

Traditional fishing methods and fisheries management in Gao District, Santa Isabel Island, Solomon Islands

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Introduction

The people from Gao District, Santa Isabel in the Solomon Islands have developed numerous fishing methods. In this paper, we discuss the traditional fishing methods used in the district. Prior to European contact, the fishing technologies used were very simple and ranged from shell gathering using bare hands to more complex methods.

We have selected nine of the most commonly used traditional fishing methods in Gao District. The methods described here include the use of bare hands to collect and gather shells, fish poisoning using local plants, *grao'o* (river or freshwater fishing), bow and arrow fishing, *huahulangi* (mangrove crab tracking and collecting), *vae'e* (turtle fishing), *kwarao'o* (shallow water or reef fishing), *namoko* (reef fishing, netting or trapping) and *gria'a* (bonito fishing). We also discuss here the roles of men and women and traditional fisheries management measures practiced in Gao.

Gleaning for shellfish and invertebrates

Older women and children often gather and collect shellfish in reef areas or in mangrove swamps, rivers and estuaries. In practice, all shellfish and invertebrates that are edible are collected for subsistence consumption or sold for cash. Shells in reef and mangrove areas are usually collected at low tide or during the dry season. Shell collecting is common during extreme low tides. *Trochus niloticus*, *Tridacna maxima*, *Tridacna derasa* and *Turbo* spp. are some of the common shellfish collected from inshore and offshore reefs.

Fish poisoning

Fish poisoning is practiced when very few fish have been caught using other fishing methods. Two kinds of plants are commonly used. One plant is used in freshwater streams and the other is used in the sea.



Map of the Solomon Islands showing the island of Santa Isabel (Source: australianmuseum.net.au/solomon-islands-map).

Barringtonia asiatica, or *phutu* in the local Maringe language of Santa Isabel, is used to stupefy freshwater fish. *B. asiatica* is a common coastal tree on most Pacific Islands. The tree has a large one-seeded fibrous fruit and is buoyant and can float in the sea and travel long distances. The seeds contain saponin toxins and these can stupefy fish.

The seeds are cut open using a sharp knife and white seeds are extracted and pounded using a stone or rock. The seeds are pounded or scraped and wrapped in a piece of cloth and thrown into the stream. Sometimes the seeds are not wrapped in a cloth; instead, the pounding takes place at the upper section of a freshwater stream, allowing the toxin to flow downstream and stupefy fish and eels.

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A shrub called gughunes in the local language (*Derris* spp.) is used to stupefy fish in the sea. These woody plants are found in wetlands and inland forests and belong to the pea family. The plants contain the toxin rotenone in their leaves, roots and seeds. The leaves, seeds and roots are collected and pounded at the beach. Once they have been thoroughly pounded, the leaves and roots are mixed with sand and wrapped in a piece of cloth. The sand prevents the leaves, seeds and roots from becoming too slimy. The toxins are very effective at low tide, especially in tidal pools.

A diver may squeeze the poison into a specific area of the reef where there are brain corals, and where fish may aggregate under these large coral formations. The diver dives to the base of the coral head with the pounded mixture wrapped in a cloth, and then squeezes the cloth to release the toxins.

This is usually repeated in several spots. It takes about two to five minutes (depending on the concentration of the mixture) for the fish to be stupefied and float to the surface. Once the fish are on the surface they are collected by hand and placed in fishing baskets.

Both men and women are involved in collecting the relevant parts of *B. asiatica* and *Derris* spp. and in pounding the seeds, roots and leaves. Women do the actual pounding of the seeds and the leaves, while men generally are the ones to release the toxin if it involves diving. Both men and women release the toxins in tidal pools at low tide.

Grao'o

This method uses a small net made from native or local bark of the plant *Hibiscus tiliaceus*. The branches of the plant are cut and soaked in sea water for several weeks until they are softened enough to make fibers. The fibers are then dried and made into long, thin pieces of rope. The dried ropes are then woven together by hand to make a net. Preparing the bark and weaving the fibers are done by women.

