Stone Tidal Weirs Rising from the Ruins

Cultural Scenes from the Seascapes of the Pacific Islands

Cynthia Neri Zayas

Abstract

My paper will deal with local communities in the Philippines, Taiwan and Japan whose shorelines still keep the ruins of their ancient stone tidal weir. These weirs are testaments to sustainable practices of fishing in the past at the same time supported local communities for their protein needs. In my studies from these three countries, I realize that stone tidal weir in co-production with people have the possibility to safeguard nature and its contributions to people because of its simplicity and gentleness in trapping marine animals. They are fashioned as stone barriers, often horseshoe-shaped, built on gradually sloping reef tides. When the tide rises, sea water overflows through the stone barriers, trapping accompanying sea animals which can simply be collected by hand. They are known as ishihimi in Japan, chioh-ho in Taiwan, and atob or atog in the Philippines.

Keywords: Stone tidal weir, ishihimi in Japan, chioh-ho in Taiwan, and atob or atog, Japan, Taiwan, Philippines, sustainable fishing practices, indigenous/local knowledge

Stone tidal weirs are gigantic stone barriers, often horseshoe-shaped, built on gradually sloping reef tides. When the tide rises, sea water overflows through the stone barriers, trapping accompanying sea animals which can simply be collected by hand (Figure 1).

They are known as ishihimi in Japan, chioh-ho in Taiwan, and atob or atog in the Philippines. The names and descriptions of these fishing weirs reflect the ecological condition of the place (see Table 1). For instance, Japanese names refer to a stone wall or barrier since tides recede greatly away from the shore. Thus the water is drained or sieved making the inner sides of the barrier dry. As a result, it is possible to scoop the fish in the deepest portion of the wall. In Penghu, on the other hand, where the water remains high despite the ebbing tide, fish trapped in chambers are in water as high as the fisherman’s chest. In the Philippines, the meaning of the gear denotes the material of stone. In fact, the term atob is a
metathesized form of bato meaning stone. The function of the barriers as trap as well as the condition of the tidal flats as dry completes the meaning of the various terms of the gears. From these descriptions, one can imagine that fish can be procured by hand or with simple tools in an almost dry bed. This is how simple the weir is, though its manufacture is quite laborious, demanding community participation.

(This essay is derived from my previous papers (1994, 2004, 2009a, 2009b, 2009c, 2001) and field research between 1992 and 2010.)

In Europe, Japan, North America and elsewhere in Asia and the Pacific, stone tidal weirs were used by hunters and gatherers thousands of years ago. One anthropologist has referred to them as living fossils of fixed fishing gear. The ruins of these weirs form an imposing scene within the shorelines of the islands. I refer to them as ruins, since most of them are no longer functional now. Except in Penghu and in Nagasaki, I have not seen anyone catching fish inside the weirs. Even though they are no longer in use, the weirs are an important relic of the past. They are imbued with symbols and histories that tell us what they meant and continue to mean, to communities then and now. Even if they might have outlived their usefulness, their revitalization has been possible through the new-found interest in grassroots ecology and cultural heritage. Furthermore, in recent times, owning a stone tidal weir seems a matter of pride and a status symbol. For out-of-the-way villages it becomes a destination for eco-cultural tourism. The ruins have now been restored, at least in part thanks to the new environmental consciousness of many urban dwellers and have now become an interesting piece of terminus. As for me, the relics provide a time capsule or a treasure trove of information about people’s lives and community spirit.

