

Assemblage Thinking and Fisheries Geography:
A Retrospective of Fisheries Geography in Japan and Water World Studies
in Anglophone Human Geography

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I Preface

In this paper, fisheries research in Japanese geography is compared with marine research in anglophone human geography to examine the characteristics of each method. First, the history of fisheries research in Japanese geography since World War II is summarized. Second, the characteristics of marine geography research are examined based on the assemblage perspective that has emerged in anglophone human geography in recent years. Finally, the paper discusses how this research trend can be applied to fishery studies in geography.

Fisheries research in Japanese geography has a long history. *Gyoson Suisan Chirigaku Kenkyu (Geographical Studies of Fishing Villages)* by Aono (1953) is a representative work. In this book, Aono described the settlement patterns, production styles, and seafood distribution structure in fishing villages in Japan. This work showed that fisheries research in geography has been defined by the terrestrial region, rather than the water, as the main area of investigation. Aono suggested that this was due to research by fisheries scientists being mostly fishing grounds-oriented, while work on fishing villages has been conducted by geographers, economists, jurists, and ethnographers. Fisheries scientists have access to test vessels and are in a position to conduct oceanographic and biological research on fishing grounds, while others do not have this access and concentrate on studying fishing villages. Under these circumstances, geographers take a fishing village-oriented position (Aono, 1953: 2-3).

Aono used surveys in the terrestrial field due to these constraints. Subsequent geographers have used the same methods, and as a result, research on fishing

villages was dominant in fisheries geography in Japan until the 1980s (e.g., Kakimoto, 1975)¹⁾. However, geographers who study fishing villages have not ignored the importance of activities related to production that occur on the water. Geographer Yoshihiko Yabuuchi wrote the following in his main work *Gyoson no Seitai* (Ecology of Fishing Villages) (Yabuuchi, 1958: 18): “The natural environment of a fishing village, that is, the nature of its waters, affects its labor force, means of labor, and objects of labor, and these are also affected by the social environment. If the natural and social environments are viewed as the locational environment of the fishing village, the relationship between the environment and production can be understood in a fundamentally correct manner”. Thus, Yabuuchi recognized that fishing is established by a combination of the natural environment on the water and the socioeconomic environment that develops mainly on the land. However, as Aono stated, development of research methods is a challenge and the activities of fishers on the water have not been sufficiently studied.

In the 1980s, a new survey method was introduced to geography, based on methods in ecological anthropology. According to Masataka Tawa, the main characteristic of this method is “direct participation in fishing activities to obtain data through observation, measurement, and survey, while focusing on the relationship between fishing grounds and fishing activities” (Tawa, 1997: 14). Since its adoption, Japanese fisheries geographers have studied fisheries activities on the water. In the next section, I will first summarize the background of the introduction of ecological methods and then examine the characteristics of studies that have been performed based on these methods.

II Characteristics of ecological methods in fishery geography in Japan

1. Fisher’s behavior studies in Japanese geography

As cultural geography in the United States developed its methodology under the influence of anthropology (Mikesell, 1977; Kobayashi, 1987), fisheries geography in Japan was also influenced by anthropology in development of survey methods. In particular, ecological anthropological studies of fishing activities that started in the 1970s greatly influenced works of fisheries geography (Maeda, 2019). In the 1970s, Japanese ecological anthropologists investigated the activities of hunters,

gatherers, and fishers in various areas to examine human-environment relationships. Several small-scale fisheries in Japan were also investigated (Harako, 1972; Akimichi, 1978) and maps were frequently used as a tool to describe the activities of fishers in these studies. For example, Irimoto (1977) utilized maps to represent the seasonal changes in collecting behavior of fishers in the reef zone. The fishermen's behavior was visualized and readers were able to capture their space use more realistically. In this regard, a geographer similarly maps human behavior in behavioral geography. Thus, there was a high affinity between ecological anthropology and geography in the way the data were presented.

