

THE MARITIME CULTURAL LANDSCAPE OF YAP AND MARINE ECOLOGICAL CONSERVATION

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INTRODUCTION

This paper and the presentation highlight the value of the Yapese fish weirs and how they, and the associated intangible cultural heritage can be used to assist modern-day approaches to marine ecological conservation, in addition to keeping traditional sustainable fishing practices alive.

Yap is located 840 km south west of Guam and 1,850 km east-south-east of Manila. It consists of four volcanic islands (referred to as Yap Proper), seven small coralline islands and about 130 atolls forming the ‘Outer Islands’ that cover about 800 km in the north west Pacific Ocean, all of which forms Yap state—one of the four States of the Federated States of Micronesia (FSM).

On the reef flat adjacent to the volcanic islands, the Yapese developed a harmonious, sustainable system of fishing that incorporated spiritual, social, cultural and environmental connectivity and awareness. This is of particular importance to the inshore fishery, which is a sensitive region for fish breeding, and needs to be well conserved, maintained and not overfished. The Yapese employed a number of cultural practices (living heritage) related to fishing, and created a number of tangible cultural heritage, and together they form the Yapese maritime cultural landscape. This system employed a number of fish traps and weirs, with the tidal stone-walled fish weirs—*aech*—surviving to this day.

Yap has now four Marine Protected Areas (MPAs). Yapese are aware that fishing is currently not implemented in a sustainable manner and are declaring ‘no catch zones’ in certain marine areas. Many of the studies associated with the need for and development of MPAs are largely science based, with little relevance and benefit given to traditional fishing (cultural practices and the material cultural). Traditional fishing practices using traditional ecological knowledge were carried out sustainably for hundreds of years and the incorporation of this knowledge into MPA management should not be overlooked.

FISHING AND THE MARITIME CULTURAL LANDSCAPE OF YAP

In an interview of a resident of the village of Leng in Gagil Municipality, Yap, a traditional owner provided the names of four *aech* built by a spirit named “Mer.” Spirits in the form of men, roamed amongst the people of Yap at that time (many years before foreigners came), and when asked why they chose to build and use the *aech* in that way, the answer given by the interviewee was: “Sustaining it so that fish can always be brought home for food” (Jeffery, 2010, Appendix 1). The spirit opened up the back of the *aech* on the seventh day “to let fish come and go, to

make them feel at home” (James Lukan, 2009, personal communication), and closed it back on the seventh day, to create a sustainable fishing practice.

The first seven *aech* were built by spirits and they showed Yapese how to build and use them—to catch fish in a sustainable manner—and it is known that over 800 *aech* are located on the reef flat surrounding the four volcanic islands (Falanruw in Jeffery & Pitmag 2010, pp. 110-111).

Yap Proper’s 100 km coastline contains an extensive area of mangroves surrounded by the reef flat that extends from 200 metres (at its narrowest) to 3,500 metres (in the south). The reef flat has an average depth of 2-3 metres at high tide, and at very low tide, much of it can be dry apart from the deeper holes and the few channels, of which some are as deep as 22 metres (Takeda, 2001, p. 2). The mangroves and reef flat are an important ecological zone for the 426 species of fish and 168 species of hard coral known to exist. Fish have been one of the few sources of protein for Yapese, and although there are now many other introduced sources of protein, fish are still highly valued as a major staple. A number of fishing practices developed, such as employing the use of nets, trawling and spear fishing outside the reef flat (offshore), and different weirs, traps, enclosures and nets on the reef flat (inshore) fishing. The various types of fishing employ magic, rites and were implemented in accordance with a number of social and cultural practices, particularly in sharing the catch, and the tribute required to various people including the village chief. Yapese were described as “holding a fear of venturing out on the seas [beyond the reef flat]” (Suriura, 1939:2), although they did implement offshore fishing, particularly catching flying fish. There are designated zones for the different villages to fish inshore and offshore. For example, all submerged land ‘sea-plots’ adjacent to the villages (and in some cases, beyond the reef flat) were owned by various family estates from within the village, where access could be restricted. Other Yapese could be given access to these waters, and to *aech* (which are also privately owned), as well as other types of fishing practices.

