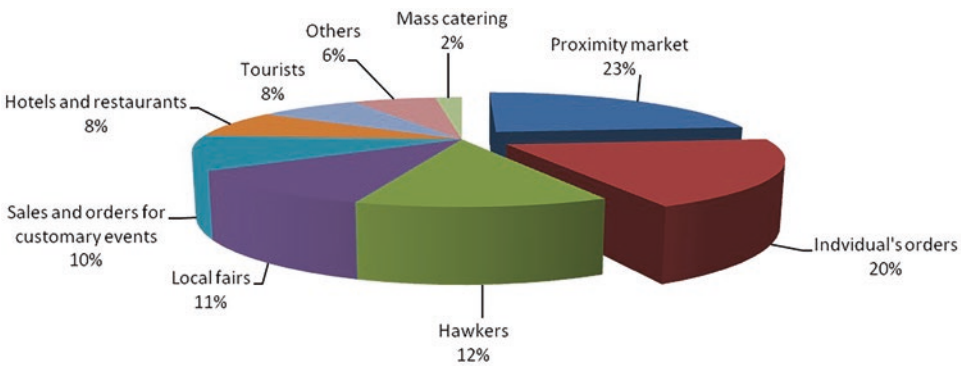

Fig. 5.6 Distribution of responses regarding fish mongers and buyers. Answer to the question "Who do you normally sell to?" (interviews with 78 professional fishers who received funds and subventions from the government of the North Province)

