Methodological Considerations of Regional Planning by a Unit

in Rural Areas

- Through a Case Study in Underpopulated Regions, Gokayama in Japan -

Tomoko Mori *

Abstract:

Today's regional planning requires careful examination especially not as development planning but as declining planning under depopulation in Japan. Even though considerable attention has been paid to the research of urban regeneration under decline, there is a paucity of research on planning in rural areas where City Planning Act cannot reach. Therefore it is still a great challenge to make planning in rural areas under depopulation.

The purpose of this study is to demonstrate methodological considerations of regional planning in rural areas by a unit, which previous research has clarified as one of peculiarities of villages. The study was conducted by the case study in one of under populated regions in Gokayama, Japan. As a result, the scale of today's village tends to follow its pre modern scale. In other words, higher productive villages are still more advantageously villages to live.

In conclusion, we can forecast future region in rural areas by pre-modern village scales, which reflect on productivity in pre modern period. Finally, the study suggests the methodology for regional planning by a pre modern unit analysis.

Keywords:

Regional Planning, Methodology, Units, Rural Areas, Villages

* This is an abstract peer-reviewed by the International Affairs Committee of the City Planning Institute of Japan for ISCP2014.

^{*} The University of Tokyo

E-Mail: tm@ud.t.u-tokyo.ac.jp

1. INTRODUCTION

Today's regional planning requires careful examination especially not as development planning but as declining planning under depopulation in Japan. Even though considerable attention has been paid to the research of urban regeneration under decline, there is a paucity of research on planning in rural areas where City Planning Act cannot reach. Therefore it is still a great challenge to make planning in rural areas under depopulation.

The purpose of this study is to demonstrate methodological considerations of regional planning in rural areas by a unit, which previous research has clarified as one of peculiarities of villages. Regarding space that man created, Nishimura (2004) ¹⁾ points out that principles of the space are consisted of *"intention of planning"*. This paper, therefore, aims to build an understanding on how man worked on nature by a unit analysis in a region, through a case study of demonstrating *"intention of planning"* in Gokayama where two of world heritage villages are.

This paper starts with a brief review about pilot studies on land uses in a village and unity in a region in Japan. It then demonstrates methodological considerations of a region in rural areas by a unit; followed by a chapter introducing Gokayama as a case study; we can still recognize these spatial peculiarities in today's Gokayama; and thus the significance of finding the peculiarity of the region is a fundamental way to understand it as man's *"intension of planning"* in nature, and the study classifies a village. The study finally focuses on how the village scale, the population, changes relatively in Gokayama from pre modern period by farming under natural conditions to today as post modern.

In conclusion, the study demonstrates that we can forecast future region in rural areas by pre-modern village scales, which reflect on pre modern period. Thus, the study suggests the methodology for regional planning by a pre modern unit analysis.

2. A UNIT of THE REGION in RURAL AREAS

2-1 Three Land Uses in a Village

Yanagida (1910)²⁾ pointing out that a village had three land uses, Fukuda (1980)³⁾ showed the conceptual figure (Fig.1) and pointed out that a village consisted of three land uses, habitation, cultivation and mountain areas. In general, a village is considered only as a habitation area; however, AIJ (1989)⁴⁾ demonstrated that the territory including these three land uses reflects environmentally integrated units as a village.

Therefore the study considers the figure.1 as a unit of a village.



Figure-1 Three Land Uses in a Village ⁽¹⁾

2-2 Unity in a region

Then, the study applies it to a regional scale. A region consisting of some villages, the study considers a region as groups of villages (Fig.2).

From next chapter, using these concepts, it demonstrates how Gokayama region can be understood by analyzing the *"intention of planning"* in Gokayama.



Figure-2 Conceptual figure of REGION by units (by the author)

3. CASE STUDY in GOKAYAMA

3-1 Brief Background of Gokayama

Gokayama is a well-known region having two historic villages, Ainokura and Suganuma, in Shirakawa-go and Gokayama inscribed to World Cultural Heritage lists as unique Gassho-style houses in 1995. It was "located in a mountainous region that was cut off from the rest of the world for a long period of time, these villages with their Gassho-style houses subsisted on the cultivation of mulberry trees and the rearing of silkworms. The large houses with their steeply pitched thatched roofs are the only examples of their kind in Japan. Despite economic upheavals, the villages of Ogimachi, Ainokura and Suganuma are outstanding examples of a traditional way of life perfectly adapted to the environment and people's social and economic circumstances"⁵⁾.



