

TRADITIONAL METHODS OF FISHING (SOUTHWEST PACIFIC)

Norman J. Quinn

Discovery Bay Marine Laboratory, University of the West Indies, Jamaica

Keywords: Bamboo trap, turtle hunting, spear fishing, pole and line fishing, trading, trolling, fish fences, lagoon fishing, sea cucumber, fishing baskets, sago palm, scoop nets, oxbow lakes, crab sticks, mud lobsters, subsistence fishing, indigenous technology, Melanesia, fishing dams

Contents

1. Subsistence Fishing Practices and Resource Development

1.1. Fish Harvest and Prospects

2. Traditional Fishing Techniques: An Overview

2.1 Traditional Fishing Techniques used in Melanesia

2.1.1. Bamboo Trap Fishing as Practiced in West New Britain Province, Papua New Guinea

2.1.2. The Construction and Use of Nets as Practiced in West New Britain Province, Papua New Guinea

2.1.3. Spear Fishing as Practiced in West New Britain Province, Papua New Guinea

2.1.4. Pole and line as Used on Buka Island, North Solomon Province, Papua New Guinea

2.1.5. Scoop Nets as Used by the Mundugumor Tribe, East Sepik Province

2.1.6. Fishing Dams as Used by the Mundugumor Tribe, East Sepik Province

2.1.7. Trolling as Practiced in Western Province, Solomon Islands

2.1.8. Fish Fences as Used on Buka Island, North Solomons Province, Papua New Guinea

2.1.9. Catching Baitfish on Buka Island, North Solomons Province, Papua New Guinea

2.1.10. Fishing for Flying fish on Buka Island, North Solomons Province, Papua New Guinea

2.1.11 Kite fishing on Buka Island, North Solomons Province, Papua New Guinea

2.1.12. Basket Trip Fishing as Practiced by Malu Village, East Sepik Province, Papua New Guinea

2.1.13. Scoop Net as Practiced by Malu Village, East Sepik Province, Papua New Guinea

2.1.14 Crab Stick Fishing in the Gulf Province, Papua New Guinea

2.1.15. Women's Fishing Activities at Labu Butu, Morobe Province, Papua New Guinea

2.1.16 Fishing for Mud Lobsters in the Rewa Delta, Viti Levu, Fiji

2.2. Poisoning as a Traditional Method

2.2.1. Fish poisons on Buka Island, North Solomons Province, Papua New Guinea

2.2.2 Spear Fishing as Practiced by Malu Village, East Sepik Province, Papua New Guinea

2.2.3 Poisoning as Practiced by Malu Village, East Sepik Province, Papua New Guinea

2.3. Hunting of Other Marine Animals

2.3.1 Turtle Hunting as Practiced in West New Britain Province, Papua New Guinea

2.3.2 Dugong Fishing as Practiced on Buka Island, North Solomon Province, Papua New Guinea

2.4. Rituals and Customs

2.4.1. Rituals and Customs as Practiced by the Mundugumor tribe, East Sepik Province

2.4.2. Taboos, Customs, and Rituals Practiced in the Malu Village, East Sepik Province, Papua New Guinea

2.4.3 Bamboo Trap Fishing as Practiced in West New Britain Province, Papua New Guinea

3. Traditional Fishing: Constraints and Opportunities

3.1 Significance of Fish in the Culture (Including Diet, Ritual, Ceremony)

3.2 Conservation of Fisheries Resources

3.3 Constraints to Achieving Aims and Objectives

3.4 Opportunities and Prospects

Glossary

Bibliography

Biographical Sketch

Summary

In many areas of the world the economics and politics associated with the introduction of new fishing technology has frequently led to a decline in fish stocks and the impoverishment of many traditional subsistence fishermen.