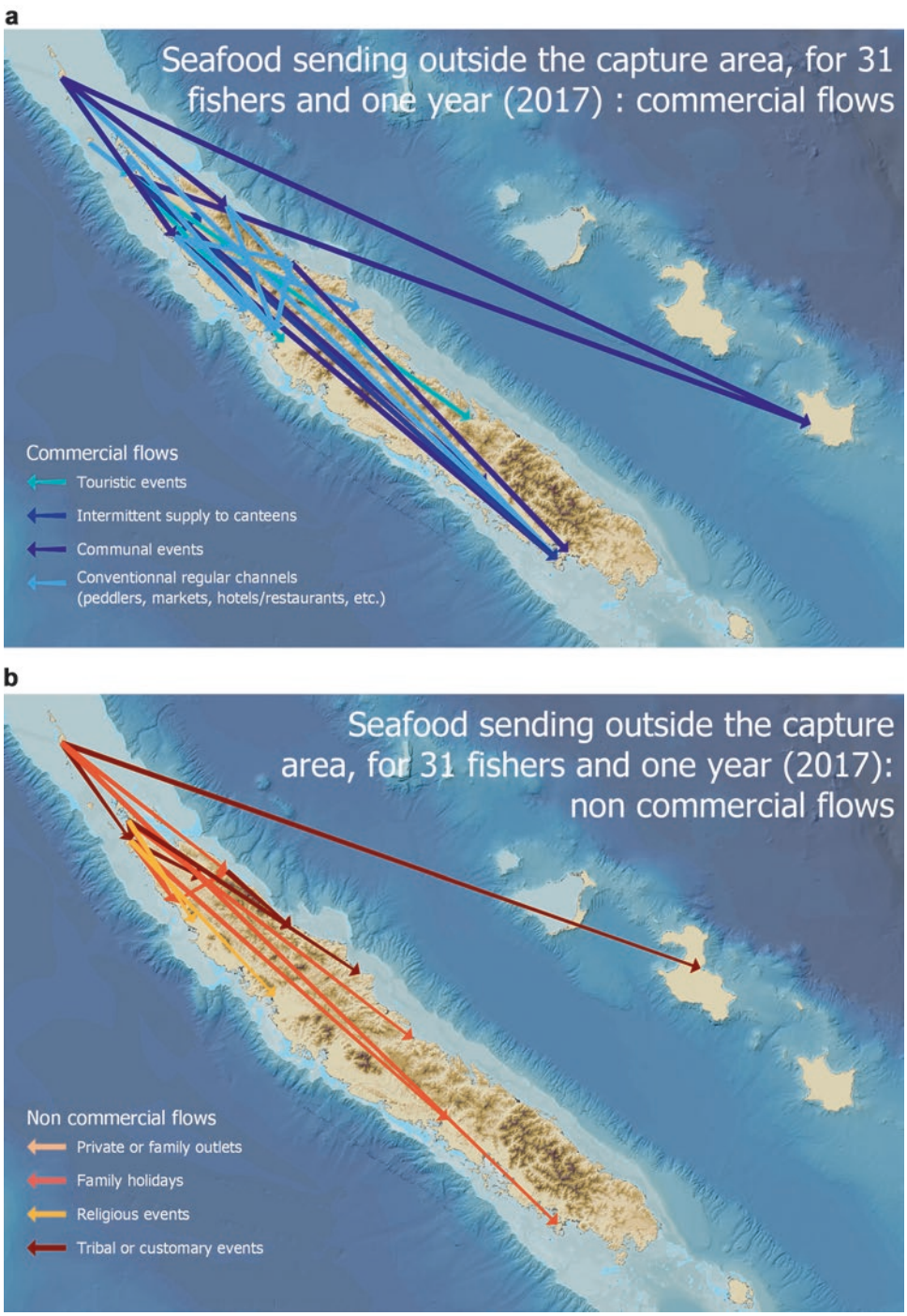

Fig. 5.7 (**a**, **b**) Transport of fish caught in three North Province villages according to the type of destination. (Source: Authors)

The reasons for opting into commercial fishing can include securing financial support to buy a boat or motor and needing money within the family or making contributions to celebrations and events. Fish are also an "exchange currency" that can be used to barter for agricultural or other products. We observe this practice in Greater Noumea with speargun fishers who trade fish for work on their boat, homemade jams and many other types of products and services.

In Kanak communities in particular, several fishers asserted that there is a "necessity" that leads a person to adopt fishing as a primary activity, especially for professional fishing. The testimony of a man from Lifou Island highlighted the various motivations and constraints that force the fisher to professionalise their activities – mainly relating to leadership and the means to cope with the customary duties inherent with the status:

> If I'm a clan leader, I have more responsibilities than my brother. I have obligations and therefore I will not always have time. My brother will have much more time. He will be able to develop an activity that I will not be able to. But somewhere, I still want to undertake this activity. As I said we are pluriactive, we are customary, we are heads of families, we have responsibilities to the parish, we are fishers, farmers ... and one's well-being in the community is based on that balance. By "well-being" I mean that you are accepted by everyone, your clan recognizes you, you are someone in the community. You belong to yours. When there is an imbalance, you feel that there is discomfort. Likewise, those who focus too much on customary activities, who devote all their energy to them, are forced to "parasitize" the other members of the clan in order to be able to support themselves, buy sugar or buy this or that. This is frowned upon. You have to be self-sufficient, while having enough comfort and being well integrated. This balance is needed. (Interview excerpt 2018)

It is clear that pluriactivity is important for Caledonians, regardless of their background or location. Finding the balance between different activities, especially in a context of increasing monetary needs, is an issue that increasingly preoccupies fishers. Tribal members in particular must find a balance between sufficiently remunerative commercial activity and significant involvement in customary life. The latter requires the contribution of not only marine and agricultural products but also personal time.

The specialisations of individuals and their clan are part of their identity and are originally based on the territory they occupy (Leblic 2008; Sabinot and Herrenschmidt 2019). Fisher clans and sea clans have identities based in part on their use of territory, giving them roles that are important for their relationships with their chieftaincy and other clans; for example, their catch may be shared during customary ceremonies or offered to the chieftaincy. Fishing also occupies an important role in non-Kanak societies but in different ways. When receiving guests, it is satisfying to greet them with lobsters or other seafood. For religious events, some fishers are expected to bring the fruits of their catch.