Figure-3 Gokayama in Japan



Figure-4 Gokayama in Toyama-prefecture



Figure-5 Transition of population in Gokayama⁽²⁾

Methodological considerations of regional planning in rural areas are studied using the case study in Gokayama, one of underpopulated regions (Fig.5) in Japan, where City Planning Act cannot reach.

The case study consists of mainly two analyses focusing on a village as a unit in the region. One is an analysis of a region itself and the other is of a scale change from Edo-era in 1839 to today in 2013 by a village in Gokayama.

3-2 A unit in the region⁶⁾

Applying the above-mentioned concept (Fig.2) to Gokayama, it can be divided into forty-four villages. As a region consists of some "Oaza⁽³⁾", a sphere of a village, Fig.6 shows how Gokayama region can be divided into 44 units.

Table-1 Site quality by a village (unit) ⁷ M: Hillock, G: Sandy gravel terrace S: the SHO river valley, O: the OTANI river valley A: the SAKAI river valley N: the NASHITANI river valley

Valley of prehistori the river Type sites

Name of Village



1 SHOUJIKURA	×	M	S	MS	_	XS	XS	—
2 SOYAMA	0	G	S	GS	•	L	М	s
3 JO	×	М	S	MS	_	XS	XS	—
4 SUGIO	0	М	S	MS	•	S	М	S
5 TONOHARA	less5	М	S	MS	•	XS	s	XS
6 OOKUZUSHIMA	0	М	S	MS	•	М	S	s
7 SUGAWA	0	М	S	MS	•	S	S	s
8 IRITANI	0	М	S	MS	-	L	М	S
9 HIGASHINAKAE	0	G	S	GS	•	S	М	М
10 TAKASOUREI	0	М	S	MS	•	LL	L	S
11 NATSUYAKE	0	М	0	MO	-	XS	XS	XS
12 SHIMODE	0	G	0	GO	•	LL	L	L
13 KAGOTO	0	G	S	GS	•	LL	М	М
14 OOSHIMA	0	М	S	MS	-	LL	LL	LL
15 SHIMONASHI	0	G	S	GS	•	LL	LL	LL
16 KAMIMATSUO	0	М	S	MS	-	М	S	XS
17 TASHIRO	×	М	S	MS	-	XS	XS	—
18 NASHITANI	no residents	М	N	MN	-	S	М	—
19 KOKURUSU	0	М	S	MS	•	L	М	М
20 KURUSU	0	М	S	MS	•	S	М	М
21 NAKABATAKE	0	М	S	MS	-	М	М	М
22 MIZA	0	М	S	MS	-	L	М	М
23 AINOKURA	0	М	S	MS	-	L	L	М
24 KAMINASHI	0	М	S	MS	٠	L	L	L
25 TAMUKAI	0	G	S	GS	•	L	М	М
26 INOTANI	0	G	S	GS	-	LL	L	LL
27 KAIMUKURA	0	G	S	GS	•	L	L	М
28 OHARA	0	G	S	GS	•	М	М	М
29 MUKURAJIMA	MOVED	G	S	GS	-	XS	XS	—
30 HOSOJIMA	0	G	S	GS	•	М	М	L
31 SUGANUMA	0	G	S	GS	•	S	М	S
32 OZE	0	М	S	MS	٠	XS	XS	XS
33 URUSHITANI	0	G	S	GS	٠	М	М	S
34 TANOSITA	0	G	S	GS	-	XS	S	S
35 KAMINAKADA	×	G	S	GS	٠	XS	S	—
36 SHIMOJIMA	0	G	S	GS	٠	S	S	М
37 ATARASHIYA	0	G	S	GS	-	S	S	L
38 HIGASHIAKAO	0	G	S	GS	٠	S	М	XS
39 MAKI	0	G	S	GS	-	XS	XS	S
40 NISHIAKAOMACHI	0	G	S	GS	٠	LL	L	L
41 KOUZU	0	G	S	GS	٠	LL	М	L
42 NARUDE	0	G	S	GS	٠	XS	XS	S
43 UCHIKOSHI	×	М	Α	MA	-	XS	XS	—
44 KATSURA	×	G	Α	GA	-	XS	S	-

