Artisanal fishing tenure rights in Sipacate, Escuintla, Guatemala

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Abstract
The marine artisanal fisheries of Sipacate, a coastal community in the department of Escuintla, Guatemala (13° 56'00 "N 91 ° 09'00" W), contain approximately 150 craft boats and 300 fishermen. Here, around 5 000 people benefit from small-scale fishing. Artisanal fishermen come into conflict with industrial and sport-fishing sectors since the sectors' different fishing areas are not delimited throughout the Pacific of Guatemala. Guatemala lacks a fisheries management plan that emphasizes production control, individual catch quotas and division by fishing sector. The total production of the fishing resource of the Sipacate artisanal sector is unknown and undocumented. Illegal fishing is neither declared nor regulated in the Pacific of Guatemala and aquaculture operations are inefficient. The labour exploitation of fishing communities continues to be important obstacles to achieving sustainability in fisheries and aquaculture. With these aspects mentioned, the coastal communities in Guatemala need to carry out fisheries management and governance. There is evidence that unregulated fisheries and the absence of a fishery management plan promote the depletion of resources. This study will set a precedent for governance and fisheries management, especially in the target species and short-term operational management processes, up to the elaboration and planning of long-term fisheries policies. This will contribute to the development of small-scale fisheries and aquaculture, and further improve the food security and nutrition of the coastal communities of the Pacific region of Guatemala.

1. INTRODUCTION

1.1 Description of the fishery

Sipacate is a municipality of the department of Escuintla in the Republic of Guatemala, with 43 kilometres (km) of coastline (13 ° 56'00 "N 91 ° 09'00" W). Five years ago, this fishery was characterized by having around 400 vessels; currently, there are around 200 vessels and 400 fishermen. Fishermen believe this decline is related to the reduction of fishery resources since many of them can no longer survive with the activity and must dedicate themselves to other livelihoods. Around 3 000 people depend on fishery resources in this area (OSPESCA, 2012; INFOPESCA, 2018).

The fishing area is in the coastal zone between three and five nautical miles (nm) from the coastline. The target species are Croaker (*Micropogonias sp*), Snapper (*Lutjanus guttatus*), Yellowfin snook (*Centropomus robalito*), Sea catfish, Dolphinfish (*Coryphaena hippurus*) and Shark (*Carcharhinus falciformis*). These species are fully exploited (INFOPESCA, 2018; Ixquiac, 2014; OSPESCA, 2012). Fishermen (ship owners, crew and skippers) who participate in this fishery are from the same country, but there are different fishing communities, ports and landing points. There are approximately four fishing communities/ports and landing points located less than 20 km from the fishing zone.

Fishermen who travel from different parts of the country have regular access to this fishery. Those who currently have the legally recognized right in this fishery are owners of vessels, family members of fishermen, and fishermen's organizations. The fishing gear often used in this fishery are: throw nets (esparaveles-Atarraya), gillnets, trammel nets and longlines. No equipment is used while placing fishing gear. There are 150 vessels, with an outboard engine of ≤150 horsepower and the average length of 12-

20 meters (m), weighing 10-50 gigatonnes (GT). Ice containers are used on deck for fish storage. The crew is composed of three people, including one motorist. Fish aggregation devices are not used for this fishery, and the owners of the vessels are individual(s) not involved in the fishing activity of the local community. The owner of the fishing gear is the owner of the boat. Women have the right to own boats and fishing gear. The distance travelled by the boats to access the fishing area is between 10 and 20 kilometres. Fishing trips last, on average, for one to four days.

Conflicts arise between the different interest groups that participate in this fishery. There a number of factors driving this, among which the allocation of fishing rights, differences between fishery managers and participating fishermen, and competition between fishing community and migrating fishermen are important. Conflict persists between different groups too: the small-scale sector and the national industrial level clash, as to fishing communities and sports fishers, while there is competition between different fishing gears for target species. These conflicts appear because the area allowed for the different sectors, respectively is not clarified through regulations.