My own interest in waterscapes has relevance to my work in the social and cultural significance of stone tidal weirs in the Pacific maritime communities. Stone tidal weirs appear like stone monuments on the shorelines. The shapes are similar to bamboo stakes used as fish corrals that dotted the Philippine shorelines many years after the Second World War. Unlike the bamboo fish corrals, the stone tidal weirs did not decay. Their images remain in the memory of people who grew up seeing them. In a way, the weirs symbolize the community spirit for they embody the long history of people’s engagement with their environment. Their knowledge of the tides, the currents, the marine flora and fauna, and beliefs in environmental spirits
are lodged on these fine stone masonry, the positioning of the weir, weir openings, levees, pools, among others. My essay seeks to extract local history and knowledge from the scenes of these stone ruins along the Pacific Rim (Map 1). I refer to the areas in the Penghu Archipelago in Taiwan, Kyushu and the Southern Islands of Japan as far as the Okinawan Archipelago, and the islands in the Central Philippines we refer to as the Visayas. It should be noted that the archipelago comprising South Korea, Kyushu, Japan, Ryukyu, Taiwan, Penghu, Philippines, Oceania, etc., or the islands in the Western Pacific Ocean string together to form an arch. These islands have traces of stone tidal weirs. For pre-historians, the region is one interesting study of the spread of the weir technology. I choose to focus on these islands as they are of importance in the transformation of a unique maritime civilization that developed and spread further out into the Ocean. Archaeologist Peter Bellwood believes that Taiwan and the Philippines possess the island lifeways of the greatest antiquity in the world from where the ancient peoples of Australia and Oceania migrated. Not being a pre-historian, I shall leave this problem to them. Let me now walk you to the shores of Penghu, the Visayas and the islands of southern Japan.

The Tightly Packed Shorelines Of The Taiwan Strait

From the diaries and essays of Yu Yonghe translated and published into English as Small Sea Travel Diaries: Yu Yonghe's Records of Taiwan, we learn that in 1697, a Chinese litterateur named Yu Yonghe stopped by the islands of Penghu on his way to Taiwan in search of Sulphur for gun powder. Crossing the Taiwan Strait was a challenging feat, as the northern and southern sea currents traverse each other here. The day they reached the archipelago, the ocean-going junk could not directly anchor into the Penghu’s Mazu Bay. They needed a foot boat, or a sampan, to get to the island. Yu wrote his impressions on the twenty-third day of his voyage which happened to be 15 March 1697:

I take the sampan to shore... The shore is no more than a zhang high and shin deep in fine sand with no grass or trees growing... The islands are all separate and disconnected so that if one looks from one to the other, they are lost in the mists and the waves. The far off islands may not even be visible, while the closer ones still need a boat to reach them. Some of the covs are large, and some small, and some have many residents while others none. But for all the islands, the sea is their field and the fish is their crop. For the rice grains they must depend on Taiwan, as the sandy earth here is not suitable for growing. Everyone lives near the water, so that when the tide comes in, people’s houses are flooded. Even the official cannot avoid this [emphasis mine].

Understanding how seascapes give rise to human activities in a particular time and space is essential to understanding people's lives and activities. Towards the end of the seventeenth century in the middle of the treacherous Taiwan Strait, evidence of human subsistence activity was seen in a rendering of that seascape by Yu: (R)ut for all the islands, the sea is their field and the fish is their crop. The subtext of his diary entry is: how can islanders survive in this hostile environment? Yet, in amazement, he praised how the inhabitants transformed their environment into a productive sea as their field and fish for their crop. As a matter of fact, Yu even noted that when he returned to his junk a fisherman arrived with two giant crabs with a strange shape, and a shark that weighed about 4 or 5 jin, and he had them all prepared for lunch.

Four centuries later, the dominant seascape of the Penghu archipelago hasn’t really changed. It is still dominated by the chioh-ho, a stonefish trap that consists of two long levees (Figure 2). One of them lies landward, while the other stretches into

Figure 2. Chioh-ho with length of 1,300 meters in Jihsii, Baisha County, Penghu
On the shore of Jibei Island, chioh-ho can be fished easily. An old man scoop some blow fish and sardine family fish.

The central heart-shaped part of the chioh-ho is built to a height of about 2 m., while the levees are 1 m. high. At flood tide, the stone levees become submerged, which allows fish to swim into the rock-surrounded area. When the tide subsides, the fish are trapped in the chioh-ho. At this time the fishermen close the entry and use nets to catch the fish in this man-made tide pool. During the ebb tide, weir owners come and wade through shin-deep water with basket and net scoop in hand (Figure 3–4).

The difficulties of living in an archipelago with meagre land space have been possible because of the islanders’ ingenious way of learning from their environment. From their stories, it seems that the technology of the chioh-ho emerged when people began to fish by surrounding the coral reefs with sea plant ‘nets’. From observation, they realized that during high tide, the fish would swim towards the nets. As the shadow of the nets scared the fish, it would drive them towards the reef, thus becoming easy prey for humans. From the observations of the tides, fish behaviour, and the knowledge of sea plant-net fishing, people thought they could catch more with the help of their fellow villagers. Since then, community-based cooperation became one of the pillars of chioh-ho fisheries, showing great community spirit.

