Ecology of the Nasake Fishermen (Progress Report) The Temporal and Spatial Structure of their Activity System as Revealed by an Individual-Tracing Method

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Abstract It is hoped that human life or activity will be studied from an ecological point of view. This paper is based on the data obtained in ecological field surveys in a fishing village of the Nasake Island, the Seto Inland Sea, Japan. The Nasake fishermen work every day on the sea near their settlements, specializing in the hand-line fishing (*ippon-tsuri*).

Main concerns of paper are descriptions and discussions about the people's system of activity (especially subsistence activities) in terms of its temporal structure, spatial structure, their correlations, the relationships between men's activities and women's activities, and so on. From our methodological point of view, the temporal and spatial structure is regarded as a primary expression of human activity system.

INTRODUCTION

It is very important to observe and to describe the human life or activity from an ecological point of view. In our methodology, the temporal and spatial structure is regarded as a primary expression of the human activity system (cf. WATANABE 1964). And we analyze the structure and consider why it has been originated and how it has influenced human body and/or life. But we know that the factors relevant to these processes are so numerous and variable that it is very difficult to explain all of them at once and that still more no factors are independent. It is hoped that this

paper will be the first step to develop the study mentioned above.

The paper is based on the field works in the Nasake Island (Map 1), the Seto Inland Sea, which were carried out for about 1 week in July and about 4 weeks in August, 1968. Some explanations must be given on the choice of this study area, because success in an ecological field study depends on the choice of the aimed area or human group to be investigated.

The area for this survey was chosen from the fishing village.* It may be

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* Japanese fishing village was defined by YABUCHI (1965) as a social group forming a fishing co-operative association and living

Map 1. The location of the study area
(indicated by the arrow mark)

approved that the cycle of fishing activity is completed in a shorter time than that of farming activity, so that we can analyze the human activity system more easily. More detailed standards for the choice of the study area are listed below;

- 1) The population size is not so big.
- 2) The population is relatively isolated.
- 3) The mode of work is neither so modernized nor so developed that the correlation between work and natural environment is relatively easier to be observed.
- 4) The population consists of various age-classes.
- 5) Individuals in the population usually work independently.
- 6) The socio-cultural environments of all persons are relatively homogeneous.
- 7) All persons (fishermen) are engaged in one and the same type of fishing.
- 8) Forces external to the population do not disturb their original lives so much.

Considering the above mentioned standards, it may be reasonable to think that the fishing village of the following type is suitable for this study:

- 1) Form of fishing village: "pure" fishing village (*jun-gyoson*).
- 2) Economical system: fishing village of simple production of goods.*
- 3) Method of fishing: hand-line fishing (*ippon-tsuri*) (NORBECK, 1954).

According to my opinion, the Nasake Island is one of the most suitable fishing

villages for the study of ours. The opinion was derived from our general surveys of many Japanese fishing villages.

GEOGRAPHY, POPULATION AND HISTORICAL BACKGROUNDS OF THE NASAKE ISLAND

The Nasake Island is one of the archipelagos in the Seto Inland sea, belonging to Oshima District, Yamaguchi Pref. It is located eastward to the Oshima Island and approximately 5 kilometers in circumference. The climate of the island is shown in Table 1. Woody hills overspread the island, except for the settlement zones and the fields. The height of the highest hill is 148 meters above the sea level. There are 4 settlements in the island, all of which are situated facing inlets on the eastern side of the island.

The settlements are surrounded by many good fishing grounds (*ajiro*): distances between the fishing grounds and the settlements vary from about 0.3 to 4 kilometers. The tide-flow in the surrounding sea is very strong, especially

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* ONUMA (1957) divided Japanese fishing villages into the following 5 categories on the basis of the developmental stage of their economical system.

- 1) Fishing village based on natural economy
- 2) Fishing village based on simple production of goods
- 3) Fishing village, in which capitalistic production begins to emerge
- 4) Fishing port, in which capitalistic production is dominant
- 5) Big fishing port

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their lives in main relation to fishing.

