

Tale of Two Successful Fisheries Management Schemes Adopted in Japan

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The SEAFDEC Regional Guidelines for Responsible Fisheries in Southeast Asia: Responsible Fisheries Management (SEAFDEC, 2003) indicates that **fisheries management** refers to the “integrated process of information gathering, analysis, planning, consultation, decision-making, allocation of resources, and formulation and implementation, with enforcement as necessary, of regulations or rules which govern fisheries activities in order to ensure the continued productivity of the resources and accomplishment of other fisheries objectives.” In addition, SEAFDEC (2003) declares that **innovative fisheries management** implies the “decentralization of selected fisheries management functions to the local level and progressive introduction of rights-based fisheries through ...” where **rights-based fisheries** is defined as “fisheries where the right to fish or use of the fisheries resources is licensed or permitted by the competent government authority, giving the licensed fishers access and use rights to the fishing ground. Such rights are accompanied by obligations to comply with the rules and regulations of the right-based regime.” Nevertheless, Garcia et al. (2003) explained that although there are “no clear and generally accepted definitions of fisheries management, its working definition pinpoints to the activity of protecting fishery resources so sustainable exploitation is possible, drawing on fisheries science, and including the precautionary principle.” Moreover, Garcia et al. (2003) also prescribed that the concept of **modern fisheries management** refers to a governmental system of appropriate management rules based on defined objectives and a mix of management means to implement the rules, which are put in place by a system of monitoring control and surveillance, and based on an **ecosystem approach to fisheries management**. Guided by their respective adaptations of the generally-accepted definitions of fisheries management, the Fisheries Cooperative Association of Toshi Island and the Gifu Prefecture in Japan have adopted their particular fisheries management schemes that have proved to be successful through the years, and which could be referred to as mainly *quasi-democratic* and *quasi-persuasive*, respectively.

FAO (1995) declares that modern fisheries management has been practiced everywhere for the sustainability of the fishery resources for future generations. Although strongly based on the ecosystem theory, it is primarily focused on the practice of responsible fishing operations taking into consideration the health of the target fish stocks. In marine ecosystems, where there could be limited forms of direct human intervention, fisheries management strategies are focused in controlling the fishing activities while observing local laws and regulations

on the utilization of the resources. In such cases therefore, Cochrane (2002) indicated that fisheries management refers to “the integrated process of information gathering, analysis, planning, decision-making, allocation of resources, and formulation and enforcement of fishery regulations by which the fisheries management authority controls the present and future behaviors of the interested parties in the fishery, in order to ensure the continued productivity of the living resources.” This implies the need to optimize the use of the fishery resources as source of human livelihood, food and recreation, dynamically regulating fishing activity, meeting resource-related objectives or constraints. In the inland waters, being more affected by environmental problems and where fisheries management has been developed as an extension of wildlife management, Lackey (1999) suggested that substantial amount of direct intervention on the fishery habitat and resources is necessary.

Fisheries Management Scheme Adopted in Toshi Island, Japan: *Quasi-democratic*

Toshi Island (**Figure 1**) is one of four isolated islands under the administration of Toba City in Mie Prefecture, Japan with a unique folk culture and history, and a population of less than



Figure 1. Map of Toba, Mie Prefecture, Japan

Source: Google maps

3,000 people. Situated in Ise Bay of Japan, the Island embraces one of the most active fishing grounds in Japan. It was once, *i.e.* during the Sengoku period, a home-base for pirates. Now, the main livelihoods of the Island's inhabitants are commercial fisheries, aquaculture, and tourism. Toba City, which is known as the sea gateway of the Ise-Shima area, is endowed with rich natural resources and delicious local cuisine, and where the lifestyle of the people, the *Kaijin* (people who live with the ocean) fascinates the tourists. Famous for Mikimoto pearl, Toba also boasts for the world's first successful pearl culture during the Meiji Period.

Some 15 years ago, the Fisheries Cooperative Organization in Toushi Island was re-established as the Fisheries Cooperative Association - Wagu Branch of the Japanese Fisheries Tobaisobe, and now has 240 members. The most common fishery commodities (**Figure 2**) produced by the Island's fishers are snappers and other high-value fishes, as well as seaweeds, *e.g.* gracilaria, wakame.