Sustaining the communal sense must have been natural for islanders without much resources. Quoting Yu again, ‘...for all the islands, the sea is their field and the fish is their crop’. All islands then is now counted as about 249 stone weirs in the Penghu Archipelago, the area with the highest density of these artifacts, in the whole world. It is said that the abundance of basalt rocks, the tides on the Taiwan Straits and clean water, are factors that explain their existence. Among the islands, Jibei Island, which has 88 stone weirs, has earned the nickname of ‘homeland of chioh-ho’. The number of weirs is imposing enough. Equally impressive is the sight of a horizontal seascape that is filled with massive boulders and stones formed into curlicues, hearts, among others, that can reach up to the level of a two to three stories high building. At sunset, their silhouettes form the structures of an urban space on water.

The numerous basalt rocks however, have made it possible for the people to build gigantic stone tidal weirs, numbering more than 100 now. They can still be seen dotting the Penghu Archipelago. The sheer numbers simply imply that there was a strong community spirit among the builders. Civil works such as these are not
possible without cooperation from many islanders.

**Letting Salt Water Splash on One’s Face for Money**

Building stone tidal weirs was hard enough. Fishing in the chioh-ho is even more difficult. While doing fieldwork in 2006 in Penghu, my landlady in Jibeji narrated to me her experience in fishing. For thirty-three years, until her husband died, she did not stop to rest. In fact, even when she was merely a new bride, she went to the shore to gather shells. Ms Chen was born in 1936 in this island. At the age of twenty she married Mr. Chen. In the first year of her marriage she had a child and took care of it. As the children grew up, there were times when she gathered seashells with her daughter. Her husband’s family at one time owned various shares in eight chioh-ho. Since the weirs are inherited by the sons no one can own one chioh-ho all by himself. That is why Ms Chen’s husband could only fish once every three years for chioh-ho no. 348 (named jiu hou t’ao). Most of the time it was her husband who went to harvest fish, but sometimes she and her mother-in-law would also go and catch fish. Once she had to wake her child (about thirteen years old) up at 4 a.m. to catch fish. The child enjoyed the activity because they could catch much fish. They had to pull up the net twice as it was a large catch. They deposited the catch in the fish well, a hole in the thick wall to keep the fish from escaping. Another time she and her mother-in-law were stunned when they caught large fish. Catching fish then was fun but tough. There weren’t any motorbikes so they had to walk all the way up to area near the lighthouse (more than five kilometres from her house). It was there that the water was chest-deep, and cold. The wind and waves would be strong, but they still had to go to sea. There was a time when her husband went to fish on a stormy day. The water was chest-deep, the wind was very strong, and the waves were very big. She was alone on the seaward, waiting for him, worried about her husband and crying and praying for him. She did not dare tell her mother-in-law about that experience. They would leave ‘damaged’ fish for themselves to eat; pick the good ones for their children and the rest they would either sell or dry to eat during summer (when there was no harvest). Some of the catch they also shared with their neighbours, friends, and family. Earlier they also planted vegetables such as cabbage and green leafy vegetables, but now there was nobody to take care of the fields. Most of the vegetables came now from a neighbouring village. In her old age, at sixty-one, all alone, as her children are on the mainland, Ms Chen would ask other people to patrol their chioh-ho. If there was a catch, she would be given the harvest, which she would also share with her neighbours, friends and family. Always, the harvest of fish depended on the weather and season. There were more fish in the past as compared to the present. For Ms Chen a life in fishing was indeed a difficult experience to the point of ‘letting your face be splashed by salt water for money’.

**Zhi hui yi can Stone Chamber Repository of Knowledge Heritage**

The islanders have often said that the stone tidal weirs serve as a reminder for the current generation of their ancestors’ bare-handed, superhuman perseverance, not quitting laborious work with constant and unending patience in constructing the weirs one-by-one. They surrounded Jibeji with more than 100 weirs (Map 2), the stone tidal weir being considered the repository of the islanders’ knowledge. The weir symbolizes many aspects of their lives; its continuity is every islander’s wish, like continuity of the clan’s lineage.