Table 1. Meteorological records at Ageno-shô

	Maximum Temperature(C°)	Minimum Temperature(C°)	of sunshine Duration(hrs.)	Precipitation(mm)
Jan.	9.8	1.0	131.2	65.9
Feb.	10.9	1.6	130.9	73.1
Mar.	13.7	4.1	172.5	125.2
Apl.	18.3	9.0	168.0	217.3
May	22.1	12.9	177.5	217.3
Jun.	25.2	17.1	151.1	291.1
Jul.	29.4	21.8	185.8	214.2
Aug.	29.9	22.9	213.0	115.8
Sep.	27.6	20.0	163.7	231.4
Oct.	22.6	14.4	169.7	151.6
Nov.	18.0	9.3	154.6	97.0
Dec.	12.9	3.7	144.5	43.9

Agenoshô is located in the southern part of the Ôshima Island.

A meteorological station at Agenoshô Town, which is the nearest one to the Nasake Island.

on the Moro-shima Strait and the Kushi-no-seto Strait, in comparison with other areas of the inland seas. The speed is about 8 kilometers per hour (average at the strongest period of the major tide (*o-shio*)).

The agriculture in the island is very unflourished and is not important for the economy of the Nasake people. The cultivated areas are divided into 2 types: one is very little vegetable gardens near the settlements, and the other is desolate fields on the other side of the island. These areas have not been utilized efficiently.

According to MIYAMOTO (1960), it seems that 200 years ago the Nasake Island was first inhabited and 100 years ago there were 20 households occupying the island. The population increased rapidly in the Taisho Period (1911-1925). Nowadays there are 93 households in the island, 13 households of which are of the school teachers. The teachers are excluded from

this survey owing to 2 reasons. The first reason is that they own their real homes outside the island, in which they leave their families and to which they usually come back on holidays. The second reason is that they have no direct relationships with fishing activities, which are the main problem of the survey.

In the Nasake Island, the houses stand roof by roof. Our measurement shows that in the Hon-ura (Map 2), the total areas of the dwelling houses proper, other structures (including huts) and the gardens are respectively 1800, 800 and 1500 sq. meters.

The population of the Nasake Island is 296, excluding the school teachers. Over 90 percent of them were born in the island. Majority of the rest came from the fishing villages near the Nasake when they married or were adopted. The population pyramid of the Nasake shows that there are few persons aged from the twenties to thirties (Fig. 1). It must be

Map 2. The Hon-ura settlement

Fig. 2. A motored boat of the Nasake fisherman

Map 3. The Nasake fishing area. It includes the 20 fishing grounds.

Fig. 1. The population pyramid in the Nasake Island, 1968.

(Dotted line shows the population in the Hon-ura settlement.)

noticed that just the same phenomenon may be found in most rural villages of Japan.

The author regards the whole population of the Nasake as forming 1 local group, which is divided into 4 settlements.* The settlements are Hotoke-noura, Hon-ura, Ôbata and I-no-ura. The number of households of them are respectively 9 (excluding 3 teachers' households), 43 (excluding 3 teachers'), 8 (excluding 7 teachers') and 20. The population of the settlements are respectively 43, 106, 25 and 77 (the teachers excluded).

FISHING IN THE NASAKE ISLAND

Fishing methods in the Nasake may be classified into the following 3: hand-line

fishing (*ippon-tsuri*), long-line fishing (*hae-nawa*) and octopus-pot fishing (*tako-tsubo*). Octopus-pot fishing is confined to only 1 fisherman, who is a mailman and seldom works on the sea. Long-line fishing is carried out exclusively by 2 households. The livelihood of most of the inhabitants of the Nasake depends on hand-line fishing.

Hand-line fishing is done throughout the year by almost all the fishermen of the island who own motored boats and associated equipments (Fig. 2). The fishermen goes to the sea every day,

operating a boat and catching fish himself.