Additionally, the fishery runs without a management plan. The volumes of fish production are unknown since there is no record of landings, creating a lack of product traceability. The agriculture sector is also in conflict. The fishing community confronts the sugarcane production farms as they pollute the estuary, filtering pesticides and agrochemicals and pouring them into tributaries, whilst putting the hydrobiological resources under risk. The burning of sugarcane causes atmospheric pollution, and the concentration of smoke and soot increases up to 6 times. Dangerous phenomena have affected the fishery since the implementation of tenure rights. These include floods, storms, hurricanes and pollution from agricultural activities and they have caused severe damage on the fishery, affecting vessels, fishing gear, and community infrastructure (houses, schools, stores and fish landing centres).

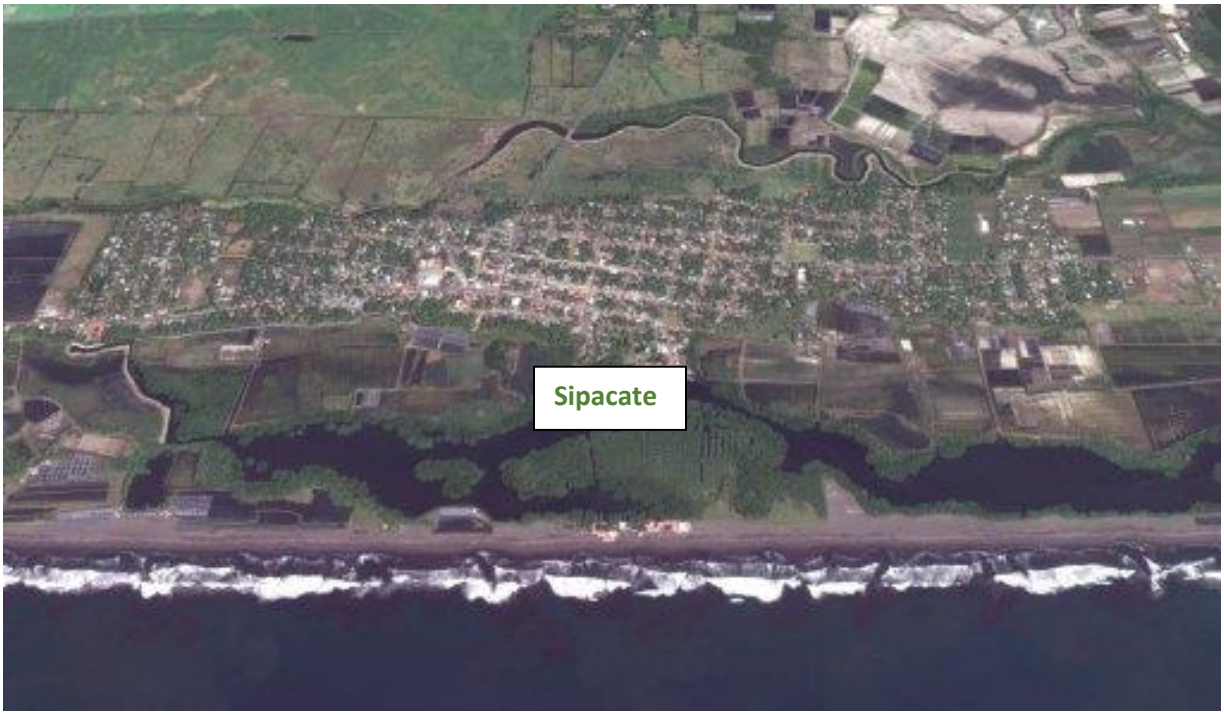

Figure 1. Fishing area map Sipacate, Escuintla-Guatemala, coordinates 13 ° 56 '0 "N, 91 ° 9' 0" W.
Source: Google Maps.

