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Nuclear power plants and biocultural renaissance: A case study of Iwaishima Island in the Seto Inland Sea of Japan

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Abstract For three decades, Iwaishima Islanders have rejected the proposal for a nuclear power plant to be built 3.5 km from their home. Located in the Suo-nada Inland Sea, which has miraculously escaped contamination, dredging of sand, or reclamation that damaged the Seto Inland Sea after WWII, the islanders maintain their livelihood by marketing fresh fish and organic produce. Based on studies on the biodiversity and recent interviews, some underlying reasons for their unyielding struggle have come to light: (1) some worked in Fukushima Daiichi NPP, and knew its damaging effects on human health and the bioregion; (2) islanders exchange goods and services, with minimal dependence on cash; and (3) they have revived the 10-century-old *Kanmai* (divine dance) festival held every 4 years.

Introduction

There is a projected site for a nuclear power plant on Nagashima Island in the Seto Inland Sea of Japan, the widest partially closed water system in East Asia (Figs. 1 and 2). Three decades have passed since this project was proposed in 1982. The natural environment of the Seto Inland Sea has deteriorated since the 1970s due to the effects of landfilling, dredging, and industrial pollutants associated with the development of industrial complexes in Japan.

It was recently revealed, however, that despite the general degradation of the environment in this inland sea, the biodiversity of the Suo-nada Sea, the western-most part of the Seto Inland Sea, is still exceptionally well conserved. Furthermore, the sea around Nagashima Island has proved to be the best-conserved shallow water maritime biodiversity in Japan. Since 1999, biological and ecological discoveries have been made around Nagashima Island where Kaminoseki Nuclear Power Plant has been projected by CEPCO, Chugoku Electric Power Company (Kato, 2010: 11–22).

This paper points out that this biodiversity hotspot of Japan has been preserved thanks to the local community of Iwaishima Islanders (478 inhabitants as of September 2012), who live 3.5 km from the proposed site. They have not only used

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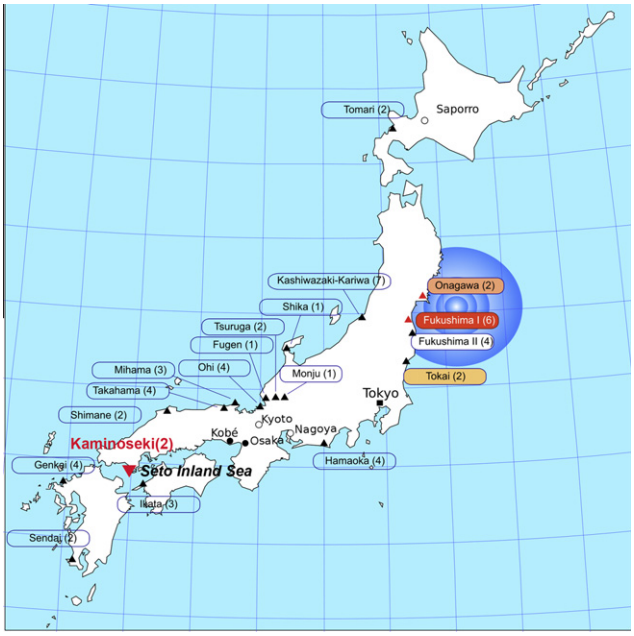

Fig. 1 The Seto Inland Sea of Japan is the widest partially closed water system in East Asia. Nuclear power plants in Japan and the proposed site at Kminoseki in the Seto Island Sea (after Wikicommons).