The ordinary boat, made principally of cryptomeria wood, is about 7 meters in length and 2 meters in the maximum width. Within the boat there are wells (*ikesu*) for keeping fish and baits alive, and a hatch for storage of clothing and bedding and anchoring equipments. On short travels for getting baits or so, they use the hatch as a sleeping room. And in case of the drifting fishing on the windy day, a canvas sail (about 3 meter) is set on the stern to keep the direction of the axis of the boat constant in accordance with the wind. Moreover, they have a set of tent on board. When the sun shines strong they pitch it. It is about 3 meters in length and over 2 meters in width.

Hand-line fishing is divided into 2 types: the author names them a fixed

* The main criteria are the presence of 1 common head man and 2 seasonal festivals held in the cooperation of all islanders.

hand-line fishing (*kotei-ippon-tsuru*) and a drifting hand-line fishing (*nagashi-ippon-tsuru*). The fixed method requires the fishermen to scatter a large number of baits (mainly shrimps) in the same fishing ground for days successively before actual fishing in order to gather fish in it. A fisherman usually scatters shrimps 10 to 15 kilograms in weight in a day. This method is limited to a few fishing grounds, where tide is mild and never flows up by disturbance of the tide-flow owing to the rocky conditions of the sea bottom. In fact, this method is practiced by the only 3 or 4 of all the Nasake fishermen in the fishing of *Chrysophrys major* (*madaï*) from May to August and is practiced by 5 to 20 fishermen in the fishing of *Seriola quinqueradiata* (*buri*) for a brief period in summer. In this paper, the fishing activity by the fixed method is very little referred to.

In case of the drifting method, the activity of a fisherman in a fishing ground is as follows (Photos 1-9). Fisherman ordinarily sits against the hatch in the bow, facing backwards. A gear lever extends from a engine box in the central part to front of him, and a steering rod also extends from the rudder in the stern. He frequently operates the gear lever and the steering rod; when he pulls the gear lever, the lever is thrustured ahead and when he pushes the lever, it is thrustured astern. When the steering rod is pulled, the boat turns to the left and when it is pushed, the boat turns to the right. He drops a line, passing it through on his

forefinger of the left hand, in order to feel the tensity of the line sensitively.

In the fishing ground, he keeps a boat floating slowly along the tide, while the gear is set in the neutral. As the boat comes floating to the downstream end of the fishing ground, he draws the line up and operates his boat to come back to the other end to repeat the same process. But the movement is, in practice, not so mechanical because he must carefully operate his boat not to collide with each others by controlling the gear lever and the steering rod delicately. In general, 10 to 15 fishermen (10 to 15 boats) work at the same time in the same fishing ground. Also he must haul the line up and down owing to the unevenness of the sea bottom. Moreover, it happens that the sinker is caught in the rocks of the bottom and then the line cuts. In such a case, he has to mend the line. On the other hand, he must change the kind of the line according to conditions of a tide-flow, though it happens only on rare occasions.

The line, made of nylon, has 6 hooks and 1 sinker (about 20 grams). It is divided into 2 types: the first type is that little lead balls are tied to the line every 40 centimeters in interval. The total weight of the lead ball is about 120 to 150 grams per 30 fathoms (nearly 55 meters). The second type is only a line. The first type is used in the drifting method and the second one is mainly used in the fixed method.

There are 3 other main components of the drifting hand-line fishing. The first

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Photos

These photos show some typical postures of the Nasake fisherman on his boat.

Photos 1,2: his postures in travel

Photos 3-9: postures in fishing

component (1), boat-washing, is done on a beach once per half a lunar month. Its main purpose is clearing of sea-weeds and worms adhering to the boat. The second component (2), preparation of the sets of fishing lines, is also done once or twice per month. The task is that the fisherman ties hooks and branch-lines to a main line. Some of them do it in their houses, some on their boats in the harbour, and others on their boats while staying on the sea. The third component (3), the way of securing baits, varies to a great extent according to each fisherman. It is easy to obtain a suspected bait, while live baits are not so easy to be secured. The fishermen can get shrimps (*ebi*) from a shrimpdealer near the Nasake, but to obtain squids (*chiko-ika*) they must travel to distant places such as Matsuyama, Hiroshima, Onomichi or Aji (Map 1). Some fishermen usually use live baits and some mainly use suspected baits.

