The Relationship between Fishing Grounds and Locality of Fishing Ports - An Example of Saury Pike Fishing in Tohoku District

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The Relationship between Fishing Grounds and Locality of Fishing Ports
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1 Introduction

In geography of fishery, main subjects are composed of three elements, namely fishing grounds, fishing ports and fish markets. Among these elements, a fishing port usually functions as a nodal point between fishing ground and fish market, or in other words output of fishery and consumption. These elements are closely related one another. Therefore, large or small catch in fishing grounds influences the supply to the fish market, but on the other hand fluctuations of demand at fish markets have various influences on the catch.

In order to study the geography of fishery, it is necessary to analyze these three elements separately, but it is important to recognize the functional relations among them. However, the functional relations of these elements are dynamic, so it is difficult to understand the situation because of the instability of catches and the need for shipment of the perishable item to fish market.

Concerning the relationship between fishing grounds and fishing ports among the above-mentioned elements, the writer tries to analyze the catch according to the migration of fishing grounds. There are few papers regarding the relationship in fishery science and other related fields which are mainly studies on biological or marine conditions of the fishing grounds. But in the geography of fishery, the study of the fishing grounds concerning the catches hitherto, have been limited to small areas and to periods before the appearance of powered boats.

The writer has analyzed the relationship between fishing grounds and localities of fishing ports with data of catches and the migration of the fishing grounds. From different point of view, in this paper he mainly tries to explain why the fishing boats registered at ports in Tohoku district choose their landing ports in accordance with the migration of fishing grounds. That is to say, when large schools of saury pikes are often formed in a short time, the catch exceeds the capacity of boats, and the boats must return to ports swiftly to land the catch.

The studying area is the Pacific coast of Tohoku district including Iwate, Miyagi and Fukushima prefectures. The data were obtained from Tohoku Regional Fisheries Laboratory and Saury Pike Fishing Association of Japan.
2 The migration of fishing ground in 1965 and 1966

The fishing grounds of saury pikes were scattered in September, 1965. In 1966, however, there was a core area of fishing ground at 42° N and 148° E, extending to east and west. From this area, the fishing grounds migrated to the southwest in the last decade of September. In October, the fishing grounds approached the coastal area in both years. The core area in 1965 was situated in a very small area off the port of Ofunato in the southern part of Iwate prefecture. In 1966, there were two core area of fishing grounds on both sides of the meridian of 145° E, due to the marine conditions of Kuroshio Branch.

In the last decade of November, they migrated to the south along the coast and extended over a large sea area, however they did not last long. (Fig. 1-a, b)

3 Distributional patterns of landing at each port

According to the data of 1965, three types were classified in regard to the distribution of landing at each port in Tohoku district, divided into every ten days, as is shown in Fig. 2.

The first type is such that shows a normal distribution with one peak in the middle of the season. The second type is largely the same as the first but with two peaks, and the third type is asymmetric (Fig. 2). Three ports in the north of Iwate prefecture belong to the third type, while the ports from the southern part of Iwate to northern part of Miyagi prefecture belong to the first type, and the second type is seen in ports from the southern part of Miyagi to Fukushima prefecture.
In 1966, distributional pattern was almost entirely the second type. This means that during the fishing season there were two large catch influxes in the early and the late decade of October. But after November, the catch declined due to disappearance of fishing grounds for a short time.

In 1966, the number of boats engaged in this fishery amounted to 250 in the three prefectures in Tohoku district. These boats consisted 28% of all boats in
operation, and yielded 40% of total catch. The boats which landed more than half of their catch at their ports of registry in Tohoku were 86% of the whole, but in Miyagi prefecture, this rate falls to 52%. Especially at port of Shiogama, this rate is lower. This is not only because Shiogama is farther from fishing grounds, but also because this port has been characterized as a trading center of more expensive fish such as tunas and bonitos rather than inexpensive saury pikes.

In Fukushima prefecture, only 13 boats landed more than half of catch to ports of their registry. That is to say, during the latter half of fishing season, the fishing grounds were not off the shore of this prefecture in November. The ports in Miyagi and Iwate prefectures were in a short distance to the fishing grounds, so that they were more favorable for boats which used them as ports of registry.

Small-scale fishing ports adjacent to large-scale ones are often used only by boats which use them as port of registry. Generally speaking, many boats tend to land their catch at their ports of registry excepting the ports in Fukushima prefecture. Among all ports in Tohoku district, Kesennuma has the most favorable situation in respect to the location of fishing grounds and capacity of fishing processing function. However, according to migrations of fishing grounds, boats change landing ports in various ways through fishing seasons.

4 The relationships between landing ports and ports of registry

The ways of selection of landing ports are classified as follow; 1) The type in which the boats mostly land the catch at their own ports of registry.

This type includes small-scale ports in northern Iwate prefecture such as Yamada, Ozuchi and Hosoura, but not Miyako (Fig. 3). The size of boats which use these ports are usually small in tonnage. These boats scarcely land the catch to ports which is located to the south of Port of Kesennuma. This is also true to boats registered at ports in Miyagi prefecture.