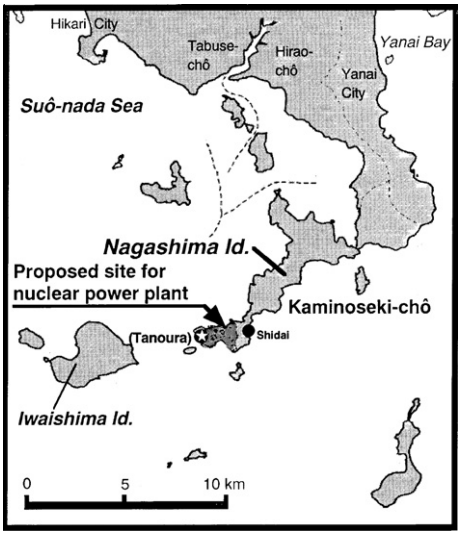

Fig. 2 Kaminoseki Nuclear Power Plant is projected on Nagashima Island, at 3.5 km from Iwaishima Island. Both islands belong to Yamaguchi Prefecture, and are located in the Suo-nada Sea, the western-most part of the Seto Inland Sea.

the sea in a sustainable way, but also have fervently struggled to defend it from this big project supported by the national policy. It will point out that Iwaishima Islanders' stewardship of their environment is a key to a better understanding of their "biocultural diversity," and it will argue that it is the crucial role of academic societies to help the local communities to hand down their environment through generations and to encourage their "biocultural renaissance."[1]

Historically, the name of Iwaishima Island appeared in *Man'yōshū*, the earliest existing anthology of Japanese poetry compiled sometime after 759 AD during the Nara period. It was regarded as an important landmark for the vessels passing the Seto Inland Sea. According to oral traditions, in August 886, a vessel returning to *Imi* village in today's Oita, Kyushu Island was shipwrecked on the shore of Iwaishima Island, and was rescued by the islanders. The vessel owners gifted them with barley seeds and *Kōjin*, a deity for agriculture. The divine dance festival *Kanmai* was started to memorize this encounter and celebrate the introduction of crops in Iwaishima, and they invite priest-dancers from *Imi* Shrine every 4 years (http://www.iwaishima.jp/).

In October 1982, CEPCO announced that Kaminoseki Town, which Iwaishima Island belongs to, is suited for a new nuclear power plant as its second site after the Shimane Nuclear Power Plant. In April 1983, Mr. Hideyuki Katayama was elected as a new mayor of Kaminoseki Town, and declared that he would welcome the project of CEPCO for constructing two 137.3-megawatt nuclear power reactors on the cove of Tanoura in Nagashima Island, just in front of the houses of Iwaishima Islanders. *Shidai* village, having the proposed site in its territory, agreed with the project with the exception of a few villagers; whereas 90% of Iwaishima Islanders were strongly against it. Since then, under economic and political influences of CEPCO, Mr. Katayama promoted the project for 20 years long as the mayor of Kaminoseki Town, and the succeeding mayors have continued his policy. Iwaishima Islanders have continued to demonstrate their non-compliance in spite of the gradual progress of the project favored both by local and national level policies and decisions. Iwaishima Islanders have carried out 1070 walking demonstrations on the island on Mondays, for example.

In 1987, 1 year after the accident at Chernobyl Nuclear Power Plant, "No Nukes Yamaguchi Network" was formed as an association of citizens that were against the projected Kaminoseki Nuclear Power Plant, and members began to collaborate with Iwaishima Islanders and those who lived in Yamaguchi Prefecture. In March 2000, the Ecological Society of Japan made a resolution for the conservation of the proposed site through a more scientific environmental impact assessment, and a local NGO, the Association for the Conservation of Nagashima Island began its activities.

Although the Japanese government accepted the project in July 2001, and the permit for reclamation of the sea was given to CEPCO in 2008, the construction works have been at a standstill owing to the many obstacles facing it, including local landowners who have not agreed to sell their land and a fishing cooperative on nearby Iwaishima Island that has refused to accept compensation for the possible loss of their fishing rights (Asahi Shinbun's Yamaguchi Branch, 2001).

In 2010, two documentary films were made with Iwaishima Islanders: Hitomi Kamanaka's "Ashes to Honey: a search for energy independence in Sweden and Japan" (http://888earth.