The fishes aimed at by the Nasake fishermen are *Chrysophrys major* (*ma-dai*), *Lateolabrax japonicus* (*suzuki*), *Seriola quinqueradiata* (*yazu*, *tsuchi* and *hamachi**) and *Trachurus trachurus* (*ma-aji*).

There are 20 fishing grounds in the fishing area of the Nasake (Map3). Legally, anybody can catch fish by the hand-line fishing in any of the fishing grounds, but, in practice, the operation in those fishing grounds is limited to

the Nasake fishermen. If the Nasake fishermen carry out fishing in other fishing grounds, they could not but accept the other fishermen to operate in the 20 fishing grounds. The above facts show that the territorialism is at work in the Nasake people, as regards the hand-line fishing in those 20 fishing grounds.

The bottom of the sea in 1 fishing ground (No. 3 in Map 3) is sandy and that in the other fishing grounds is rocky. The bottom is rugged and varies in depth. According to the fishermen each fishing ground has 1 or several fishing spots (*ishi* or *tsubo*). There is a rock in the central part of each fishing spot, around which a large number of fishes are said to congregate.

The fishermen use the different parts of the fishing ground in accordance with the difference in the kinds of fish caught, the season, the time of a day, the tide and other conditional factors. Which fishing ground is chosen for fishing is one of the most important factors for a good catch.

NATURAL CONDITIONS FOR FISHING

Many natural conditions are relevant to fishing activities themselves and the amount of a catch. Some of them are as follows:

1) Tide

One of the most important factors in fishing is the tide (*shio*). 1 cycle of a tide is half a lunar month, that is, 14 or 15 days. The cycle consists of a major tide (*o-shio*) and minor tide (*ko-shio*). The tide-flow is strongest in the major

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* Name varies with age and size: immature fish called *Yazu*, and mature fish, *hamachi*,

tide, in which the fishermen work in the shallow fishing grounds or the shallow parts of the fishing grounds. Some of the fishing grounds are used usually in the major tide and some of them are used usually in the minor tide. In the Nasake area, the amount of a catch is much higher in the major tide, in summer (Fig. 3).

High tide (*michi-shio*) and low tide (*hiki-shio*) occur respectively twice a day. Tide flows in the opposite direction on flowing and on ebbing. Some fishing grounds are suitable for fishing when tide is flowing, while some are suitable when it is ebbing.

2) Temperature of sea water

It is assumed that temperature of sea water influences the metabolism and bio-rhythm of fish and even its migration of it (SUEHIRO, 1960; LAGLER, 1962). According to our measurements, the surface temperature (about 1 meter deep) of sea water in the Nasake area is about 21°C to 24°C in summer. But we could not get any data of temperature in deep water in this area.

3) Wind

The Seto Inland Sea seldom sustains strong winds. According to the Nasake fishermen, wind hardly seems to influence the amount of a catch in the area. It does influence directly the motion of the human body or the fisherman's operation of the boat. There is, however, no day throughout the year on which winds prevent the fishermen from going out for fishing.

4) Fog

Sometimes a fishing ground is enveloped in a fog. A heavy fog prevents a fisherman from working, because he is not only able to operate his boat well, but also is not able to see the surrounding islands and rocks. If he is prevented from seeing them, it is very difficult for him to locate any good fishing spots in fishing grounds.

FISHERMAN'S SKILL

Fisherman's skill of hand-line fishing is divided into 2 categories according to my observations: the first category is intellectual skills such as the ability to select the fishing ground and the knowledge of the fishing spots at the fishing grounds and another is motor skills such as the operation of a boat and the sensibility of the finger to feel a fishing line to be pulled. According to my impression, the first category appears to depend mainly upon the intellectual faculty of the fisherman, and the second category upon his physical capacity. As the hand-line fishing with a motored boat in the Nasake demands little bodily powers, the intellectual faculty seems to be more significant. We assume that the intellectual faculty is determined by complex factors such as experience, science-consciousness, originality, boldness and so on.