Data on fish catch by traditional methods are elusive but the total harvest is likely to be significant. For many developing countries with restricted budgets and few trained personnel for fisheries research, it is possible to study only those species involved in earning foreign currency. Even then, statistically valid sampling techniques require equipment, trained personnel, and logistic coordination that is difficult to sustain. So knowledge of the full extent and economic significance of fishing as a village enterprise is poor. Apart from the economic value of fishing there is also considerable impact on human nutrition.

Local fishermen often possess useful information. They know the best fishing locations, the times when a wide range of species can be caught, and how to catch them. People have praised the knowledge of local fishermen but researchers have sought their knowledge and documented their resource usage. The need is for simple and timely data, on boats and trips, tools and catches, routinely reported by fishery participants themselves and openly communicated throughout the maritime community. If this is done, the onset of diminishing returns to fishing effort will be more likely to induce support for limitations on entry or gear while incremental adjustments are still possible. Many of the fishermen in developing countries in the southwest Pacific use fishing practices that have evolved in accord with indigenous biological resources and socioeconomic realities. Selections of traditional fishing techniques are described. The traditional fishing techniques described are representative of those used in Melanesian village fisheries.

1. Subsistence Fishing Practices and Resource Development

Fish in the context of this article includes fin fish, sharks, crustaceans, mollusks, and even marine mammals such as the dugong (see *A History of Fishing*). This wide

diversity of marine life contributes to economic, social, and cultural life of many indigenous peoples. It also provides significant contributions to the nutrition of local peoples and has a role to play in trade.

In coastal regions the world over, subsistence fisheries primarily meet animal protein requirements for the inhabitants. People rely on fin and shellfish for much of their protein requirements. There is a wide diversity of habitats including coral reefs, estuaries, long river systems, and the open sea that contain a rich, under exploited fish resource. Lake fishing in inland regions, especially that relying on traditional methods, e.g., in Africa, southwest Asia, and China is also of considerable importance.

In many areas of the world the economics and politics associated with the introduction of new fishing technology (see *Development of Specialized Ships, Nets, and Equipment*) has frequently led to a decline in fish stocks and the impoverishment of many traditional subsistence fishermen. For example, in the North Yemen fishery in the Red Sea, traditional gillnet and drift net fishermen suffered from the encroachment of company-owned shrimp trawlers on their inshore grounds. The trawlers took large quantities of fish with the shrimp, and most of the fish were simply destroyed and dumped back into the sea. The catches of the traditional fishermen gradually declined.

1.1. Fish Harvest and Prospects

Data on actual fish catch and on trends is scarce according to Thomson, a researcher from ICLARM (International Center for Living and Aquatic Resources Management). Thomson calls for “locale-specific” fisheries projects where the work is based on individual fishing customs and resources of the communities. To achieve this will require a modification of typical western scientific fisheries approaches as problems at the village level in the tropics present both unique opportunities and difficulties.

Several crude estimates have been made of the total subsistence fish catch in Papua New Guinea. These ranged from about 3 700 tons annually to 10 000 tons to 30 000 tons per annum, about 5% of which was marketed. The Asian Development Bank report on the East Sepik Rural Development Project estimated subsistence production from the Sepik flood plain at 8000 tons per annum. The only published estimate based on scientific data showed that for the Purari delta the estimated catch was 1000 tons per annum of fish and crabs for 20 000 people. This was based on field work arising from observation of 250 people over a 25 day period.

For many developing countries with restricted budgets and few trained personnel for fisheries research, it is possible to study only species involved in earning foreign currency. Even then, statistically valid sampling techniques require equipment, trained personnel, and logistic coordination that is difficult to sustain.

As biological models have become more complex, computerized, and data devouring, it has become harder for decisionmakers in developing countries to generate or apply them. Fishery statistics should not be so sophisticated that they can only be collected irregularly by outside researchers. A simpler approach is to work with local fishermen. Local fishermen often possess useful information. They know the best fishing locations,

the times when a wide range of species can be caught, and how to catch them. People have praised the knowledge of local fishermen but only recently have studies sought their knowledge and documented their resource usage.