**The Visayan Seascapes**

The Visayas are located in Central Philippines and are composed of the larger islands
of Samar, Leyte, Cebu, Negros, and Panay. Inhabitants are commonly referred to as Bisaya. The environment is characterized by the overwhelming presence of an inland sea, the Visayan Sea, one of the country’s biggest fishing grounds. The scarce and unproductive soil pushes many inhabitants to search for livelihood elsewhere. It is not surprising that they are well known as crew of commercial and fishing vessels the world over. This section will deal with two areas where the stone tidal weirs were encountered during our field research. I refer to the Gigantes, located on the north-eastern part of Panay Island, and Tinigbas, a hamlet in the municipality of Antiqueon, the western part of the island of Panay (Map 3). The native terms for the weirs are atob, and atog, the two terms meaning the same as used in various islands in Central Philippines.

Dependable Atob in the Gigantes

In the Gigantes, the atob carry the names of their owners. Anyone can build an atob, provided that s/he asks permission from the village chief. In 1970, when food was scarce, Vicente Sy re-built the atob of a deceased person. According to him, just before the Second World War there were several atobs on the islands.

Mr Tanlauan, a native of the island, remembers counting as a child in the late 1960s nine atob clustered around Gabin Bay on Gigante Sur Island. These were owned by people he knew or had heard of, some of whom were kin.

There is one unforgettable story which Felimon, an atob owner, narrated about his atob on Gabin Bay, Gigante Sur Island. One day, a sojourning Bibei Island fisherman informed him about the numerous eels trapped in his weir. With cast-net in hand, they waded into the weir where they netted as much as three wooden boxes (about 35 kg per box, or 105 kg) full of eel. Felimon shared one box with passersby while the rest he bartered for 5 kg of rice.

During my fieldwork in 1992, only one atob remained in Gigante Sur, and twelve in Gigante Norte. I remember at the time that only scattered stones remained of these magnificent stone structures. Newly-wed couples would pick the remaining stones to reclaim some tidal flats for their houses. What was left was the atob-atob, miniature atobs used to prolong the life of fish before they are brought to the market.

Before undertaking in-depth study in Gigantes, our team from the University of the Philippines, College of Fisheries, undertook a survey of the Panay Island. It was during this time that we came across the hamlet of Tinigbas in Libertad, Antique. Here the members of the Philippine team learnt for the first time about an ancient barrier laid out in the inshore of Tinigbas. It was called atog by the natives. The atog that we saw in 1992 in Tinigbas must have been built just before the Second World War. Aquilino Chavez built it with the help of his nephew, Alejandro Alojipan, then twelve years old. Two types of stone were used to construct this atog: corals, also called dead stones, and bato bantiling, also known as bubi nga bato (living stones). The latter are reddish to brown and greyish to black in colour and each stone weighed around ten kilogrammes. The corals had a lighter colour.

The stones for the atog, especially the bato bantiling, were taken from a nearby riverbank. Chavez chose to build the atog in its present location due to its proximity to his home. The stones were transferred using a bamboo raft during high tide and arranged in piles during low tide. According to Alojipan, they transferred and piled these stones for almost a year, and only after his uncle’s daily regular fishing schedule. Chavez himself engaged in panglentiz, a device using goggles, although this fishing technique generally means diving and using a spear.

While still a bachelor, Chavez—who hailed from the nearby farming village of Igacay—worked as a sacada (seasonal sugarcane plantation worker) in La Carlota and Bacolod in Negros Island. Alojipan and the rest of the aged men in the village cannot say with certainty where his uncle got the idea of building an atog. My former student Lilian C. de la Peña (communication) said that she had heard Nanita say, ‘Waan lang nakamaan kung paano niya gindiskartehan’ (Nobody knew how he constructed the stone tidal weir). Chavez’s atog is the only one in Tinigbas and, Alojipan reports, was built even before those found in the neighbouring hamlet of Burunganga. He thinks that Chavez might have seen one in Negros while working there as a sacada and brought the technique to Tinigbas.