In Japanese fisheries geography, the study of fishing activities on the water began with Tawa (1981), based on proposed use of fishing grounds by longline fishers in Mukuna, Ehime Prefecture, Japan. In the field he observed movement of fishing boats from high ground and measured the duration of fishing activities, along with participatory observation with fishers. Tawa emphasized first-hand data collection, as in ecological anthropology, and spatially represented the collected data using charts and maps. Later, this survey method was also used to reveal the use of fishing grounds for single-trawl fishing (Tawa 1983). These case studies permitted identification of factors influencing fishing activities on the water and mechanisms of fishers' behaviors (Tawa 1984). Since this pioneering work, other geographers have investigated fishing activities on the water. For example, Ikeguchi (2001) used participant observation to determine the detailed use of fishing grounds by the ama fishery in Wagu, Mie Prefecture, Japan; and Maeda (2020) used the time allocation method (Suda 1994) to analyze the natural and socioeconomic factors that influence fishers' activities.

Methods of collecting activity data without direct observation by the investigator have also been employed. Nakamura (2002a, 2002b) used fishing vessel logs in studies of offshore fishing activities that could not be observed from the shore, while other studies have investigated daily movements of fishing vessels using GPS devices (Yoshimura 2016) and logbooks written by fishers (Hashimoto 2015). With the advent of new research methods, previous activities and activities far from shore that cannot be directly observed by researchers can now be examined.

2. Problems in fisheries geography in Japan

Fisheries geography has developed uniquely, but there are problems studying fisheries activities in bodies of water. One problem is that the term “nature” only abstractly defines the natural environment of the fishing grounds. If we consider nature in the sense of “something other than humans”, there are countless “natural” things in the water world. Examples include living organisms such as fish, seaweed and plankton, and inanimate objects such as water molecules, sodium, seafloor topography, and waves. Thus, the water is a collection of countless elements with different properties (Bear 2017). Fishermen’s activities unfold in the intertwining of these elements with fishing.

Each of the elements of water can have a diverse relationship with fishers. Relationships of fish and fishers, such as “catch - to be caught” and “eat - to be eaten” are formed; and fishers can also relate to inanimate objects. For example, relationships of fishers with the seafloor topography are established through the act of envisioning where to set up fishing gear and checking the topography to avoid running aground. Diverse nature is practiced through relationships with humans (Hinchliff, 2007). However, a researcher’s knowledge is limited and cannot capture everything. Under these limitations, studies have focused on the correspondence between fishers and specific “nature” by narrowing down their targets, such as the effects of wind and seafloor topography on fishing activities. Complex relationships that originally formed between multiple elements like a mesh are presented in a neatly organized manner.

These methodologies are of value and have revealed a wealth of ecological knowledge, including tacit knowledge (Polanyi, 2003), possessed by fishers. Alternative forms of spatial use that are not landlocked (Lambert et. al., 2006: 480) have been shown by depicting the reality of activities on the water, which cannot be fully revealed through terrestrial research alone. However, the behavioral patterns of fishers cannot be simplified in the context of the diverse and complex relationships of elements (Anderson et al. 2012). If we define the water world related to fishing as the fishery space, fishers themselves are one of the elements that make up the space. In this space, forms of fishing ground uses created as relationships with surrounding elements are made or broken.

A new perspective of spaces is required that is effective in viewing the water

world, including oceans, lakes and rivers, as a gathering of diverse elements. It is important not to simplify the mechanisms of fishing activities by lumping together diverse natural elements in the sea as “nature” (e.g., Howarth et al. 2014). Rather, the relationships among elements through which the activities are generated should be addressed, and connections among the underlying elements should be carefully described. The next section introduces studies in anglophone human geography that focus on assemblage. These studies are now providing an important perspective on the geography of fisheries.

III Assemblages of water worlds and current studies of geography of the sea in anglophone geography

I. What are assemblages?

In the 2010s, the assemblage referred to by Gilles Deleuze in “A Thousand Plateaux” (Deleuze, 1994) was introduced into geography. Geography focuses on the world of space/time, in which heterogeneous elements are brought together (e.g. Massey, 2005). Real space changes over time and the cohesion of heterogeneous elements is always open to instability (Massey, 2005). To understand the elusiveness of such spaces, concepts of assemblage have been applied in geography in recent years (Anderson et al, 2012). According to Bennet (2010: 23-24), “assemblages are ad hoc groupings of diverse elements, of vibrant materials of all sorts” (Bennet, 2010: 23). “[T]hey include humans and their (social, legal, linguistic) constructions, also include some very active and powerful nonhumans: electrons, trees, wind, fire, electromagnetic fields” (Bennet, 2010: 24). In other words, based on assemblage thinking, space is a mixed construct of humans and things. Bennet argues, however, that “no one materiality or type of material has sufficient competence to determine consistently the trajectory or impact of the group” in an assemblage (Bennet, 2010: 24).