A fish market in a small-scale port is ordinarily managed by fishermen’s cooperative association, and not by wholesale dealers. Many fishermen operating small boats using these ports as their base are also members of this association. In order to maintain the market, they need to land the catch to such small ports and also them as base.

2) The type in which the boats land little portion of the catch at their ports of registry

The main reasons are the following two. a) Some of the small ports have no fish market, and the boats whose bases are such ports, are compelled to land the catch at other ports equipped with fish markets. Ports of Hirota and Kesen in the southern part of Iwate prefecture, or Ogachi in Miyagi prefecture are good examples of this kind (Fig. 3). b) Ports in Fukushima and Aomori prefectures
are far from fishing grounds at high fishing season. So the boats registered at these ports have to land the catch at other ports in other prefectures. In this case, some boats keep landing the catch always at the same port, while other boats change landing ports in accordance with the migration of fishing grounds.

5 The distribution of the catch and the boats concerning four ports of registry

For 1966, the writer tries to explain the location of fishing grounds from which the boats return to land the catch to ports of registry. These relations were investigated concerning the following four ports: Kamaishi, Kesennuma and Ishinomaki, Shiogama. Fishermen are legally required to keep records of the places of catch and landing ports, such records were used to draw the Figures 4, 5, 6 and 7. For each of the ports of registry the number of operating ships and catch in fishing grounds are dotted, and that isopleths of the catch and the ships are drawn on 50×50 km² quadrates. The location of core area of the fishing
ground, from which the catch is mainly landed at Kamaishi, resembles the fishing grounds at the end of October as shown in Fig. 4-a. (Fig. 4-a)

As to Kesennuma, the location of core area of the fishing ground was at 39° N and 142.5° E resembles the fishing ground in the last decade of October as is shown
in Fig. 1-b. This sea area with good catch stretched from the core area of the fishing grounds south-westward to the coast. (Fig. 5-a)

Concerning Ishinomaki, the core area of the fishing grounds is similar to the location of fishing grounds of Kesennuma (Fig. 6-a), but the distribution of boats
which landed the catch at this port is dissimilar to the example of Kesennuma (Fig. 6-b). The location of the core area of fishing ground concerning Shiogama corresponds to the fishing ground at the end of October or in the middle to end of November. These two fishing periods with large catch form a symmetric pattern of catch with two peaks. But the fishing grounds extended north and south as these examples of Kesennuma show (Fig. 7-a).

In brief, the core area of fishing grounds for boats using Kamaishi was in the northernmost, and that of Shiogama was most to the south. The arrangement of the core area of fishing grounds concerning each port of registry is similar to that of the localities of fishing ports. The shortest distance from each core area of fishing ground to each port, is 92 km in the case of Kamaishi, and respectively 75 km, 137 km, and 173 km concerning the Kesennuma, Ishinomaki and Shiogama, as was already described, Kesennuma is located nearest to fishing grounds among four ports.

The writer assumes that more than half of each fishing grounds is covered within 100 km from each port respectively, but in the case of Shiogama the circle with the same sphere covers only less than a tenth of it. So the boats with this port as the port of registry do not always land the catch to Shiogama due to the longest distance from fishing ground. This fact reduced the landing of this port. However, concerning each port except Shiogama, locations where boats carry on fishing do not always coincide with the core areas of fishing grounds. In other words, a number of boats did not operate in sea area where there were large schools of fish.

In order to discuss this fact, it is convenient to divide the fishing season into three stages. The first stage is from the start of fishing till the first decade of September, and the second stage which shares 25% in total landing continues to the last of October, and the third stage continues till December when the season ends. In the first stage, the catch landed at Port of Kamaishi was carried from two fishing grounds. But in the second stage fishing ground extended over large area, and on the whole the location of fishing ground from where the catch was shipped to this port was situated most to the north among four ports. Concerning this port, fishing ground with large catch did last through all stages of fishing seasons. However, the catch landed to Kesennuma was carried from comparatively narrow grounds in the first stage, and the core area of fishing grounds in the second stage was located in area where a number of fishing grounds appeared in many times through the fishing season.

The core area of fishing ground from where the catch was shipped to Ishinomaki was in 42° N and 148.5° E in the first stage. In the second stage the locality was similar to that of Kesennuma. In the case of Shiogama, the core area of the
fishing ground in the first stage was similar to that of Ishinomaki, and to that of Kamaishi in the second stage. Therefore, in this stage, the fishing grounds missed distinct core areas. In addition to large catch in the last decade of November and in this stage, the distribution of catch to be landed at this port would be a symmetric type with two peaks.

It seems that the location of the fishing ground from where the catch was shipped to Port of Kesennuma and Ishinomaki differed from one which shipped comparatively small catch to Kamaishi and Shiogama. In respect to the distance from the core area of each fishing ground to port, every port is more favorably located than any other port. Among four ports, Kesennuma particularly has the most favorable locality in relation to fishing ground.

As mentioned above, the selection of landing port for boats is not only explained by higher prices at fish markets, but is seemingly attributed to the distance from fishing ground. These locational relationships of fishing grounds and ports are based on the characteristic of saury pike fishing, in which it is necessary to land the fish in a short time, and also the existence of numerous fishing ports on the Pacific coast of Tohoku district.

References (* in Japanese)