Figure-6 Gokayama by 44 units ⁷⁾

3-3 Analysis of the units⁶⁾

Through Fig.6, the boundary of Gokayama region accords with river valleys. Probably "Oaza", a unit in the region, is considered to correspond to nature as well. Most villages in Kami-Taira area lie sporadically beside the SHO River with a simple sphere, while villages in Taira area cluster around with a complicated sphere. This makes the landscape different. This paper tries to explain the reason from the analysis: a typology, a river valley, a yield of crops in 1839, and population in1872 (Fig.6 and Table.1).

Most habitation areas are settled in the SHO river valley on both of hillock sites (M) and sandy gravel terraces (G) (Fig.7). Since many prehistoric sites are on GS: the sandy gravel terrace in the SHO river valley, it can be recognized as the most qualified habitation area in the region where SHIMONASHI, which has the largest population in Gokayama, is. So a site quality is one of important factors, which determine a scale of villages.



Figure-7 Site quality by a village scale in habitation areas ⁷⁾

The yield of crops in 1839 tends to be similar to the population in 1872 (Table.1). Therefore the study considers the scale of a village as its yield of crops.

<u>3-4 Spatial types of a unit⁶⁾</u>

Next, using the data of the size of three land uses by each village in 1868, the study analyzes the region by four areas, Akao, Kaminashi, Shimonashi and Otani (Table.2).

Even though the size of Shimonashi is only 12% of the region, its yield of crops is the biggest one in the region (Fig.8). It is obvious that the size of areas does not correspond to its yield of crops. On the other hand, shimonashi that has the biggest cultivation areas in the region yields the largest amount of crops (Fig.8 and Fig.9). The portion of the yield of crops in areas corresponds to the portion of the cultivation areas. Productivity of a village corresponds not to a total area but to a cultivating area.

That is, higher cultivating land use rates in a village, lager village scales in yield and population, which is in proportion to its yield.