[1] The term "biocultural diversity" in this article is defined as a set of plants and animals whose diversity has been maintained by local, indigenous cultural values and behaviors, which, in return, have been dependent on their local biodiversity (Ankei, 2002: 14). Hence, "biocultural renaissance" means the process of empowerment of communities for the conservation of their biocultural diversity and the passing of this heritage to future generations.

net/en/introduction.html) and Aya Hanabusa's "Holy Island" (http://www.hourinoshima.com/english/). These films contributed to propagate understanding and sympathy with the livelihood of Iwaishima Islanders as a background for their struggle against Kaminoseki Nuclear Power Plant Project. After the explosions in Fukushima Daiichi Nuclear Power Plant caused by the earthquake and tsunami on 11th March, 2011 (see Fig. 1), the Ministry of Commerce and industry suspended the construction of new NPPs including Kaminoseki.

In short, the sea of Kaminoseki is one of the most important biodiversity hotspots in Japan, and the role of academic societies to advocate for its conservation is of crucial urgency. This biodiversity hotspot has been preserved thanks to the local communities that have not only used the sea in a sustainable way, but also fervently struggled to defend it from this big project supported by the national policy.

Biodiversity of the Suo-nada Sea and its conservation

The Japanese government enacted the Environmental Impact Assessment Law in June 1999, and the projected Kaminoseki Power Plant is the first nuclear power plant in Japan to which this new law applied. Surprisingly, the Preparatory Report published by CEPCO April 1999 failed to include many of the endangered species. It has been revealed that despite this pollution the biodiversity of the Suo-nada Sea is still exceptionally well conserved, and the Sea around Nagashima Island has the best-conserved shallow water maritime biodiversity in Japan (Ankei, 2003: 83–86; Ankei and Fukuda, 2003: 91–101). In March 2000, Ecological Society of Japan expressed concern regarding the conservation of biodiversity around Nagashima, and demanded a re-assessment (http://www.esj.ne.jp/esj/Activity/2000Kaminoseki.html).

With crystal clear waters over 15 m deep, and 75% of its natural shoreline remaining untouched (average rate of untouched natural shoreline along the Seto Inland Sea is only 21.4%), Nagashima Island, Yamaguchi Prefecture, Japan has miraculously escaped the crisis of rapid economic development. It was first discovered that the projected place for the Kaminoseki Nuclear Power Plant was a biodiversity hotspot, and a local NGO named "The Association for the Conservation of Nagashima Island" started in 1999. Since then, professionals of biological sciences conducted field surveys in collaboration with this NGO. They were all shocked by finding new, rare, or endangered species in the sea around Nagashima Island, where much of its ecosystem thrives as it did 50 years ago (Kato, 2010: 14–17).

Ecological Society of Japan and its lower organizations have submitted a total of eight statements or resolutions (one of them was submitted jointly with the Conservation Committee of the Ornithological Society of Japan and the Conservation Committee of the Japanese Association of Benthology) to Chugoku Electric Power Company and national and municipal governments. The author of the present article has been responsible for writing and editing the revisions for all of the eight resolutions and statements on Kaminoseki NPP by ESJ. In 2010, when Japan became the host state of the 10th meeting of the Conference of the Parties to the Convention on Biological Diversity (CBD COP10, Nagoya), the resolution by ESJ underlined Japan's responsibility for the survival of its biodiversity hotspots, and urged prompt action from Japan and international societies for the Suo-nada Sea, the biodiversity hotspot in the Seto Inland Sea. As a rule, a resolution of ESJ lists up rare and/or endangered species of the area it covers. The species CEPCO failed to mention in its environmental impact assessment of Kaminoseki NPP were: Japanese murrelets (*Synthliboramphus wumizusume*,) peregrine falcons (*Falco peregrinus japonensis*), finless porpoises (*Neophocaena phocaenoides*), lancelets (*Branchiostoma japonicum*), cornirostrid gastropods (*Tomura* sp.), and brachiopods (*Discinisca sparselineata*).