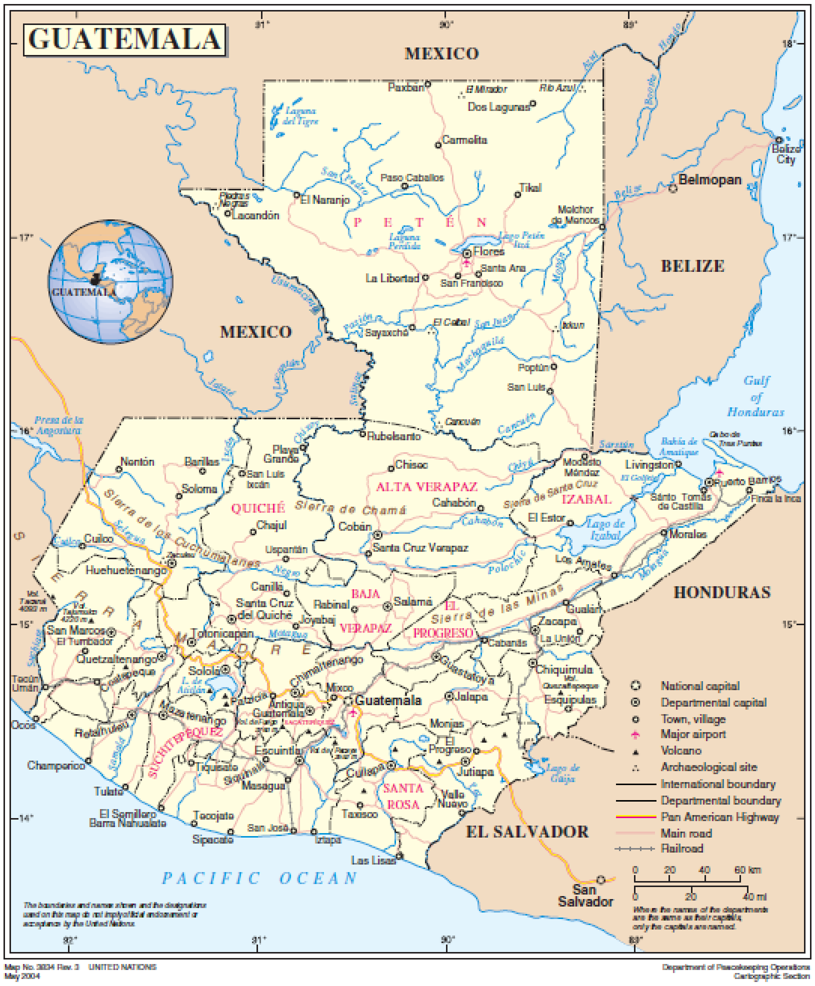

Figure 2. Fishing area map Sipacate, Escuintla-Guatemala, coordinates 13 ° 56 '0 "N, 91 ° 9' 0" W.
Source: United Nations Geospatial Information Section, 2019. Available at https://www.un.org/Depts/Cartographic/english/htmain.htm.

1.2 Economic contribution and social implications of the fishing activity

There are two different sectors in Sipacate to carry out fishing activities: marine (open sea - Pacific Ocean) and continental (Canal de Chiquimulilla). Both activities are mainly for commercial purposes, although officially most of the fishermen carry out subsistence fishing as an inland activity. These two fisheries involve around 5 000 people in secondary, fishing-related roles (restaurants, hotels, fish market stalls, ice factories and stores). The annual fish production estimated for Sipacate is around 11 846 tonnes/year (marine sector) and 574 tonnes/year (continental sector), totalling 12 420 tonnes/year.[1] There are approximately 300-400 marine fishermen and 100-200 continental fishermen on the site, operating an estimated 200 marine and 100-150 continental vessels respectively.

Catch for human consumption is sold through distribution channels – 70 percent to the sales centre, 20 percent to the intermediary and ten percent to local consumption. The sales centres sell 50 percent to the main market of the capital of Guatemala (Mercado La Terminal), 30 percent to the intermediary, 10 percent to the restaurant, and 10 percent to the consumer; the percentage of the catch going to non-

[1] This is according to data provided by the fishing leaders.

human consumption (fishmeal, fertilizer for the agricultural industry) is 10 percent. The approximate percentage of fisherwomen participating in this fishery is 10 percent. Fishermen dedicate full time to this fishery throughout the year (at least 90% of their working time to fish). Alternative livelihoods possible for fishermen are agriculture, livestock, construction works, street trade, saltpans, boat and fishing gear repair, and production.