DATA AND DISCUSSION OF ACTIVITY

I) Data on the fishing activities were obtained from 2 kinds of surveys: one is that TAKEDA¹⁾ or OHTSUKA traced each of the 20 fishermen²⁾ living in the Hon-ura

to record his activity during a day.

¹⁾ Dept. of Anthropology, Faculty of Sci., Univ. of Tokyo

²⁾ The number of the fishermen of the Hon-ura is 30 in total. We could not trace 10 of the fishermen, because 2 fishermen refused to be investigated and the other fishermen failed to be studied owing to the shortness of our study period.

(Table 2), (Figs. 3-6). Another is that we checked the time of departure and return of the 30 fishermen²⁾ living in the Hon-ura at the Hon-ura Harbour. We could check correctly their departures and returns in the harbour, because they never departed or returned without passing through the harbour. (Figs. 7, 8)

1) Total pattern of the temporal and

Table 2. List of the Nasake fishermen investigated

Individual number	Age	Birth place	Nos. of family members	Parents	Wife	Children	Others
1	23	Nasake I.	1	0	0	1	0
2	28	Nasake I.	1	0	1	0	0
3	30	not Nasake I.	0	0	0	0	0
4	30	Nasake I.	3	0	1	2	0
5	31	Nasake I.	3	0	1	2	0
6	32	Nasake I.	5	1	1	3	0
7	34	Nasake I.	5	0	1	4	0
8	34	Nasake I.	5	1	1	3	0
9	36	Nasake I.	3	0	1	2	0
10	37	Nasake I.	5	1	1	3	0
11	38	Yawata-hama (Ehime Pref.)	3	0	1	2	0
12	40	Nasake I.	4	1	0	3	0
13	41	Tsuwaji I. (Ehime Pref.)	4	0	1	3	0
14	41	Nasake I.	5	0	1	4	0
15	43	Nasake I.	5	0	1	4	0
16	47	Nasake I.	1	0	1	0	0
17	48	?, (Ehime Pref.)	0	0	0	0	0
18	50	Nasake I.	2	1	1	0	0
19	52	Nasake I.	3	0	1	1	1
20	53	Oshima I. (Yamaguchi Pref.)	6	0	1	5	0
21	62	Nasake I.	6	1	1	1	3
22	64	Nasake I.	1	0	1	0	0
23	64	Nasake I.	1	0	1	0	0
24	65	Nasake I.	1	0	1	0	0
25	66	Nasake I.	1	0	1	0	0
26	66	Nasake I.	2	0	1	1	0
27	68	Nasake I.	1	0	1	0	0
28	68	Nasake I.	1	0	1	0	0
29	69	Nasake I.	0	0	0	0	0
30	78	Nasake I.	1	0	1	0	0

"Child" includes the high-school students, who live outside the Nasake Island, except holidays.

Fig. 3. Daily fluctuation of the amount of catches of the 4 kinds of fishes and the total amount of a catch of all fishes among the investigated 30 fishermen (Jul. and Aug., 1967).

Fig. 4-1.

spatial structure of the drifting hand-line fishing activity.

Many of the Nasake fishermen begin to work on the sea from c. 5:00 to c. 6:00 in the morning although there are some who begin before 5:00 or after 6:00. At 6:00, about 90 percent of them work on the sea. The main fishing time of a day is from c. 6:00 to c. 10:00. After that, the number of the fishermen working on the sea decreases

Fig. 4-2.

Fig. 4-3.

Fig. 4-4.

The spatial structures of 4 fishermen in a day are shown for examples. The daily course of travelling of the individual fisherman.

till c. 14:00. And it increases again from c. 14:00. There is another peak of the fishing in the afternoon between 16:00 and 18:00, which is lower than that in the morning. After c. 18:00, the number of them rapidly decreases, and at 20:00 there is no fisherman working on the sea.