The need is for simple and timely data, on boats and trips, tools and catches, routinely reported by fishery participants themselves and openly communicated throughout the maritime community. If this is done, the onset of diminishing returns to fishing effort will be more likely to induce support for limitations on entry or gear while incremental adjustments are still possible.

2. Traditional Fishing Techniques: An Overview

Artisanal fishing, defined as a small-scale fishing where the fisherman's wealth is his fishing gear (boats, motors, nets, and lines), which is subject to rapid depreciation and loss, is a major form of fishing. Many of these fishermen use traditional techniques and equipment. They depend for their success on local and indigenous knowledge, much of which has been passed down from generation to generation through a strong oral tradition.

Traditional fishing techniques will vary considerably in detail from region to region, but an analysis of the range of techniques employed show that the techniques and tools used depend on the type of habitat being exploited. Table 1 shows a summary of the principal tools and procedures used in each of the major habitats.

Estuary fishing	nets, spears, poisons
Reef fishing	spear guns, spears, hook and lines, bamboo poles and hooks
Oxbow lakes	poisons, scoop nets, spears, bow and arrows
River fishing	dams, scoop nets, poisons
Night fishing	kerosene lanterns, spears
Dugong fishing	nets, spears
Turtle fishing	nets, spears

Table 1. A summary of the key tools, techniques, and strategies used in traditional fishing arranged according to habitats being exploited

Studies of traditional fishing rights and investigations of ways of encouraging more effective use of existing fishing skills and technology are vital to sound fisheries development. Recognition of the importance of subsistence fisheries is long overdue. These practices are not anthropological curiosities, but vital village industries whose economic contribution has yet to be assessed (see *Ethnographic Aspects of Human Nutrition*).

2.1. Traditional Fishing Techniques used in Melanesia

The traditional fishing techniques described here are representative of those used in Melanesian village fisheries today. These fisheries have been little studied by researchers; hence, no catch statistics have been recorded for fisheries that use

traditional techniques. Having experienced less socioeconomic impact than the fisheries of Hawaii, Guam, and most other Pacific island urban centers, the villagers still rely on traditional methods and practices for some of their protein. Canned meats, fish, and other important sources of protein are luxury items.

2.1.1. Bamboo Trap Fishing as Practiced in West New Britain Province, Papua New Guinea

Small bamboos (*vuvu*) and bush vines (*kala*) must be prepared one month before a trap can be constructed. Once the *vuvu* and *kala* have been cut they are left to dry before being split. After splitting they are further dried before construction. The trap consists of two parts, the inside which acts as a valve and the outside the main body. Trap making is a full-time job and only 2 or 3 traps are made in a month.

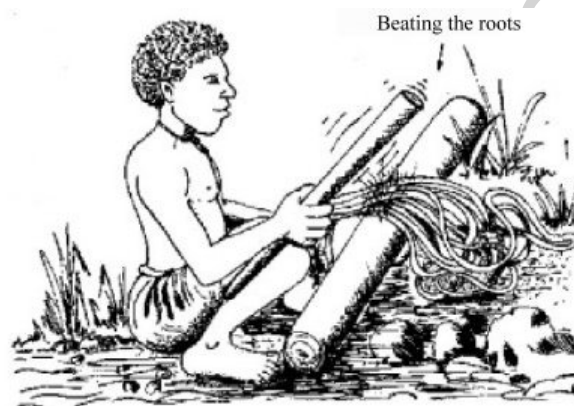


Figure 1. Beating Root. The roots of *Derris uliginosa* are beaten to release toxins that affect respiration.



Figure 2. Basket on river. Along the upper Sepik River Ambunti fishermen have their baskets set ready for the flooding river that comes with heavy rains in the mountains. Traps are made during the good weather and used in bad weather when other techniques can't be used. Bamboo traps were once popular means for catching fish. However, they are seldom used today. The fish caught are mainly sparids (bream), scarids (parrot fish), serranids (cods), and lutjanids (snappers).