Even when undertaken professionally, fishing remains a family activity. When an individual owns a boat, others also take advantage of it. The boat is used not only for professional fishing with a family crew but also for customary fishing and for transport. A 2017 survey of 78 professional fishers in the North Province found that 92% of the crew members on professional fishing trips were members of the captain's family (Sabinot et al. 2019). The fisher contributes to many different aspects of society through fishing practice and through the type of equipment they own. The economic, customary, religious and family-focused relations around fishing need more detailed study. Fishing contributes not only to the production of intangible wealth but also to stability and opportunities via social relations, in a context where public services are poorly developed, especially in terms of transport.

5.4 Institutional Considerations and Integration of the Multiple Dimensions of Fishing

In New Caledonia, the recognition of fishers by formal institutions and their rights are topics that have been much debated in recent years at provincial and governmental levels. As in other countries, the social relations of fishing were given little considerations until recently.

Teulières-Preston (2000) underlined the juxtaposition of the two institutional systems. Kanak people generally see lagoon areas as part of their territory, with rules and ascribed values that predate colonisation. Land was first appropriated by the colonial power in the 1850s and the arrival of General Du Bouzet in 1855 (Merle 2011). French law divided the "public maritime domain" in reef and lagoon areas according to categories of boats in use, with governmental legislation setting limits on their activities. Customary rules are still respected in areas surrounding clan territories where subsistence and customary fishing activity is practised. The Noumea Accord (1998) reconfigured the marine public domain by giving control over it to the provinces. Different modes of social regulation are thus intertwined, namely, "(i) legislative, (ii) hybrid and (iii) constitutional" (Dana et al. 2016).

New Caledonians come under the purview of government departments and provincial departments. Each of the three provinces has departments and directorates dedicated to fisheries and environmental management, with activities that have a varying degree of transversality. The agencies are the SMRA (Department for the Management of Aquatic Environments and Aquatic Resources) in the North Province, DEI (Department of Integrated Economy) in the Loyalty Islands Province and DENV (Department of Environment) and DDR (Department of Rural Development) in the South Province. These organisations have promulgated environmental codes specifying fishing quotas and species protection status according to the seasons and the level of danger to the species, but they also heed economic development policies where these support fishers and their professionalisation. Provincial rules promote a sustainable fishing and the development of the professional and commercial fishing sector and allow better catch monitoring. While the rules differ from one province to the other, professional fishers wanting to benefit from assistance must all fill out and submit logbooks listing the species and quantities caught and sold.

Despite some subsidies, the legal status of the professional fisher at territorial level is only just beginning to get underway. Steps are in discussion by the Fishers Confederation of New Caledonia to professionalise the sector further, by providing tax exemption schemes to buy materials, and a pension scheme.

Subsistence fishing in rivers and in the lagoon is permitted in all three provinces and does not require permits. There are rules concerning target species and catch quotas. Neither subsistence or recreational fishers can sell their catch. That said, there are many different channels for the exchange and sale of fish and for other fishing products, as we have noted. The public services find integrating these different dimensions of fishing to be challenging.

In the North Province, fishers can obtain subsidies to develop a "traditional economic activities project", and those with other salaried or licensed activities can become professional and then claim provincial subsidies. An additional policy is now being formulated to institutionalise and formalise the status of "*pêcheurs à pied*" (fishers on foot, along shorelines) in the North Province and of subsistence fishers in the South Province. This is partly a surveillance exercise: total catches are unknown, and fisheries and environment departments of all three provinces are trying to better estimate and improve production.

The ability to monitor both professional and informal fishing varies between the provinces and is shown schematically in Fig. 5.8. According to provincial representatives, the logbooks in the South Province report approximatively 90% of production realised by professional fishers recorded in the provincial register, in the North about 50% and in the Loyalty Islands less than 10%. The fisheries departments of the provinces are working to improve the visibility of the harvest, as well as gradually integrating social and informal dimensions.