Kabilin: Benceathed Piled up Stones

‘Walay manggad nga ginkibil, bato nga tinumpok, [father] left us nothing, but piles of stones’, says Nanita Chavez about the atog Aquilino Chavez built and bequeathed to his children. Her speech evokes sadness over the impoverished situation of fishers. Yet, despite the offer of money, Nanita declined many approaches
to buy the stones. The ruins of atog are an imposing landmark in an inshore landscape of the village of Tinigbas in the province of Antique, Panay Island. Nenita’s father, who died in 1993, built and bequeathed (ginbilin) a 50-fathom long stone weir to his family and community (Figure 5).

*Ginbilin* (from the root nilin, meaning left behind or, in this context, bequeathed) embodies Aquilino [Chavez’s](#) activities. Nenita says that Aquilino visited the *atog* daily. He made sure that the stones constituted an efficient fish trap by stacking them up in an orderly fashion. As he aged and became unable to do his routine by himself, his grandson would at times help repair the extensive stone barrier. Occasionally, he would ask his grand-children to pile the stones up, for which he would reward them with coins. But these stones are now scattered, a result of the gleaners’ search for tiny crustaceans hiding between them. Nenita’s nephew arranges them once in a while, though.

The community, too, has fond memories of the stone wall. Until about 2006, relatives and neighbours would share among themselves fish, shells, etc., trapped in the weir, politely gathering them after the owner had taken his fill. Children frolicked inside the weir while adults gathered shells that were clinging to the piled stones. In the village of Tinigbas, the community has an implicit agreement that no one can own an atog. Concretely speaking, the reefs or the inter-tidal flats are the common property of the village. The ‘accidental’ presence of the stone tidal weir in the inter-tidal flats does not entail ownership of the space where the weir is located. Therefore, although the builder may claim that he built the weir, he cannot claim ownership of the space where it is located. However, builders can claim as their own the catchment (non-return valve) called *taum*, and the stones used for building the weir. In other words, builders may claim possession. This gives them a semblance of ownership, as they can harvest from their *taum* and, if they so wish, can sell the stones. In some cases, stones are merely picked and reused to build a new *atog*. Perhaps the idea is that whatever is left in the commons may be utilized by others if the former proprietor loses interest and abandons it. Nenita, however, does not want to part with the bequeathed piled up stones.

### Owning Stone Tidal Weirs In Japanese Islands

In the Japanese archipelago, it was once said that *isibimi* could be found from Wakayama and Yamaguchi Prefectures, all the way down to Kyushu and the Amami Oshima—Ryukyu Archipelagos.

Modes of ownership of stone tidal weirs, according to Nishimura¹⁴, are either communal, cooperative or individually-owned. *Sukki*, found in Tobase Island and in the Udo Peninsula in southern Kyushu, is connected to age-grades. Other weirs are set for tender annually for the right to fish on them, while in other villages only a few can participate, i.e. original settlers only. In the Goto Archipelago their *sukki* is communally owned, thus the catch is evenly distributed in the community. As part of the autumn ritual, they make an offering to the shrine of fish caught from the *sukki*.

The second type called *kaki na kamuyi* is a cooperative ownership of thirty relatives in Ishigaki or with four owners on Miyako Island. The catch is evenly distributed and rights are inherited from generation to generation. There were times when rights were sold. There is also cooperative ownership in Shimabara Peninsula. Finally, individually owned weirs are found in Nagasaki, Fukuoka, and Saga Prefectures, and all the way to Amami and Kohama Islands. These weirs were most often constructed in the Feudal Period when feudal lords could command labour from common people. A classic example is the gigantic construction on Kohama
Island ordered by the King of Shuri for his concubine. The ruins of this weir can still be seen and the ‘descendants’ of the concubine still enjoy a certain prestige on the island. However, after the Second World War, rights over the weirs were transferred through the Fisheries Law, many owners being compensated for the transfer.