Aled No. Name present (cho) percentage (cho) (chou) (chou) <th< th=""><th>XS L XS S XS M</th></th<>	XS L XS S XS M
1 SHOUJIKURA × 0.0400 0.12% 2.9507 8.79% 30.5818 91.09% 33.5725 15.413 2 SOYAMA O 0.8316 0.26% 20.8033 6.59% 294.0023 93.15% 315.6372 120.793 3 JO × 0.0814 0.41% 1.8837 9.57% 17.7100 90.01% 19.6751 5.705 Stimonath 4 SUGIO O 0.6828 0.32% 11.4628 5.31% 203.5710 94.37% 215.7166 57.658 Otani 5 TONOHARA O 0.2128 0.50% 4.6913 11.04% 37.5917 88.46% 42.4958 23.589 6 OOKUZUSHIMA O 0.6312 0.60% 12.1700 11.65% 91.6327 87.74% 104.4339 70.733 7 SUGAWA O 0.3729 0.73% 7.6629 14.95% 43.2225 84.32% 51.2583 65.691	XS L XS S XS M
2 SOYAMA O 0.8316 0.26% 20.8033 6.59% 294.0023 93.15% 315.6372 120.793 3 JO × 0.0814 0.41% 1.8837 9.57% 17.7100 90.01% 19.6751 5.705 Stimonati 4 SUGIO O 0.6828 0.32% 11.4628 5.31% 203.5710 94.37% 215.7166 57.658 Otani 5 TONOHARA O 0.2128 0.50% 4.6913 11.04% 37.5917 88.46% 42.4958 23.589 6 OKUZUSHIMA O 0.6312 0.60% 12.1700 11.65% 91.6327 87.74% 104.4339 70.733 7 SUGAWA O 0.3729 0.73% 7.6629 14.95% 43.2225 84.32% 51.2583 65.691	L XS S XS M
3 JO × 0.0814 0.41% 1.8837 9.57% 17.7100 90.01% 19.6751 5.705 Stimonath 4 SUGIO O 0.6828 0.32% 11.4628 5.31% 203.5710 94.37% 215.7166 57.658 Otani 5 TONOHARA O 0.2128 0.50% 4.6913 11.04% 37.5917 88.46% 42.4958 23.589 6 OOKUZUSHIMA O 0.6312 0.60% 12.1700 11.65% 91.6327 87.74% 104.4339 70.733 7 SUGAWA O 0.3729 0.73% 7.6629 14.95% 43.2225 84.32% 51.2583 65.691	XS S XS M
Stimonanti 4 SUGIO O 0.6828 0.32% 11.4628 5.31% 203.5710 94.37% 215.7166 57.658 Otani 5 TONOHARA O 0.2128 0.50% 4.6913 11.04% 37.5917 88.46% 42.4958 23.589 6 OOKUZUSHIMA O 0.6312 0.60% 12.1700 11.65% 91.6327 87.74% 104.4339 70.733 7 SUGAWA O 0.3729 0.73% 7.6629 14.95% 43.2225 84.32% 51.2583 65.691	S XS M
Otani 5 TONOHARA O 0.2128 0.50% 4.6913 11.04% 37.5917 88.46% 42.4958 23.589 6 OOKUZUSHIMA O 0.6312 0.60% 12.1700 11.65% 91.6327 87.74% 104.4339 70.733 7 SUGAWA O 0.3729 0.73% 7.6629 14.95% 43.2225 84.32% 51.2583 65.691	XS M
6 OOKUZUSHIMA ○ 0.6312 0.60% 12.1700 11.65% 91.6327 87.74% 104.4339 70.733 7 SUGAWA ○ 0.3729 0.73% 7.6629 14.95% 43.2225 84.32% 51.2583 65.691	М
7 SUGAWA O 0.3729 0.73% 7.6629 14.95% 43.2225 84.32% 51.2583 65.691	
	S
8 IRITANI O 0.6603 0.38% 10.9750 6.35% 161.2807 93.27% 172.9160 104.776	L
9 HIGASHINAKAE O 0.6026 1.03% 9.0424 15.45% 48.8816 83.52% 58.5266 54.169	S
10 TAKASOUREI O 1.2015 0.72% 22.8845 13.73% 142.5827 85.55% 166.6687 187.703	LL
11 NATSUYAKE O 0.1206 0.60% 4.8919 24.30% 15.1200 75.10% 20.1325 22.529	XS
12 SHIMODE O 1.8119 0.36% 24.2725 4.77% 482.9123 94.88% 508.9967 218.458	LL
13 KAGOTO O 1.1906 0.82% 29.4521 20.27% 114.6403 78.91% 145.2830 156.738	LL
14 OOSHIMA O 1.7209 1.43% 36.7048 30.60% 81.5215 67.96% 119.9472 205.146	LL
15 SHIMONASHI O 2.5406 1.35% 43.0637 22.83% 142.9908 75.82% 188.5951 259.339	LL
16 KAMIMATSUO O 0.5012 0.67% 6.8007 9.14% 67.1202 90.19% 74.4221 75.543	М
17 TASHIRO × 0.1023 0.25% 3.7125 9.17% 36.6805 90.58% 40.4953 20.729	XS
Shimonashi 18 NASHITANI 🛆 0.7301 0.31% 11.8622 5.11% 219.3909 94.57% 231.9832 60.021	S
19 KOKURUSU O 0.9610 1.19% 13.3422 16.50% 66.5426 82.31% 80.8458 120.696	L
20 KURUSU O 0.5714 1.56% 5.5526 15.18% 30.4520 83.26% 36.5760 46.229	S
21 NAKABATAKE O 0.6324 1.04% 7.6442 12.57% 52.5126 86.38% 60.7892 85.399	М
22 MIZA O 0.8127 1.12% 14.0420 19.27% 58.0025 79.61% 72.8572 118.738	L
23 AINOKURA O 1.1128 0.66% 24.1008 14.30% 143.2734 85.04% 168.4870 121.271	L
24 KAMINASHI O 1.2914 0.89% 22.6214 15.54% 121.7002 83.58% 145.6130 115.642	L
25 TAMUKAI O 0.7825 0.35% 11.1720 5.06% 208.9202 94.59% 220.8747 120.250	L
26 INOTANI O 1.5605 1.24% 19.3003 15.28% 105.4437 83.48% 126.3045 146.500	LL
Kaminashi 27 KAIMUKURA O 1.1908 unknown 17.8702 unknown - unknown unknown 118.642	L
28 OHARA O 1.2303 1.03% 13.2847 11.16% 104.5641 87.81% 119.0791 86.671	М
29 МИКИГАЛМА – 0.2200 0.80% 4.3208 15.64% 23.0804 83.56% 27.6212 18.526	XS
30 HOSOJIMA O 0.9711 1.00% 11.6811 12.05% 84.2516 86.94% 96.9038 88.085	М
31 SUGANUMA O 0.5604 1.18% 8.9511 18.80% 38.0908 80.02% 47.6023 53.951	S
32 OZE O 0.2901 0.15% 2.7306 1.43% 188.2306 98.42% 191.2513 20.188	XS
33 URUSHITANI O 1.0415 0.16% 10.7640 1.65% 639.5907 98.19% 651.3962 96.283	М
34 TANOSITA O 0.3617 0.83% 6.2348 14.33% 36.9021 84.84% 43.4986 22.192	XS
35 KAMINAKADA × 0.4207 0.50% 7.5212 8.99% 75.7230 90.51% 83.6649 35.742	XS
36 SHIMOJIMA O 1.0100 0.87% 9.7637 8.38% 105.6913 90.75% 116.4650 53.083	S
37 ATARASHIYA O 0.4810 0.41% 8.7714 7.43% 108.7729 92.16% 118.0253 56.237	S
Akao 38 HIGASHIAKAO O 0.5823 0.30% 9.8527 5.08% 183.5417 94.62% 193.9767 63.496	S
39 MAKI O 0.1928 0.40% 5.1420 10.64% 43.0111 88.97% 48.3459 27.600	XS
40 NISHIAKAOMACHI O 2.1400 0.08% 21.5033 0.79% 2704.3921 99.13% 2728.0354 152.996	LL
41 KOUZU O 0.6621 0.18% 15.9829 4.38% 348.2807 95.44% 364.9257 148.842	LL
42 NARUDE O 0.1314 0.09% 3.9022 2.65% 143.4923 97.27% 147.5259 31.538	XS
43 UCHIKOSHI × 0.1026 0.06% 1.2106 0.70% 171.7908 99.24% 173.1040 12.754	XS
44 KATSURA × 0.2920 0.01% 5.1120 0.17% 3021.3417 99.82% 3026.7457 11.192	XS