While Bennet advocates a vital materialism and emphasizes the agency of objects, power in such collectives is not concentrated on specific people or objects. The effects of various elements are only “slowly brought to light as the assemblage stabilizes itself through the mutual accommodation of its heterogeneous components” (DeLanda, 2002: 144). In other words, when we grasp the way in which mul-

multiple people and things gather through the terminology of an “assemblage,” we do not consider any single thing or person to be responsible for the occurrence of a certain event. Rather, we first seek the locus of responsibilities for various events in the assemblage of humans and non-humans itself. Then, we turn our attention to the influence of individual elements and the relationships among them.

Regarding the significance of applying assemblage thinking in geography, Allen (2011: 154) argues that there is a “possibility that heterogeneous elements can hold together without actually forming a coherent whole”. When multiple elements are assembled in a particular space, there is not necessarily a strong coherence between them. There may also be relationships among the elements that “cannot be observed, but are actually occurring” (Shinohara 2015: 227). Assemblage thinking is effective when it depicts the emergence of networks among these elements, as well as the fragility and tentativeness of the relationships among the elements themselves and the spaces that result from them (Anderson and McFarlane, 2011).

2. Application of assemblages to the geography of water bodies

In this section, I will examine the characteristics of geographical studies of fisheries that apply assemblage thinking. “[C]ontemporary geographical enquiries of the sea are increasingly relational” (Spence, 2014: 203). In particular, studies focusing on fisheries are prominent in presenting the entanglement of humans and non-humans in the sea through a critical examination of fisheries management systems. Resource management systems based on spatial affairs, such as development of Marine Protected Areas, are being implemented worldwide. However, the institutionalized zoning of fishing space is not always in line with the customs and culture of coastal communities and the ecology of aquatic organisms. Fishing spaces contain “a collection of habitats, natural processes, multi-stakeholder practices, and use rights that are tied to places” (St. Martin and Hall-Arber, 2008: 779). Nevertheless, resource management systems are formulated in a linear fashion that delimits fishing space and ignores such an assemblage. These policy trends are critiqued by geographers, who address the networks and fluidity among the elements that characterize the geography of the sea.

Bear and Eden (2008) critically examined the resource management policies involved in Marine Stewardship Council (MSC) certification. The regulations must

include the gear that can be used, the hours of activity, and the species of fish that can be caught. However, organisms and seawater move freely beyond the lines demarcated by humans. The fluidity of water easily nullifies a linear network of demarcation and management. In other words, the physical environment of the sea and the ecology of aquatic life make standardization of space through institutions difficult. Because fisheries operate in waters as a heterogeneous assemblage of elements, the workings of non-human elements must also be considered in the operation of resource management systems (Bear, 2017). Fishers themselves, who are active on the water, are one of the components. Therefore, fishing activities are formed in the context of relationships with other components. In this context, both humans and non-humans exercise their subjectivity. Moreover, the connections between elements are constantly changing in the materially fluid sea (Steinberg and Peters, 2015a, 2015b). Fishers must act according to the variability of the various elements that surround them and the unstable relationships between them.

In understanding the geographies of water worlds as unstable space, it is useful to use assemblage thinking, which attempts to capture the cohesion and vulnerability among elements through focusing on the changes and potential for ruptures of relationships between actants. As a result, it is possible to identify “how the resulting conflicts and reconciliations affect human environment relations” (Wiber and Barnett, 2021: 4). Furthermore, assemblage thinking promotes attention to actors (water molecules, plankton, water flow, depth) that are often overlooked in terrestrial-centered geography and assesses their ability to create specific spaces (Fairbanks et al, 2018). This methodology, which carefully depicts the role of the whole aggregate (human, nonhuman, inanimate, etc.) and its individual components, advances both theoretical and empirical research in fisheries geography.