-
-
-

TO ACCESS ALL THE 22 PAGES OF THIS CHAPTER,
Visit: <http://www.eolss.net/Eolss-sampleAllChapter.aspx>

Bibliography

Cordell J.C. (1973). Modernization and marginality. *Oceanus* **17**, 28–33. [Excellent review of the costs of development.]

Davis M.T., Newell P.F. and Quinn N.J. (1999). TBT Contamination of an Artisanal Subsistence Fishery in Suva Harbour, Fiji. *Ocean and Coastal Management* **42**, 591–601.

Filewood L.W.C. (1972).

Fishing Industry. *Encyclopaedia of Papua and New Guinea*, **1**, 427–429. Melbourne University Press. [A brief review of the fishing industry pre-independence.]

Haines A.K. (1979). The Subsistence Fishery of the Purari Delta. *Science in New Guinea* **6**, 80–95. [A detailed case study of an estuarine fishery. The work was done as part of an environmental impact study for a dam construction that never happened.]

Johannes R.E. (1978). Traditional Marine Conservation Methods in Oceania and their Demise. *Ann. Rev. Ecol. Syst.* **9**, 349–364. [A classic paper on the value of traditional knowledge and the need to understand its role in subsistence society.]

Johannes R.E. (1981a). Words of the Lagoon: Fishing and Marine Lore in the Palau District of Micronesia, 245 pp. University of California Press. [The best documentation of Pacific island marine lore since Nordhoff's work in the 1930s on Tahitian fishing. The readership will appreciate the details. Well illustrated.]

Johannes R.E. (1981b). Working with Fishermen to Improve Coastal Tropical Fisheries and Resource Management. *Bull. Mar. Sci.* **31**, 673–680. [Provides useful information and provocative ideas for government works, NGO programs, and students.]

Quinn N.J. and Daudau P. (1999). The Traditional Marine Knowledge and the Subsistence Fishery of the Ferafulu Village in the Solomon Islands. *The Journal of the Pacific Society* **84–85**, 13–29. [One of the first papers where an educated member of a subsistence society examines its subsistence fishing practices.]

Quinn N.J. and Matakī M. (1999). The Subsistence Fishery Productivity and Marine Resource Knowledge of Resettled Polynesians from Tikopia Island, Solomon Islands. *Micronesica* **31**(2), 95–106. [A member from a society with a history of cannibalism examines fishing productivity, resource management, and customs.]

Quinn N.J. and Kanalagi J. (1998). Fishing Practices of Naimasimasi Village—A Commuter Village outside Suva, Viti Levu, Fiji. *The Journal of the Pacific Society* **78–79**(21), 115–124. [An insightful document that contains firsthand information about a society that has lived by the bounty of the sea and how this resource is being exploited for commercial gain by interlopers.]

Quinn N.J. and Davis M.T. (1997). The productivity and public health considerations of the urban women's daytime subsistence fishery off Suva Peninsula, Fiji. *South Pacific Journal of Natural Science* **15**, 61–89. [A paper that deals with gender issues in fisheries. Compelling reading of the important contribution that a frequently forgotten segment of society makes to sustaining families.]

Thomson D. (1980). Conflict Within the Fishing Industry. *ICLARM Newsletter* **4**(2), 3–4. [A brief but useful review of economic forces between fisheries interests.]

Biographical Sketch

Dr. Norman J. Quinn was a Lecturer in Fisheries at the University of Technology, Lae, from 1980 – 1986, a Senior J.W. Fulbright Fellow at the University of the South Pacific from 1996-1997, and a Visiting Professor at the University of Papua New Guinea from 1998 – 2000. He is currently the Director of the Discovery Bay Marine Laboratory, University of the West Indies, Jamaica. Many of Dr. Quinn's over 150 publications deal with the people and marine ecology of the western Pacific.