There is a signage in front of a gate to the shore of Ariake Sea in Mizunoura hamlet posted by the Cultural Society of Kourai, the Isahaya Board of Education, dated 1 March 2005. It reads:

**Sukui (Stone Tidal Weir) At Mizunoura Designated As a Cultural Property In 1986**

Stone tidal weir is a primitive form of fishing with a long history in the broad tidal flats of Ariake Sea. During high tide, fishes enter the sukui. As the tide recedes fishes are trapped in non-return valve. Sukui fisheries in the Ariake Sea encompassing Kumamoto Prefecture, Fukuoka Prefecture and the Shimabara Peninsula, were undertaken from the Edo period until the middle of the Meiji period. However, this fishing method can only be seen in Mizunoura.

In 1986 the Mizuno Ura Stone Tidal Weir Fisheries were designated as an important cultural asset of the town. From the Edo to the middle of the Meiji period there were about 200 owners of the sukui in the Ariake Sea. Now only one is left which is owned by Nakashima Yasui (eighty-nine years old at the time of my fieldwork in 2008). The photograph of the sukui I have included here (Figure 3) was taken twelve years ago. We can see some ruins of the former sukui which is now converted into a docking area for barges that was used to build the 7 km. bridge from Takaki-cho to Azuma-cho in Isahaya city. It was also converted into the cultivation of Japanese clams called asari. In Mizunoura, the stone tidal weir tunnial system continues despite the conversion of the fisheries from stone tidal weir to shell and/or seaweed cultivation. Thus, up to now, there can only be six keys to the gate of the tidal flats which was once the site of the sukui. Of the six key holders, five undertake shell culture, as it is more profitable compared to gathering fish in the sukui. I asked the old man, Nakashima, how he acquired his sukui. He said that it was always his dream to have one.

![Figure 6. Sukui in Mizuno Ura, Isahaya City, Nagasaki](image)

The former owner of his sukui decided to sell it to him as no one was capable of maintaining it any longer. Nakashima was able to acquire it with his savings and for more than fifty years has been enjoying the blessing of its catch. The old man simply wants to eat raw fish every day, so he wanted the weir badly.

**Tsuchasaba, for the Kawadayama Onari**

In the past, owning a stone weir was a status symbol. According to Nishimura, stone tidal weirs were originally communally owned in Southern Japan and in the Ryukyus. However, during the Japanese Feudal period, ishibiki was put under the control of the feudal lords. As a result, massive weirs were constructed as forced labour could be utilized to build the stone walls. The number and the scale of stone tidal weirs increased by leaps and bounds. A document dating from 1824 found in Kohama Island in the Ryukyus refers to a royal decree to construct a stone tidal weir for catching fish. The document was to be served to the Tsuchasaba, the title bestowed to a beautiful girl named Kawadayama Onari, who was returning
to the island after her services at the royal palace as a concubine, in the now Naha Prefecture. This particular stone tidal weir’s wall was said to have measured no less than 1,200 m, with a thickness of approximately 1.2 m and a height of 2-3 men, one on top of the other. Nishimura surmises that although written in 1824 the stone tidal weir referred to was perhaps constructed in 1724. In another source cited by Nishimura, the Lord Matsudaira gave away ishibishi to his vassals as a reward for their remarkable achievements during the Shogunate days.16

Kakishi fisheries may seem to possess minor and simple technology, but they are of great importance in the economic daily life of Kohama islanders. For one, su’kuderi (su’ku fishing) has a special place in Ryukyuan culture. This type of fishing is undertaken inside the kakishi and there is a specialist in such gear. Su’ku is a fish used as an offering to the sea god. In ancient Ryukyuan villages, the ino, which means reefs as well as stone tidal weirs, are well maintained so the fish will swim towards it. Perhaps the weir has continued to exist until the present time because of its qualitative importance to the islanders.

Conclusion

Fishing from ancient times to the present is a simple form of gathering activity, even older than agriculture. Archaeological finds point to fishing activity being as old as humankind.17 The ancient stone fish traps on tidal flats are an example of how prehistoric peoples fashioned a passive fishing gear that simply followed the ebb and flow of the tide. Until today, the origins of this stone fish trap can be discerned from drive-in nets practised in many places, such as the shiki akomi ami in Okinawa; panapok or pangatab in the Visayas, binahanan in the Bajau language, the last three all in the Philippines; and shinning yajwejwarang in Penghu, Taiwan.18