3. Perspectives of “ocean exceeded”

The study of the geography of water worlds based on the assemblage view presents an alternative perspective of space that differs from that of the terrestrial view. However, we cannot explain phenomena that occur in the sea by observing only sea, lake and river space. Fishers mainly dwell on land, and the institution of fishing space is also created on land. To analyze phenomena in the sea, it is necessary to use an analytical perspective that straddles sea and land.

This view was introduced by Peter and Steinberg (2019) and Bear (2019), who argue that the ocean is “extensive metaphysically” (Peter and Steinberg, 2019: 295). Specifically, the ocean is materially transformed into seawater, rainwater, river water, etc., and moves between water and land. In this process, some fresh water is taken into the bodies of animals and plants. The sea also influences people’s sensibilities and memories, as described in novels, poems, and diaries. Therefore, materially and immaterially, the ocean “becomes embodied, internalizing itself within the subjects that constitute the marine environment” (Peters and Steinberg, 2019: 298). From this perspective, not only the elements in the ocean, but also those present on land, are incorporated as part of the assemblage.

I would like to focus here on eating fish. Fish swim in bodies of water before they are caught and incorporated into the human body. When fish are caught by fishers and anglers, most are landed and eaten on land. Fish cross spaces through the intervention of humans and birds. “[F]ish extend beyond the ocean and they are potentially central to the ocean in excess” (Bear, 2019: 330). Probyn (2016) stated in *Eating the ocean* that marine ecosystems and economies cannot be simplified (i.e. Howarth et al, 2014). Thus, the human-fish relationship does not converge only in a simple “catch - be caught”. Rather, the relationship changes according to natural conditions such as topography and currents, as well as socioeconomic conditions such as fishing methods and markets. Therefore, “fish as food is in the middle of the complex entanglement” of natural environment, industry, history, trade, etc. (Probyn, 2016: 5). Probyn concurs with Abrahamsson et al. (2015), arguing that “fish is not fish itself” (Probyn, 2016: 52). Fish can survive only in the presence of water, plankton, and nutrients; and to be distributed as a commodity, fish must be connected to fishers, distribution networks, and fishing ports. Thus, fish are provided to consumers through connections with various elements in both water and land. The reality of fisher’s behaviors cannot be captured within the spatial limitation of a body of water, and they should be located on a variety of scales. Therefore, I believe that the basic stance of fisheries geography should be to carefully trace the relationships among human and non-human elements surrounding fishers.

IV Conclusion

This paper has examined the relationship between the geography of fisheries in Japan and water world studies in anglophone human geography based on the assemblage perspective. Application of assemblages to the geography of the water world enables consideration of the connection of various elements within water and across the boundaries between the terrestrial and water worlds.

Formation of a particular fishing activity is linked to various elements surrounding fishers and organisms. The first step in research is to trace the relationships among these elements. In Japanese fisheries geography, which is derived from ecological anthropology, fieldwork has been used as a research method. In this work, the economic problems of fishing areas were necessarily linked to social environment and large-scale policies. Yamauchi (2005: 257) praised such empirical research methods as being able to “examine extensively the characteristics of management organizations found in a fishing village and their relationship to geographically defined employment opportunities, social ties within the village, and the fishing ground environment, including the fishing system, in order to derive high explanatory principles”.

Fisheries geography in Japan has been suggested to lack a thriving epistemological and methodological debate (Yoshida 2019). However, I think that by incorporating theoretical studies from anglophone human geography and using research from fishery geography in Japan that has been accumulated since the 1980s, it is possible to explain the spatial use patterns of fishery activities. This will lead to presentation of an alternative perspective to that in terrestrial-centered geography. The geography of the water world, with its fluid and unstable spatial characteristics, is a realm in which a new spatial epistemology for geography can be proposed.

Notes

- 1) In geography in Japan, the term “fisheries geography” (*Gyogyo chirigaku*) has taken hold. fishery geography or geography of fisheries.

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