The woven fibers are attached to a hoop made from a larger vine or cane to form a net. This hoop is then attached to the end of long stick (1.5 m). The net scoops fish from streams and rivers. This fishing method is used by both men and women who live in the interior of the island, and is widely used in small streams and rivers.

Bow and arrow

Both bows and arrows are made from plants such as mangroves and bamboos. The bow is made from mangrove roots and is flexible enough to bend. The arrow has three to five prongs, depending on the type of fish targeted. The prongs are tied to the end

of the arrow, forming a triangle if a small sized fish is caught.

When the arrow is shot, any fish that is not pierced by one of the three prongs will become entwined between the prongs.

If a larger sized fish is the target, the arrow will need to have one large barbless prong to pierce the fish's flesh. Bows and arrows are made and used by men for fishing although they are also used for hunting.

Huahulangi

Huahulangi refers to any fishing technique used for hunting mangrove crabs, and involves following crab tracks using a dugout canoe and paddling slowly.

Women are especially skilled in finding mangrove crab tracks and use this fishing method more often than men although men also use this method if requested to help or when required. Older females often pass down their hunting skills to younger women.

Vae'e (turtle fishing)

Vae'e is primarily used to catch turtles, and is usually carried out in the open sea or deep water. A canoe, turtle net and spear are the required tools for this particular fishing method.

More than 10 people are involved, with one or two standing in the front of the canoe with a net and spear. Throughout the whole process, only one person is allowed to paddle and control the canoe. This ensures that there is minimal noise and disturbance to the water, which is essential for this type of fishing. Several canoes may go out hunting for the same turtle.

When a turtle is spotted, all of the canoes try to get close to the turtle before the two standing near the front of the canoe decides whether they will use a spear or a net to capture the turtle. Once the spear or net is used, a number of men jump into the water and onto the turtle.

Those who jump onto the turtle must be good swimmers and divers because the turtle will try and escape by diving down to the sea bottom with the men hanging onto it. Experienced male divers know how to bring the turtle to the surface when this occurs.

Kwarao'o

This fishing method is done on the reef or in shallow water, preferably at low tide. Long vines and leaves of a certain shrub (*Derris* spp.) are gathered for use with this method. The leaves of the vines are crushed using a rock and then wrapped in a piece of cloth and tied. The crushed leaves are from the same plant used for stupefying fish in the fish poisoning method. The toxin is rotenone.

Two or three men paddle out in canoes over the shoals until they locate a large number of fish (or a school of fish). Once the fish are located, the men signal the party of men waiting with their vines on the shore to come to the spot where the fish have been sighted.

The leaves that have been crushed are thrown into the water and the toxins that stupefy fish are released. If a school of fish is sighted, the men quickly form a circle and surround the school. They use five to six lengths of vines with the leaves attached, thereby forming a primitive type of trawl net that lies about 1.5 m below the surface of the water. The stupefied fish float to the surface and are trapped in the narrowing circle of vines and fishermen. The fish are caught by hand and thrown into the canoe.

Namoko (also called *nhamhoko*)

This fishing method involves making a net that is much smaller than the *gria'a* net (see below). The *namoko* net is designed for reef and shallow water fishing, and involves four to five men. The net is made from the bark of a tree, *Hibiscus tiliaceus*, and although it is made entirely by women, men are the ones who use the net for fishing.

The net is square-shaped and has a cone-shaped loop at the center. The lines attached to the corners of the net are used for pulling the net up. All of the fish that become trapped end up in the cone-shaped section of the net. The person who waits in a canoe at some distance away, then unties the loop and the catch falls directly into the canoe.

After each catch, the net is placed on the seafloor until another school of fish swim above the net. The men then signal each other and quickly pull the net up. This process is repeated every time a school of fish reaches the net.