The *aech* style, shape and construction methods were appropriate for their particular locations, which included the nature of the seabed (e.g. shallow water and seagrass beds or deeper water), the strength and direction of the currents and waves, and the types of fish found in the various coastal regions of Yap. Close to the coastline where there are numerous seagrass beds, the *aech* were mostly arrow shaped, with a central shaft (from 30-90m in length) and an arrow head or chamber (up to 60m across), pointing out from the coast, and including a number of smaller compartments in both ends of the arrow head, or just one side (Figure 1). The arrow-head was not symmetrical placed at the end of the shaft, one side could be longer, given it was found fish came from that side and it was used, and was the shaft, to direct fish inside the arrow-head, where they would be trapped when the tide recedes (Hunter-Anderson, 1981, p. 85). In 2008-2009, surveys located 432 *aech*, 46 were mapped, and 12 different styles were found, some with one, two, four or six compartments. A further type near the shore consisted of a wall in an arrow shape acting like a pond, where fish simply came over the top of the wall at high tide and were trapped when the tide receded. Further away from the coastline, *aech* were of different shapes, consisting of V-shaped *aech* with compartments and extensions adjacent to some of the deep blue holes (Figure 2), and a zigzag type without compartments near the edge of the reef flat.



Figure 1: A close to the coastline, arrow-shaped *aech*.



Figure 2: An *aech* placed adjacent to a blue-hole, located away from the coastline.

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Aech of the same style could also have a number of peculiarities such as how the rocks were placed to form the walls, which partly distinguished their geographical location, specific sea conditions, as well as the particular types of fish being caught. Some employed passive fishing, and others had the assistance of groups of people driving fish into the chamber, or men hiding behind the *aech* ready to scoop up fish that entered the *aech*.

The placement of different styles and construction methods of the *aech* provide evidence of how Yapese developed an intimate understanding of fish migration and their habits in the various ecological zones of the reef flat. The beliefs about spirits showing them how to build and use the *aech* in a sustainable manner highlighting how Yapese developed a harmonious relationship with the spiritual and natural world. In an Ethnography of Yap prepared by the Yap Cultural Inventory Group (n.d., p. 27), they documented:

Fishing in Yapese society used to be well regulated with strict rules imposed by traditional authority and power. Ownership of marine areas were as well defined as it was with the ownership of land. Fishing rights and privileges were regulated by the society to ensure that Yapese waters were never over fished or misused.

While only a few of the 800 *aech* are used today, there has been a concerted effort from traditional leaders for more to be restored and the living heritage to be revived to counter the use of unsustainable fishing practices taking place today. This combines a desire to reinvigorate “community spirit”, which is needed to build, maintain and implement the fishing practices associated with the *aech*, and I believe as an associated consequence, a wish to reinvigorate “community spirit” in Yapese society in general (Jeffery, 2013).

MARINE PROTECTED AREAS AND TRADITIONAL ECOLOGICAL KNOWLEDGE

In addition to reviving this fishing practice, four Marine Protected Areas (MPA) have been formed to assist in the conservation and management of fisheries. The MPA have been developed by villages and communities, and therefore they have an ownership of, as well as a responsibility to effectively manage the fisheries for local community benefit. Being areas developed by and for the villages, they can readily adopt traditional ecological management into their management. A study of the marine biodiversity of one MPA, the Nimpal MPA was compared with reference areas outside of the MPA, but not the traditional fishing practices and their traps / weirs (Olsudong, et al., 2012). It is known that there is a higher biodiversity inside fish weirs compared to the surrounding environment in other areas of the world, including Penghu, Taiwan and South Africa (Global Island Network, 2020; Kemp, 2006, p. 34). Traditional fishing practices and knowledge is an obvious area of research given the maintenance of a healthy and sustainable ecosystem approach Yapese employed for hundreds / thousands of years in association with fishing. One study does emphasize the value of incorporating traditional techniques and knowledge into marine / fish conservation in Yap (Secretariat of the Pacific Community, 2013, pp. 3,7,10,14).

There are many positive benefits for incorporating traditional ecological knowledge into the development and management of MPA. It should also be an essential focus in the United Nations initiative, *The Decade of Ocean Science for Sustainable Development (2021-2030)*, particularly. While there is an emphasis on science from a western perspective in this initiative, it needs to be highlighted, as it was in the *2019 UN Decade of Ocean Science Workshop at the Pacific Community*, that indigenous people practiced “indigenous science” (United Nations Educational, Scientific and Cultural Organization (UNESCO), 2020). As in science, they systematically studied the structure and behavior of the natural world through observation, and most likely experimented, and in the Yap fisheries example, developed over many years “sustainable fishing methods utilizing traditional ecological knowledge and practices” (James Lukan, 2008, personal communication).

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