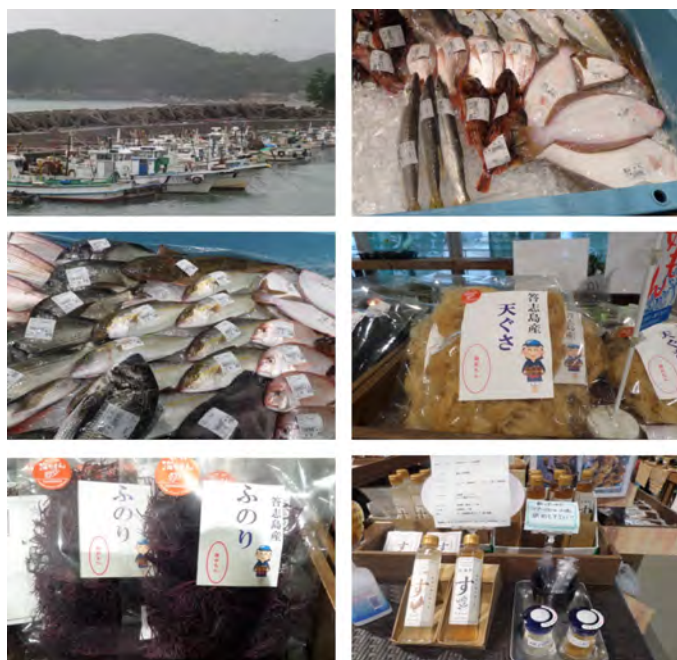


Figure 2. Fisheries in Toushi-jima Island and the main produce

Toushi Island is also known as one of the famous bases of marine fisheries in the Ise Bay with good quality and high-value fishes, which after landing, are immediately sold fresh to wholesalers at the local fish market fully equipped with hygiene management facilities/services in Toushi Island. In view of the good practice of fishing activities and fish handling measures, nobody, not only middle wholesalers but also fish processors and consumers, is worried about the quality of any fish landed at Toushi Island.

The fisheries management promoted by the members of the Association in Wagu Branch could be referred to as quasi-democratic, where decisions are made by the majority of

the members, who act rigidly and work hard to implement such decisions for the good of all members in the Wagu Branch and where bringing benefits to the people of the Island as a top priority. It is also a form of collaborative-participative management because all members contribute to the development of the fisheries vision by taking part in the establishment and enforcement of the rules and regulations for fishing activities, as well as in the fishery resources enhancement and management activities, among others.

Under such management scheme, the Association takes it as their responsibility to teach the younger generation including high school students about the value of fishing as a livelihood and industry, as well as about the Association's system of fish stock conservation and enhancement. This way, the concept of sustainable fisheries through a natural system of conservation is instilled in the minds of the people including the younger generation. So, when big fishes, especially broodstock and spawners are caught, these are released back to the sea to produce more fish in the future, while small fishes could either be released back to the waters to allow them to grow to marketable size, or in some cases, these are cultured in cages for fattening until marketable sizes. In addition, for example, the fishers in Toushi Island agree to take fishing holidays for two days per week, as a form of closed season allowing in a way, the fish stocks to recover. Nevertheless, fish landing amount has been increasing from 120 million Japanese Yen in 2003 to 198 million Japanese Yen in 2016, which means that the Island fishers produce the high value from their target species, and their value is not expressed in terms of quantity (heads or weight) but in terms of Toushi Brand reliability ensuring that freshness is maintained for good quality fishes that are landed in Toushi Island.

Contribution from fisheries to the communities in Toushi Island

For a long time, the Association in Wagu Branch has continued to support the various activities of the communities in Toushi Island. For example, the fishing communities have been organizing the largest three-day God festival on this Island every year supported by the fishers from their catch incomes. During this festival, fishers also make efforts to promote fishery resources enhancement and management activities, and advocate continued fishing activities in a sustainable way. Every people in Toushi Island look forward to participating in this festival. As another example, auction for fish catch organized at the local fish market in Toushi Island is opened not only to registered middle-wholesalers but also to fish processors/owners of hotels/inns within Toushi Island and the Association in Wagu Branch itself.