In addition to these species, the following rare bird species have recently been discovered to inhabit and/or breed in the proposed site: Japanese wood pigeons, *Columba janthina janthina* (a government-designated protected species); Japanese murrelets, *Synthliboramphus wumizusume* (government-designated protected species and MoE-listed vulnerable species); murrelets, *S. antiquus* (MoE-listed critically endangered species); and streaked shearwaters, *Calonectris leucomelas* (Yamaguchi Prefecture-designated near-threatened species). Breeding of streaked shearwater populations in inland sea was the first on record (for pictures and more details of these species, see Ankei (ed.), 2012).

The resolution of ESJ adopted on 18th March, 2010 concluded by requesting the following actions:

> "As the host of COP 10, the tenth meeting of the Conference of the Parties to the Convention on Biological Diversity held in Nagoya in October, 2010, the Japanese government should clearly place in its national strategy, and implement adequate measures for the conservation of the Seto Inland Sea, especially around Kaminoseki. It should perform a comprehensive scientific investigation of the Seto Inland Sea with special reference to Kaminoseki.
> Chugoku Electric Power Co., Inc. should suspend all of the construction work related to the proposed site of the Kaminoseki Nuclear Power Plant, and cooperate with impartial research on the maritime biodiversity led by the Ministry of the Environment. Seeing that the proposed site is in the midst of the only biodiversity hotspot remaining in the Seto Inland Sea, it should review the project's feasibility."
> (http://www.esj.ne.jp/esj/Activity/2010Kaminoseki.html)

During CBD COP10 conference in Nagoya, more than a hundred NGO's presented an important statement, and Kaminoseki was especially mentioned in it. Mr. Teppei Dohke of the Japan Civil Network for CBD, and Mr. Ramya Rajagopalan from India of the International Collective in Support of Fishworkers read the statement, and it concluded with the following words:

> "Dear delegates, we want to take the opportunity to highlight an unfolding tragedy. Just days before the opening of this COP, work began on the construction of a Nuclear power plant in Kaminoseki, a coastal area in West Japan. The plant will have a devastating effect on the lives of the communities and on the marine environment. We are in solidarity with the Japanese civil society and their demands. Dear delegates, each of you has the moral and legal duty to implement the CBD, by ensuring rights to dignity and well-being, of present and future generations. Mother Earth

is not for Sale. No to the greed economy. Yes to equity, justice and biodiversity.''
(http://hotspotkaminoseki.soreccha.jp/e145136.html)

Narratives of Iwaishima Islanders and their identity based on the biocultural diversity

In order to make the cultural background for the biodiversity of Kaminoseki, the second part of this paper examines the narratives of Iwaishima Islanders of different generations. Interviews were made in the end of April to the beginning of May 2011, and the question was why and how Iwaishima Islanders have kept the projected nuclear power plant at a halt for 30 years long.

Iwaishima Island is chosen from among many communities in Kaminoseki Town because it has best functioned as a shepherd of their environment than any other communities. Iwaishima Islanders are a group of people most of whom share the basic notion of the way of life in their communal environment, and take responsibility for the benefits of future generations that will enjoy those communal spaces.

Iwaishima Islanders are now playing an important role as pioneers for the development of renewable resources in Japan, and for the pursuit of an alternative future based on such sustainable industry in East Asia free from the threat of nuclear power plant catastrophes.

Since 1984, the municipal government of Kaminoseki has received 4.5 billion yen from the central government as a special subvention for areas welcoming nuclear power plants. Today this subvention for nuclear power plant represents a quarter of its entire budget. It has also received a total of 2.4 billion yen as ''gifts'' from CEPCO. CEPCO paid fishermen 12.5 billion yen as a compensation for their fishing rights, but Iwaishima fishermen refused to receive. Such payment of money in exchange for no work has drastically changed the mentality and economic behaviors of people of Kaminoseki whose inhabitants number as few as 3537 in 2010 (http://www.town.kaminoseki.lg.jp/kaminoseki1.html).