2. MANAGEMENT OF THE FISHERY AND RIGHTS-BASED APPROACH

This fishery has the particularity that artisanal, industrial fishing and fishermen from other parts of the country have access to the same fishing resource due to the lack of regulations for each sector. In all Guatemalan territory, those who have the right to fish for commercial purposes must have a fisherman's license and registration of the vessel approved by the competent authorities.

2.1 Management of the fishery

The people of Guatemala have jurisdiction over this fishery in Sipacate, as the management of continental, coastal or waters within the exclusive economic zone falls on a single nation. The central government is responsible for the management of the fishing resource. The fisheries management system established for this fishery is government management (information management, non-participatory and top-down).

The institutions that elaborate the regulations governing fisheries management are The Directorate of Fisheries and Aquaculture (DIPESCA) of the Ministry of Agriculture, Livestock and Food (MAGA), the fishermen's association and non-governmental organizations (NGOs). Government authorities and fishermen organizations can provide their opinion and advice in the process of developing fishery regulations.

Management measures used in the fishery include regulation of the permitted characteristics of fishing gear (i.e. mesh size) and regulation of the characteristics of fishing vessels. There are no fishing areas with well-defined limits. DIPESCA and other government entities are responsible for monitoring and enforcing the regulations. Control and surveillance systems monitor the fishing activity both before the fishing activity (permits and fishing licenses) and during (patrol boats), although there is no control during the landing or post-landing. Failure to comply with regulations can result in economic sanctions and confiscation of fishing gear, although these measures are rarely applied.

Lastly, there are mechanisms for conflict resolution in the fishery through the legal system (courts of justice, other legal authorities) and government authority in fisheries management (DIPESCA). Again, these measurements are rarely effective.

2.2 Brief history of former rights-based approaches used in the fishery

Before the allocation of rights, there was no determined mesh size, fishing occurred with manual trawl gear, and boat sizes exceeded 20 m in length. There was also permission to fish with wooden boats in the open sea, whilst vessels were not required to carry safety equipment such as navigation lights, lifejackets or flares. Additionally, there were no determined target species.

2.3 Rights-based approach: allocation and characteristics

The fishery has legally recognized fishing rights that were born in 1975. Individual fishing licenses and territorial rights in fisheries were implemented in 2002, with DIPESCA being the current competent authority that regulates fishing activity in Guatemala.

Initially, the legally recognized fishing rights for this fishery were assigned to private fishermen, fishing boats, owners of fishing vessels, members of a fishing family, and members of fishermen's organizations (cooperatives). These rights were assigned based on historical fishing data and uniform allocation of rights to fishermen who had participated in the fishery. For the initial allocation of rights, the need to ensure basic subsistence rights among poor/vulnerable communities – as well as in indigenous communities and fishermen – was strongly considered.

Fishing rights were assigned in such a way that a species can be caught with specific gear. In general, once the fishing rights have been assigned, the validity time in this fishery is one year. Those who have the right to fish cannot sell or lease legally recognized fishing rights. The ones currently allowed to own the right to fish are private fishermen, fishing boats, boat owners, fishermen from other communities, fishermen's organizations (i.e. cooperatives), national and foreign private companies. There are no specific restrictions about who can own, receive or acquire fishing rights at the tenure level for women, fishermen of non-indigenous origin, ethnic groups, etc.

There are no limitations regarding the number of fishing rights that a person, company, community or foreign company can possess at one time. The rate of non-compliance with current regulations has increased since the rights-based approach was implemented, such as illegal fishing by unauthorized organizations and use of unauthorized fishing gear.

3. CONTRIBUTION OF THE RIGHTS-BASED APPROACH TO ACHIEVING SUSTAINABILITY

3.1 Sustainable use of the resources

This fishery is characterized by the interactions and conflicts between the small-scale artisanal fishery, large-scale industrial fishery sectors and the recreational fishery. Each type of fishery uses different fishing gear in the same area, sharing the same fishery resource. Particularly, the industrial sector uses trawler for the target species (shrimp) and is not selective. For this reason, artisanal fishers change the mesh from 5 meters to 15 meters in the water column and decrease the mesh size from 2.5 inches (6.35 centimetres) to 1 inch (2.54 cm). This measure affects the fishing stock, increases by-catch, and biological impacts the target species since it interrupts their reproduction and survival of juveniles.