The Association in Wagu Branch operates a fish processing factory, where local fish and seaweeds bought by the Association are processed into a variety of Toushi Brand fish

products by the women’s groups in the Island for domestic consumption and local trade. As the result, the economy of the Island is activated through the promotion of tourism and circulation of money within the Toushi Island. Such regionalism leads to the wealthy daily lives of inhabitants in Toushi Island, and the population of the Island as well as the number of fishers has been maintained with a considerable number of young generations.

The Quasi-persuasive Fisheries Management Scheme in Gifu Prefecture, Japan

Gifu Prefecture (Figure 3) is located in the center of Japan and is one of its few landlocked prefectures. It is famous for cormorant fishing, which has a history of over 1,300 years. Although agriculture is a major industry because of its vast arable plains, Gifu’s forests also provide materials for woodworking and for constructing the viewing boats used in cormorant fishing.



Figure 3. Map of Japan showing Gifu Prefecture
Source: Google maps

Cormorant fishing is a traditional fishing method in which fishers make use of trained cormorants (*Phalacrocorax* spp.) to fish in rivers. Historically, cormorant fishing has been taking place not only in Japan, but also in China and Korea. To control the birds, the fishers tie a snare near the base of the bird’s throat to prevent the birds from swallowing larger fish held in their throat, although the birds could still swallow the smaller fish.

In the Nagara River of Gifu Prefecture, the Japanese cormorants (*Phalacrocorax capillatus*), larger in size and stronger than the common cormorants, are used for the cormorant fishing. When a cormorant catches a fish in its throat, the fishers bring the bird back to the boat and has the bird spit up the fish. Once a very successful industry, cormorant fishing in Gifu Prefecture now serves primarily the tourism industry of the Prefecture.

Nagara River System of Gifu Prefecture

Aside from cormorant fishing, the Nagara River System of Gifu Prefecture is famous for its sustainable production of “ayu” (*Plecoglossus altivelis*), also known as sweetfish, from inland capture fisheries. The fish which can grow to about 20-30 cm long (Figure 4), is celebrated as one of the tastiest river fishes, especially when grilled or skewered (Figure 5). “Ayu” feeds mainly on water weeds and algae that the fish scrapes from rocks, although the juvenile fish also feeds on aquatic insects.

“Ayu” is highly territorial when it comes to their feeding grounds and attacks any fish entering their territory of about 10-20 m². In March, the adult fish swim down the river to spawn and the larvae enter the ocean and feed on plankton over the winter, returning to rivers in the spring. Some fish survive to spawn for two or three years in succession, although others manage to do it only once.



Figure 4. Commercial size ayu
Source: japantimes.co.jp



Figure 5. Skewered ayu, a delicacy in Japan

The “*Ayu of Nagara River System*” of Gifu Prefecture has been declared as Globally Important Agricultural Heritage System (GIAHS) in December 2015 by the Food and Agriculture Organization of the United Nations (FAO). Established by FAO in 2002, GIAHS aims to ensure the balanced use of the environment and land in a globally important region, while its biodiversity is protected in the practice of traditional agriculture, forestry and fisheries that form a comprehensive system (GIAHS, 2017). The Nagara River System links the aquatic environment and fishery resources to the daily lives of the people inhabiting the upper and lower basins of the River.

Although the Nagara River basin has a population of 860,000 people and the river flows through urban areas, the waters of the river remain clear and clean in the midst of the daily lives of the people. In order to preserve, inherit and develop the Nagara River System, the Gifu Prefecture certifies its products as “Products of Excellence” blessed by the clear waters of the Nagara River. The waters of the River are kept clean because of the cooperation of the people and their sense of responsibility in preserving the environment that had been instilled in their minds. Moreover, in preserving the whole environment, residents from downstream not only contribute the necessary money for reforestation but also go upstream to help the people in their efforts to conserve the mountain system by volunteering in tree planting activities, recognizing the mountain as the source of clear water for the Nagara River. Such close collaboration between the upstream and downstream people has been preserved through the years.