Given the widespread practice of pluriactivity in the territory, the North Province has made it easier for fishers to receive professional status. They can obtain a fishing licence free of charge if they do not engage in any other income-generating activity that pays more than the minimum wage. In the South Province, the policy is still being formulated, but at present, the fisher must not engage in any salaried activity and must not practise a licensed activity other than one that exclusively concerns the use of the boat for which a professional marine fishing permit is being sought. In the Loyalty Islands Province, the licence is free of charge and fishers are authorised to have incomes from other activities. There is a fish conditioning unit, including an ice plant, financed by the province that offers contracts and guarantees sales for professional fishers. They can also obtain a fuel

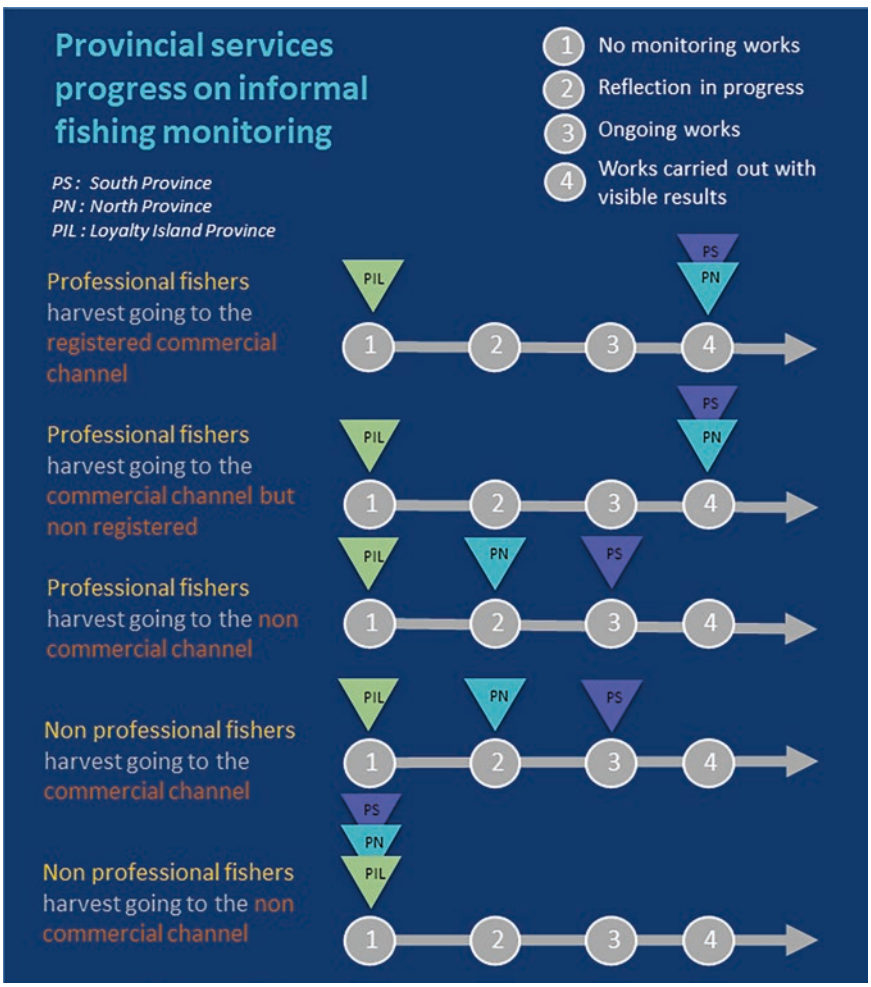

Fig. 5.8 The provinces' ability to monitor catches of professional and non-professional fishers. (Source: Authors)

subsidy, but this is less popular. Generally, all fishers are expected to file fishing catch volume reports.