Gria'a

The people of Gao District on the island of Santa Isabel have fished for bonito for hundreds of years. Bonito (*Sarda chiliensis*) are medium in size and swim in large schools. They are smaller than tunas but are similar in shape.

Gria'a is a very complex fishing method designed primarily for catching or netting bonito. This method involves preparing two different nets and is rather unique because the nets are used exclusively for this style of fishing. The two nets are made separately and are prepared from tree bark (*Hibiscus tiliaceus*) and vines. The two nets are tied together to form a larger net that is more than 30 m in diameter.

The larger of the two nets forms the outer part of the main net. The mesh size is approximately 100 cm and is large enough that a person can crawl through the mesh without touching the ropes. The inner part

of the net has a very small mesh opening of about 30 cm. The large mesh size of the outer part of the net allows larger fish such as sharks to escape. The inner section of the net is shaped like a big saucer and is designed to trap and hold the bonito.

Bonito fishing requires specialised skills and knowledge. Net construction requires skills that are passed down from the elders. Some of the elders who still have these skills try to mentor the younger men. Knowledge of local currents and how they flow, and the path that the bonito school follow at certain times of the day is essential for successful fishing.

A tripod-type bench is often raised to about 3.0–4.5 m above the sea surface, and is erected on the fishing ground near where the net is laid out on the sea floor. A watchman keeps an eye on the net.

The success of the bonito fishing depends on all of these tasks. It is necessary to position the nets and the tripod bench at a certain angle so that the approaching school of bonito does not see them. If the net and the tripod bench are incorrectly set up, and the bonito school sees them, they will divert their route to avoid the net.

About three-quarters of the net is spread out on the seafloor at about 4.5–6.0 m below the surface of the water. Only the back of the net is tied firmly to a post about 1 m below the sea surface. The front end of the net is held by the watchman and is well below the sea surface. The watchman is the only person remaining at sea while the rest of the fishermen wait in their canoes at the shoreline.

When a school of bonito enters the area above the net, the watchman pulls the section of the net he is holding so that the front section of the net is raised to about 1.2 m below the sea surface. When this is done, the watchman then signals the rest of the men to come and pull the net up. The canoes do the pulling of the nets.

When the school of bonito approaches the rear end of the net, they react by diving down away from the reef and returning only to find that there is another "reef" in front of them. At this point the bonito react as if the reefs were surrounding them and so dive down and remain at the bottom of the net.

During the confusion, other fish such as sharks escape through the outer part of the net. The bonito remain at the bottom of the net until they are pulled up with the net.

This fishing method can catch up to 2,000–5,000 bonito in a single catch with three to four catches in one day. This type of fishing is done only during festive seasons and especially during the feasting season from November to the end of January each year.

Men and women are fairly represented in this activity, from net construction and rope making to the actual fishing. It is taboo, however, for men and women to have sexual intimacy before fishing for bonito. Because of this belief, only unmarried females are given the opportunity to accompany the men to the fishing ground. The women who remain behind in the village have an important role in preparing leaves and other needed materials for baking the fish.

Fisheries management

The limitations of traditional fishing methods and gear are some of the reasons why marine resources in the Gao District of Santa Isabel are not as heavily exploited as in other areas of the Solomon Islands. Money is required to purchase modern fishing gear and people living in Gao District generally do not have access to modern fishing technologies because they have limited means of earning money.

Most of the traditional fishing methods discussed here are still practiced today. The people of Gao live in a communal society where clans or tribes own land and marine resources communally. Therefore, the management of marine resources is the responsibility of the clan or tribe, which means that everyone is aware of the role they play in resource harvesting.

Another common way of managing marine resources is to have taboo areas that are marked for no fishing for a certain period. This is done in consultation with clan elders and is, therefore, a highly respected management tool. This method is done particularly during times when resources are needed for a feast.

Finally, because marine resources are tribally owned, members of one clan cannot harvest the resources from another clan without permission. This restricts the exploitation of marine resources and prevents overexploitation.