Many generations have passed; man-made stone barriers to trap fishes along tidal flats continue to be part of the people’s memories of their milieu. Cultural seascapes formed by stone tidal weir ruins help us understand the daily lives of the common people as we reconstruct their histories. Human and ocean-harmonious relations can indeed be discerned in this gentle fish-trap. Currently, the governments of Japan and Taiwan see these ruins of stone tidal weirs as tourist attractions worthy of being called heritage sites. Japan has led in the preservation and conservation of such cultural relics. I have heard many stories behind ruins of stone tidal weirs in Japan (Nagasaki, Amami Oshima and Kohamajima), Taiwan (in Jihe and Penghu), and of course in the Visayas (Gigantes and Tinigbas). Common to the informants was their great pride in the catch and the hardships people suffered in building and repairing the weirs.

Finally, the stone tidal weirs have found their role in this precarious century. They have taught conservationists, scholars and educators the wisdom of natumi, a Japanese notion of human and ocean-harmonious relationships. In 2010, I together with representatives of seven other countries including Japan came together in Ishigaki Island in the Ryukyus to present the situation of stone tidal weirs in our countries. This inter- national conference spearheaded by Japan invited speakers from Spain, France, Philippines, Korea, Taiwan, and Yap. We certainly hope that through our movements the next generation will be kinder to the ocean.

Except for the elderly members of the community young people no longer relate to weirs as an important heritage of their ancestors. More so since only a select number of scholars and aficionados have knowledge of the existence of the stone tidal weirs. Yet, concern about these weirs isn’t over. Fortunately, to commemorate the importance of this ancient fishing gear, our colleagues in Japan organized an international summit to coincide with the 2010 Convention on Biodiversity. A day after the 2010 Convention on Biological Diversity-Conference of Parties (CBD-COP10) held in Nagoya, Japan, the 2010 International Stone Tidal Weir Summit began for creating natumi in Shiraho, Japan. Of the seven foreign delegates invited to present a paper on the topic, I was one who read a paper19 (Zayas 2010) on the situation of stone tidal weirs in our country. Perhaps one of the most important contributions of this ancient weir to the contemporary needs of our society is its nature as a tool promoting biodiversity of marine species especially in the inshore waters. In Japan and other countries these weirs are markers of historical and cultural heritage of the local people’s human and ocean relations. That is why it has been designated as an example of humans and oceans’ harmonious co-existence. It is simple and a gentle fishing gear, trapping the fish in a natural ebb and flow of the tide. This is the idea of natumi. When the summit ended, the participants signed a
Addendum

I am a practicing maritime anthropologist who has promoted the wisdom of indigenous and local knowledge, including the sustainable use of marine resources. As a matter of fact, from 2016–19 I was one of the more than one hundred volunteer scientist around the world who participated in the Global Assessment for the Intergovernmental Science-Policy on Biodiversity and Ecosystem Services or IPBES. This GA is the most comprehensive ever completed. It is the first intergovernmental Report of its kind and builds on the landmark Millennium Ecosystem Assessment of 2005. In our assessment, one of your findings indicates that Nature and its vital contributions to people, which together embody biodiversity and ecosystem functions and services, are deteriorating worldwide. But not too late as, Nature can be conserved, restored and used sustainably while simultaneously meeting other global societal goals through urgent and concerted efforts fostering transformative change. How? By shifting paradigm to;

(R)recognizing the knowledge, innovations and practices, institutions and values of indigenous peoples and local communities and their inclusion and participation in environmental governance often enhances their quality of life, as well as nature conservation, restoration and sustainable use, which is relevant to broader society. Governance, including customary institutions and management systems, and co-management regimes involving indigenous peoples and local communities (underscoring mine), can be an effective way to safeguard nature and its contributions to people, incorporating locally attuned management systems and indigenous and local knowledge.

We can learn indeed from the way of life and the wisdom of indigenous and local communities inscribed in their practice of fishing from their simple stone tidal weir.