This year (2018), non-governmental organizations (NGOs), the artisanal fishermen's association, the fishing community and government authorities started an initiative to design and implement selective fishing gear that is environment-friendly and economically favourable to the fishing community. Some changes in the size of the most important species captured were noted since the implementation of tenure rights. For example, Snapper, Robalo and Dorado have increased in size. No stock evaluations have bene carried out in this fishery for the last 18 years.

3.2 Economic viability of the fishery

This fishery is experiencing an economically unfavourable situation since distances in an average fishing trip in order to catch the target species have increased. There are higher expenses on fuel and inputs, too. Several changes in gear were established since the rights-based approach was implemented, with trammel, longline, and throwing nets. Fishing boats without engines have not suffered changes, but boats with outboard engines/equal to 150 HP have decreased in quantity.

No changes are noted regarding the fishing fleet characteristics since the implementation of rights. However, fishing vessels owned and operated by a remunerated crew have decreased, boats owned by individuals and leased to fishermen have increased, and boats owned by companies have increased.

Aggregating devices are not used in this fishery. Fishermen believe the decline in fishermen (from 800 present five years ago, to 400 currently) is related to the reduction of the fishery resources since many of them can no longer survive fishing and had to participate in other activities (agriculture, salt pans, masonry and street trade).

3.3 Social equality

In this fishery, changes in fishing rights owned by individuals have increased. Fishing rights owned by fishing vessels have also increased, and fishing rights owned by companies declined, as well as fishing rights owned by foreign entities. The initial allocation of legally recognized fishing rights aims to ensure basic subsistence rights of poor and vulnerable communities and focus on the economic viability of fishing activity.

Guatemala is a predominantly chauvinistic country with gender inequality in artisanal fishing. Women are very marginalized in this fishing activity. The allocation of fishing rights has helped to promote social equality and human rights, including the right to food security. The allocation of fishery resources has not respected the rights of indigenous communities, and new generations of fishermen are not ensured access to the resource. Conflicts in different fisheries have increased due to the lack of control and presence of government authorities.

The current rights-based system has helped to aid certain fishermen, but not to the entire fishing community. For example, if natural phenomena occur such as hurricanes, floods and tropical storms, it is possible to identify those who have an individual fishing right to receive aid (health, money transfer, replacement of equipment and infrastructure).

4. MAIN CHALLENGES AND WAY FORWARD

4.1 Challenges for the fishery

There are ways to navigate the challenges facing this fishery:

- **Limit areas for each fishing sector** (artisanal fishing, industrial fishing, recreational fishing). This action will avoid the conflict that artisanal fishermen have with industrial fisheries and recreational fisheries. As mentioned before, they share the same fishing area and target species.
- **Prevent free-access fishery**. This means that the artisanal fishermen with their registered boat are only allowed to fish in the place of origin and not in the whole national territory. That would avoid the conflict with vessels from other territories and neighbouring countries which catch in this fishery.
- **Encourage the creation of a cooperative.** Reactivate the association of artisanal fishermen in Sipacate (APASI). Reactivate the landing centre and include women in trade and processing of fishery products. These actions would strengthen the organization of the fishing community and provide a physical place. Seafood would keep good quality, be marketed at a favourable price and add value when processed. In addition, product diversification could be possible.
- **Have government authorities (DIPESCA and MARINA) present to control fishing gear and landings**. This action would contribute to combat illegal fishing, improve traceability and provide reliable data on production and type of fishery product.

4.2 Improving fishery sustainability in the future

The private, academic, government and community sectors should also be included in the dialogue tables to encourage the management of this fishery, in order to make the necessary changes and to achieve

long-term sustainability of the fishery, adequate management of fishery resources, economic viability and social equity.

4.3 Lessons learned

Without close monitoring and control by the competent authorities, a rights-based system does not work. Conflicts between different users of the same resource (small-scale fishers, industrial fisheries, recreational fisheries) need to be solved by clearly defining exclusive fishing zones for each category.

Territorial rights are key to sustainable development in the fishery; open access to the resource for all nationals and even foreign fishing boats overexploits the resource.

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