Management scheme for Nagara “ayu” capture fisheries

Arlinghaus *et al.* (2002) described the approaches to the management of habitat, people and fish stocks that make up freshwater fisheries, and recommended that re-stocking could be useful in situations where there is no natural recruitment or there is a need to restore the diminishing stocks. In making the necessary interventions, they also suggested that these should be based on principles of adaptive management and structured decision-making. Parallel to such approaches, Gifu Prefecture promotes their own scheme for “ayu” capture fisheries management in Nagara River, which could be considered as a form of a quasi-persuasive system. Orchestrated by competent manager-experts led by the Governor of Gifu Prefecture and his cohorts including the GIAHS “Ayu of the Nagara River” Promotion Association, Ayu Hatchery Centers by the fisheries cooperative associations, and the Tourism and International Affairs Bureau of Gifu Prefecture which promotes the “ayu” traditional cooking culture, such form of fisheries management scheme allows the inland fishers to carry out their tasks efficiently, having been persuaded in a friendly manner that complying with the rules and regulations would yield in results that best impact on the sustainability of the fisheries in Nagara River. Considering that the waters of the Nagara River are utilized by many stakeholders, the

authorities of Gifu Prefecture also makes sure that their own version of fisheries management for “ayu” is based on an integrative, stakeholder-inclusive approach. Through their sustained promotion of such system, Gifu Prefecture has been a very proud recipient of the GIAHS Award.

“Ayu” Hatchery Centers of the Gujo Fisheries Cooperative Association

In order to maintain the stable fishery of “ayu” at the Nagara River System, the “Ayu” Hatchery Centers located in Gujo City in Gifu Prefecture started to operate seed production from 1983 through the initiative of the Gujo Fisheries Cooperative Association. The hatchery has since then been supplementing the shortage of wild “ayu” by providing juvenile “ayu” for release into the River system. The current production of “ayu” from the hatchery is more than 60,000 kg of juveniles annually. The annual plan of operation of the hatchery starts in the fall when eggs are collected from wild matured “ayu.” In winter, the eggs are raised to larvae, and during the spring, the fry of “ayu” is released into the River system. In keeping the genetic diversity specific to “ayu” in the Nagara River, only matured “ayu” coming from the River are used for the hatchery’s operations.

Gifu Prefectural Inland Fisheries Training Center

To contribute to the development of the GIAHS declared “Ayu of the Nagara River System” as well as inland fisheries in general, the Gifu Prefectural Inland Fisheries Training Center was established in 2016. Specifically, the Center also takes charge of the dissemination of knowledge, techniques, experiences, and systems of inland fisheries and aquaculture. The Center offers training programs that are tailored to the needs and requests of countries but focusing mainly on fishing ground management, stock enhancement, and aquaculture techniques of inland fish species. The Center also dispatches its researchers to developing countries for on-site technical support regarding inland fisheries. In May 2016, SEAFDEC and Gifu Prefecture signed the Memorandum of Understanding (MOU) for the promotion of educational and technical cooperation for the sustainable development of inland fisheries in the Southeast Asian region. Since then, representatives from the Southeast Asian countries had availed of the training courses organized by the Center. It is therefore expected that through the said MOU, the development of inland fisheries in the region would be enhanced for food security and economic stability, especially in communities where inland fisheries is the main livelihood.

Way Forward

Regarding the quasi-democratic fisheries management in Toshi Island and the quasi-persuasive fisheries management in Gifu Prefecture, both successful fisheries management

schemes are examples of decentralized fisheries management by promoting rights-based fisheries to fisheries cooperative associations or fishers in their regions/communities. A common key point for both success stories is that fisheries cooperative associations or fishing groups make all fishers follow the decisions or rules/regulations, including fishers in local communities. This is a basic and important feature in rights-based fisheries, and the two examples have been carried out, in particular with leadership by leaders and strong local patriotism in each region that led to the formulation of good fisheries management with ecosystem approach as the result. Although not very easy to promote, such systems could also be possibly realized in other regions not only in Japan but also in the Southeast Asian countries. In addition, it should be noted that Toshi Island is located at the Ise Bay, where the Nagara River brings abundant nourishment and formulates the favorable fishing ground. The above examples therefore demonstrate that well-preserved forests on the upstream and unpolluted rivers that go downstream are indispensable to heighten the biological diversity of the coastal waters and habitats.

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Mr. Akito Sato, Dr. Kom Silapajarn, and Ms. Virgilia T. Sulit comprised the September 2018 SEAFDEC Mission Team to Japan, visited among other places, Toshi Island and Gifu Prefecture in Japan where they learned lessons from their respective fisheries management schemes that have proven to be successful, and observed that such schemes could also be adapted for the sustainability of fisheries in the Southeast Asian countries.