The time of the fishermen's staying on the sea may be divided into the 3 following categories on the basis of the nature of their activity: (1) the time of fishing, (2) the time of travelling and (3) the time of the other activities. The third category includes the time of resting, talking with other fishermen, preparing the line-set and other miscellaneous activities. Among the fishermen the time of daily travelling varies from 22 to 97 minutes. The time of the activities of the third category among them is more variable: it varies from 0 to 231 minutes. 8 of the 20 fishermen investigated spend no time in the activities of the third category, while 5 of them spend more than 100 minutes in these activities.

The interrelation between the time of staying on the sea and the time of fishing is less proportional than we assumed. The correlation coefficient between

Fig. 5. The temporal structure of the fishermen's daily fishing activities. The time of the checked part is impossible to be classified in any of the above 3 categories: 1—the time of his going to the Oshima Island by his boat with his families, 2—the time of his going to Yanagihara, in Ehime Pref. for purchasing little squids, 3 & 4—the time of his cleaning the boat.

them (r) is 0.74.

The individual variation in the spatial structure of their fishing activity is larger than that in the temporal structure so that it is difficult to find any tendencies or patterns in the spatial structure. The fishermen set out the Hon-ura Harbour, work in one or several fishing grounds successively, and return to the harbour. This process is usually repeated by them twice or three times a day. They do not stay in a single fishing ground so long. The number of the fishing grounds which they use in a day varies from 1 to 9. The total length of daily travels between the harbour and fishing grounds and between fishing grounds varies from 3 to 17.2 kilometers.

2) Individual variation of the temporal and spatial structure of the drifting hand-line fishing activity.

The individual variation in the temporal and spatial structure is very great among the Nasake fishermen. As regards the temporal structure, 2 points were made clear. The first point is that the time of staying on the sea in a day is very variable among the fishermen, while the time of fishing in a day is less variable than the former. The second point is that individual variation in the total time of staying on the sea for the 4 successive days is smaller than that for each of 1 day. The 4 successive days are from Aug. 12 to Aug. 15.

As regards the spatial structure, the

Fig. 6. The hours of the 20 fishermen's staying on the sea in a day, which is divided into 3 categories. The total distance (km) of the travel between the harbour and fishing grounds and between fishing grounds by boat in a day is shown below.

Fig. 7. The hours of the 30 fishermen's staying on the sea in the 4 successive days between Aug. 12 and Aug. 15, 1968. A circle means the short-time landing on the shore.

Fig. 8. The hours of each fisherman's staying on the sea in the 4 successive days between Aug. 12 and Aug. 15, 1968 (See the left scale). A histogram indicates the total hours of staying on the sea in the 4 days (See the right scale).

○ = Aug. 12
 ⊙ = Aug. 13
 ■ = Aug. 14
 ● = Aug. 15

data are very insufficient: The data obtained are those on the total distance and frequency of travels of the 20 fishermen in a single day. Accordingly the analysis of the spatial structure has less importance than that of the temporal structure. The only thing to be noticed is that the spatial structure has a great individual variation.

The interrelation between the temporal structure and the spatial structure points out one problem. It is explained by 2 correlation coefficients: one is that between the total length of travels and the total time of staying on the sea ($r=0.62$) and another is that between the total length of travels and the total time of fishing ($r=0.32$).

It is very difficult to find out that what produces the individual variation in the temporal and spatial structure. The age of the fishermen, however, seems to have less influence upon the individual variation than it was presumed before survey.

II) Data on the activity of women

The survey of the activity of 22 married women in the Hon-ura was done by means of a interview technique for the 5 successive days from Aug. 2 to Aug. 6. (Table 3)

Hand-line fishing demands little work except fishing on the sea. In the Nasake Island, the women seldom go fishing to the sea with their husbands. Accordingly, the women are hardly engaged in any fishing activities. In the period of our survey, only 1 of the 22 women went fishing several times with her husband.