The following narrative is a translation of the defendant statement in the SLAPP lawsuit held on 9th September, 2010 by Mr. Hisao Hashimoto, an Iwaishima fisherman. It explains why fishermen of Iwaishima Island have participated in the movement so positively.

> ''Land filling of Tanoura Bay is a vital question for us fishermen, who rely on the sea as our livelihood. Its reclamation means to intersect our livelihood and life itself handed down for generations from our ancestors. Further, if the Kaminoseki Nuclear Power Plant should begin running, an enormous amount of warm discharge containing chloride will cause the death of the sea around it. We Iwaishima Islanders will have no place to go and will be isolated, in case of accidents happening in nuclear reactors. Constructing nuclear power plants in a half-closed water system like the Seto Island Sea will lead to the total destruction of the natural ecosystem and the livelihood of us fishermen. Since The Chugoku Electric Power Company Inc. (CEPCO) began the work to reclaim Tanoura Bay in September, 2009, we began our daily protest against the work of reclamation, from our fishing vessels at sea. CEPCO was so rude as to tell us that we can never survive if we depended solely on primary industry as fishery. They used their megaphones to identify the name of each fisherman and the name of his fishing boat. They blamed us personally to show that they had already identified each of us. It was an act violating our human rights. In spite of such inhuman deeds, we have continued our non-violent actions to express our opinions. Since 1982, from the very beginning of Kaminoseki Nuclear Power Plant Project, we have continued to say ''NO!'' to the project based on our fair judgement and reasoning. In order to fight against us, CEPCO has provided a tremendous sum of money to influence local communities and government, and has misused their compelling powers to the end of destroying human ties that had existed before, and hence has pressed our daily life. Thus, they have brought us incalculable damage and impoverishment to our daily life. What we have done is to continue to protest against CEPCO who have continued their unfair trials to harass our life style. I believed it is illegal of CEPCO to ask us in a lawsuit to compensate its loss. They are simply pursuing this to get profits from the project. I, with the other three defendants, have done nothing that someone should ask us any compensation for. I am proud of the Sea of Kaminoseki where I was born. Nuclear Power Plant and this beautiful sea of lives can never coexist. I have the right to live peacefully on Iwaishima Island, and to continue to maintain my life through fishing activities. We fishermen have the responsibility to conserve the Sea and to hand it down to future generations; CEPCO does not have rights to invade our life and the Sea of lives by urging local inhabitants with their powers. We are convinced to continue our non-violent, just activities against Kaminoseki Nuclear Power Plant Project until CEPCO abandons this project.''
> (http://hotspotkaminoseki.soreccha.jp/c6772.html)

The following is a narrative of an old Iwaishima Islander, who was one of the earliest to begin saying no to this big project, and have continued their movement for almost three decades.

Mr. Ichio Isobe, aged 87, explained that Iwaishima have traditionally worked outside the island during low seasons for fishing or agricultural activities, and there were as many as a hundred *Toji*, specialists of *sake* brewery, each of whom accompanied 3–5 assistants to make a team. There were also those who emigrated in today's Sakhalin, Hawaii and North America in his father's generation. He himself experienced working as a brewing assistant, coal miner, and petroleum industry engineer. In 1975, Mr. Isobe was advised to work in the Fukushima Daiichi NPP. About a dozen Iwaishima men worked in periodic inspection and replacement of its second reactor, but he attended it for only 2 months. Mr. Isobe worked in a highly radioactive area, and witnessed that cleansing water and wooden scaffolding contaminated with radioactivity were released into the environment as they were. Seven of these Iwaishima workers developed cancer and eventually died from it. Mr. Isobe and other survivors became strong opponents against the proposed Kaminoseki Nuclear Power Plant, when it was explained that it would be safe and the best choice for community development. Thus, Iwaishima Islanders have had a channel to get information on what is going on in their outside world, although they may seem to reject the project from a perspective of ''NIMBY'' and insularity.