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<td>chiū-hu , 石漁</td>
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<td>The 石 character means stone and chamber. However, scholars refer to it in many ways, e.g. shi-xu (Niishima, 1979), chih-ho (Trov, 2007, 2002 &amp; Cheng Hsien-Ming, 2007). During my fieldwork in Jiābi island I heard it pronounced by the village chief as chu-hü.</td>
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<td>atol, atog, antol</td>
<td>The terms are in dialectical variations meaning a</td>
</tr>
<tr>
<td></td>
<td>Cuyo Island</td>
<td>atol</td>
<td>Barricade of stone to trap fish.</td>
</tr>
<tr>
<td></td>
<td>Samos Island</td>
<td>atol</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Guimaras Island</td>
<td>atog</td>
<td></td>
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<tr>
<td></td>
<td>Gigantes and Negros</td>
<td>atob</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>atob-otob</td>
<td>Small atob to keep fish before bringing to market</td>
</tr>
<tr>
<td>3</td>
<td>Central and Southern Luzon</td>
<td>habasan, pahibas, pahanas, unahan</td>
<td>The terms are in dialectical variations, meaning a</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>place where there is an ebb tide or tidal flats. Cf. for the Japanese &quot;干,&quot; &quot;dry&quot;.</td>
</tr>
<tr>
<td></td>
<td>Panay Island</td>
<td>sara, sada</td>
<td>The dialectical variations to mean</td>
</tr>
<tr>
<td></td>
<td>(S. Luzon Is.)</td>
<td>arada</td>
<td>enclosure from the Spanish word cerrar &quot;close&quot;</td>
</tr>
<tr>
<td>4</td>
<td>Okinawa</td>
<td>kaki, kakii</td>
<td>The term kaki refers to the stone fence or barrier</td>
</tr>
<tr>
<td></td>
<td>Amami Oshima, Nagaki, Isogaki</td>
<td>Uogaki from -魚 &quot;fish&quot; + -gaki &quot;stone fence&quot; or wall</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Taketomi</td>
<td>kashi</td>
<td>The dialectical variations of kaki are kashi, kashi, kashi, haji. The final &quot;i&quot; with a final glotal stop could have been derived from the Malayo Polynesian proto-form &quot;ikan&quot;, from i + kan, &quot;fish&quot;</td>
</tr>
<tr>
<td></td>
<td>Ieionote</td>
<td>kashi</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Kohama</td>
<td>kahii</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Shiraishi</td>
<td>kashi</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Shinjou</td>
<td>hachi</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Kume</td>
<td>yuukachi, ikkachi</td>
<td>Kumi 'to block'</td>
</tr>
<tr>
<td>5</td>
<td>Yoron Island</td>
<td>kumi</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Azski, Nagasaki</td>
<td>moki, miki, mokki</td>
<td>The terms means to strain just like in the making of Japanese paper. In Nagasaki, the term for mesh scoop</td>
</tr>
<tr>
<td></td>
<td>Goto archipelago</td>
<td>Sukuki</td>
<td>used to catch fish is also called sukuki</td>
</tr>
<tr>
<td>7</td>
<td>Fukoka Prefecture, Ishihara, Ishihumi</td>
<td>the term is represented by 3 characters 石干見</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Yamanouchi</td>
<td>stone, dry, see, respectively</td>
<td></td>
</tr>
</tbody>
</table>
Notes

1  With minor corrections this article, this present text is a reprint from the book edited by Rila Mukherjee in 1971 entitled; Living with water - peoples, lives, and livelihoods in Asia and beyond. Delhi: Primus Books. My special thanks to Professor V. V. Hermes for her substantial editing of the original version of this paper. May I also extend my gratitude to Prof. Rila Mukherjee for inviting me to contribute to her book. I, however, accept all responsibilities for any shortcomings of this present version of the paper.


4  Peter Bellswood 2003.

5  Yu Yonghe, Small Sea Travel Diaries: Yu Yonghe’s Recrud of Taiwan.

6  Ibid., p. 25


12  'Pangayoe' is derived from 'pang' (to refer to function) and 'lente' (Spanish for 'glassy').

13  Professor dela Penas undertook supplemental field research on my behalf in 2007. The data obtained during that time were collected by her.


15  Nishimura, Primitive Fishing Methods.

16  Nishimura, 1975, 78.

17  Ibid.


References

Zayas, C. N. “Describing stewardship of the common sea among atob fishers of the Pacific Rim” Islands - Cases from Japan, Taiwan and the Philippines’, South Pacific Studies, vol 31, no. 2, pp. 71-80.