Table 3. The division of subsistence activities of the Nasake married women during the 5 successive days. (Aug. 2-6, 1968)

Individual (her) No. of husband	Age	Fishing	Farming
4	24	(4)* ³	0
2	26	20	0
6	26	(6)	0
10	30	0	0
9	30	(1)	0
5	30	0	4
7	32	0	0
8	33	0	10
11	34	(4)	0
(*1)	34	0	9
13	34	0	0
14	35	0	0
18	46	0	43
20	47	0	17
19	49	0	15
21	52	((22))	4
26	57	0	19
27	62	0	1
(*2)	62	0	13
23	62	0	0
28	64	0	7
24	66	0	0

* 1 Her husband is a long-line fisherman

* 2 She is a widow. Her son who is a widwer, is the head of the houshold. His individual number is 12.

* 3 A parenthesis shows a time of cleaning a boat. Double parentheses show a time of preparing a fishing line set of long-line which belongs to the fisherman of the other household.

She is 26 years old and very fond of fishing. Some women, who are all younger wives, assisted their husbands to clean the boats on the beach. And 1 woman spent much time for preparing the sets of long-lines on the seashore.

On the other hand, they were not

engaged in farming activity so long. 11 of the 22 women spent no time in the farming activity. Only 1 woman worked over 8 hours per day on an average. In short, in the Nasake Island the women are much less concerned with subsistence activities than the men.

SUMMARY

This paper is based on the field works in the Nasake Island, the Seto Inland Sea, which were carried out for about 1 week in July and about 4 weeks in August, 1968. In my opinion, when we study the human life or activity (especially subsistence activity) from an ecological point of view, the temporal and spatial structure is regarded as a primary expression of the human activity system. It is hoped that this paper will be the first step to develop the study mentioned above.

The Nasake Island is approximately 5 kilometers in circumference and its population is about 300. Over 90 per cent of the all adult men in the Nasake are engaged in hand-line fishing (*ippon-tsuri*). Every day each fisherman himself operates his motored boat and catch fish near the Nasake Island.

Tentative conclusions of this study are as follows:

- 1) The individual variation in the temporal and spatial structure of their fishing activities is very great.
- 2) As regards the time of staying on the sea, the individual variation in the total time of staying on the sea for the 4 successive days is smaller than that for each of 1 day.
- 3) The correlation coefficient (r) between the time of staying on the sea and the time of fishing is 0.74.
- 4) The correlation coefficients between the total length of travels and the time of staying on the sea and between the total length of travels and the time of fishing are respectively 0.62 and 0.32.
- 5) We could not find out that what produces the individual variation in the temporal and spatial structure, however, the age of the fishermen seems to have little influence upon the individual variation.
- 6) In the Nasake Island, the women are much less concerned with subsistence activities than the men.

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情島漁民の生態学的研究（予報）

——個人追跡法により明らかにされた彼らの活動系の時間・空間構造——

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瀬戸内海の一漁村における生態学的なフィールド調査を1968年の7月約1週間、8月に約4週間行い、その結果の一部をまとめた。筆者は生態学的見地からヒトの生活・活動（特に生産活動）を調べるのに、もつとも基本的な表現として時間・空間構造を明らかにすべきと考えている。今回の調査はそのための具体的な一例にすぎないが、このような方法の開拓の第一歩になることを期待している。

調査地は情島とよばれ、周囲約5 km、人口約300の島で、成人男子の9割以上が一本釣漁業に従事し、それにより生計をたてている。彼らはモーターのついた1人乗りの小さな漁船を操り、毎日、沿岸で漁をしている。

この調査で明らかになったことは、(1) 彼らの生産活動の時間・空間構造において非常に大きな個人差がみられる。(2) 海上にいる時間をみると、1日における個人差は連続した4日間の合計時間の個人差よりは小さい。(3) 海上にいる時間と実際に漁をしている時間との相関は $r=0.74$ である。(4) 海上にいる時間と移動した距離の相関は $r=0.62$ 、漁をしている時間と移動した距離との相関は $r=0.32$ である。(5) 個人差の原因は明らかにできなかったが、漁民の年齢はそれほど関与していないと思われる。(6) 情島においては、女性は男性と比較して、生産活動に従事している時間は非常に短い。