Mr. Choichi Ujimoto, aged 61, returned from Hokkaido 3 years ago. His father belonged to the island's minority (about 10% only) that have welcomed the projected Kaminoseki Nuclear Plant, and he refused to come home mainly because of this reason, he says. Instead, he continued to work as a manager of a cattle farm in Hokkaido of a size bigger than the entire Iwaishima Island. After the death of his father, he returned home, and began exploring a way that Iwaishima Islanders could sustain their living without directly depending on the money associated with big projects like a nuclear power plant. He lets pigs to graze in terraced paddy fields, abandoned and covered with thick vegetation, and feeds them with waste from the islanders' kitchens. His pig project resulted in cleared fields ready for cultivation, and top quality organic meat and guts purchased by a French restaurant in Tokyo for twice the market price. He underlines the wisdom of Iwaishima Island that they use a minimum of cash inside the community. In their daily life, they exchange goods and services on the basis of gifts and general reciprocity, so that differences in their cash income do not become obstacles for egalitarian human relationships on the island. According to him, attending the *Kanmai* Festival held every 4 years is a fundamental obligation for all Iwaishima Islanders, including those who usually live outside the island. Everybody plays a different role in the preparation and performance of the divine festival, thus enforcing the ties of the island community. If one should be absent from *Kanmai*, people might suspect that something very shameful has happened to keep him or her from attending it. This four-year cycle of *Kanmai* urges the islanders to maintain their living on a longer prospect than usual, to the end that their economic activities are rendered to be steadier. According to Mr. Ujimoto, the community was at the risk of collapse when *Kanmai* could not be held on two consecutive times (1984 and 1988) because of sharply opposing opinions for and against the projected Kaminoseki Nuclear Power Plant. This may partly explain how Iwaishima Fishermen's Cooperative (now a branch of Yamaguchi FC) has refused to receive a compensation of about one billion yen in exchange for fishing rights.

Mr. Takashi Yamato, aged 34, returned to Iwaishima 11 years ago, and is actually the youngest activist of the anti-nuclear movement of this island. He earns his living by marketing local produce through the Internet: he deals with loquat fruit and its leaf tea, dried brown algae *hijiki*, dried octopus, and so on prepared by members of the community. He also trains young volunteers from outside the island how to plant vegetables for self-sufficiency. He admits that conservation of biodiversity and ecotourism might not be a sufficient alternative for a nuclear power plant. But if only the uncontaminated ecosystem continues to be preserved, it will be enough to sustain the island's quality of life with its high quality produce, he says.

These narratives show us that what happened in the recent history of Iwaishima Island may be called a cultural survival and renaissance especially in the case of *Kanmai* as told by Mr. Ujimoto. *Kanmai* is said to have a history longer than 1000 years, and their new alternative project explained below is called a "1000 Year Project of Iwaishima Island for future."

Prospects

In January 2011, Iwaishima Islanders started a new plan to change the island to become 100% self-sufficient with renewable energy resources, and they are now calling for participation and financial support from all over Japan (http://www.iwai100.jp/organization.html). Although it has not influenced the majority of Kaminoseki Town, nuclear energy in Japan has been in a distinct decline since the catastrophes of Fukushima Daiichi NPP since March 2011. On 5th May, 2012, all the nuclear power plants in Japan stopped operating, and as of November 2012, only two reactors are active out of its total of 50 remaining reactors. The disasters going on in Fukushima and in northern Japan have gradually revealed both human and mechanical vulnerability in spite of the government's effort to make believe that they can handle the matter. Even the majority of Kaminoseki residents, who anticipated much more income with the construction of nuclear power reactors, now wonder if the project will be continued or stopped. The time has come when the silent majority of Kaminoseki people and the scholars in academia listen to the voices of Iwaishima Islanders and realize the value of the biocultural diversity in their bioregion.

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