The residential unit is the most appropriate unit to understand fishers' strategies, since it accounts for pluriactivity and local-level decision-making at the residence level (living unit) or household level (consumption unit). Decisions are often taken by one individual; however, if all members of the domestic group, including men, women and children, practise fishing, then "social capital" is strong. Especially in Kanak communities, the collective dimension goes further than the core family, and different collective levels interact around fishing activity. Moreover, local cultural or even religious associations can be important.

A major problem for public authorities remains the lack of data on fishing. They need to know how fishing decisions are made and how individual and collective decisions are articulated (or not) within local realities and constraints, to better monitor catch rates and inform policy and management decisions. Governance requires management of the frequency of trips, as well as the type of operations and fishing gear mobilised. Managing stocks focuses on target species and size classes; fishing grounds are regulated by permission/prohibition to access specific fishing areas.

Work is still in progress, and the understanding of the multiple dimensions of fishers and of the evolution of the resource continues to be a major challenge. Formalisation by provincial authorities, the professionalisation of the sector and according status to the different categories of fishers will assist knowledge acquisition, monitoring of fishing activities and management.

5.5 Conclusion

In New Caledonia, fishing is the most common human use of coral reefs. This was a country of fishers as well as farmers – but now also one of employment in mining, tourism and other services. Governmental and provincial institutions have put rules in place for the professionalisation of their fishers, intended for those who sell their catch. While they are struggling to do this, and as we have shown, and cannot monitor catches comprehensively, it is important to note that official support for the development of fishing in New Caledonia has largely contributed to the acquisition of boats by fishers. Although a fisher who owns a boat no doubt uses it to fish, permission may be given for others to use it, depending not only on their need for food or income but also as an act of customary respect or to earn prestige and legitimacy. During our investigations, we were often told that a good fisher is a "responsible" and "respectful" fisher. The fisher's social function is essential to the well-being of New Caledonian society as a whole. Recognising these multiple dimensions within small-scale fisheries management policies is difficult, but it has already begun in New Caledonia, and the study of these issues can shed light on evolving practices elsewhere, too.

We have demonstrated the multifunctionality of fishing and in particular the diversity of functions that fishers fulfil and the various roles they play. Research interest has increased in small-scale fishing over the last decade, with renewed interest from international institutions, in particular because of its importance for the food security of coastal populations. The global "Too Big to Ignore" (TBTI) project, led by the University of Newfoundland, which "focuses on addressing viability and sustainability of small-scale fisheries"[1] is a perfect example of the manifestation of this interest.

In our globalising world where urban life tends to supplant rural ways of living, the risk to balanced management of marine fish stocks comes from accelerating concentration in the fishing sector, through large industrial-scale fishing fleets operating in the global ocean. Widespread overexploitation is therefore the dark future that threatens fisheries. In 2016, about 35% of global fish production entered international trade in various forms for human consumption or non-edible purposes. The 60 million tonnes (live weight equivalent) of total fish and fish products exported in 2016 represent a 245% increase over 1976 (FAO 2018). With a population that could exceed 10.3 billion by the end of the twenty-first century (medium variant; the high variant even predicts 14.8 billion; UN Department of Economic and Social Affairs 2022), humanity cannot survive without seafood and without protecting local fishing grounds against poaching and global overexploitation. New Caledonia has seen some efforts to preserve resources and to assist fishers, and future developments will need to be monitored.

The only alternative to avoid the looming disaster of widespread over-exploitation is to bring small-scale fisheries back to the forefront, which means enhancing and acknowledging the importance of small-scale fishers and their knowledge and practices within society so that they can be considered the rightful custodians of a coastal fisheries heritage (Cillaurren and David 2003). To this end, coral reefs and lagoons, for the most part inaccessible to large fishing vessels, can play a key role. New Caledonia, whose reef ecosystem is still in good condition (or even in very good condition in the case of some areas further away from Noumea), could serve as a model for other countries. Giving fishers a real chance to take their place in society, by feeding the population; managing the resources, transmitting their knowledge, values and know-how; bringing money into the home; and fulfilling their customary role when they have to, are future challenges.

[1] http://toobigtoignore.net/.

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