Table-2 Size of the units by three land uses and its yield of crops in 1839 $^{\rm (4)}$



Figure-8 The portion of four areas by their sizes (left) and their yield of crops (right)



Figure-9 The portion of four areas by their three land uses

Since it reflects on a landscape, the study classifies a village, a unit, into two types (Fig.10). Mountain type implies small portion of yield of crops, and Field type implies large portion of yield of crops. Since the yield of crops in 1839 tends to be similar to the population in 1872 (Table.1), the unit is grouped into two types, the Mountain type (small scale of population) and the Field type (a large scale of population), respectively.

Gokayama consists of these two units, which are reflecting on their natural condition. That is *"intention of planning"*, how man worked on nature in Gokayama.



Figure-10 Two types of a unit ("mountain type" as a small scale village, "field type" as a large scale village) ⁷

3-5 Analysis of a scale change by a unit between 1839 and 2013

Now, the study focuses on how the village scale changes relatively by a village in Gokayama from pre modern period in 1839 by farming under natural conditions to today as post modern in 2013 (Table.1). The population in Gokayama has decreased since after World War II and several political acts have conducted to promote for independence; however it cannot be stopped (Fig.5).

The study analyses the change by two figures showing forty-four village scales (Fig.11 and Fig.12). As a result, five naturally extinct villages are all small scales, "mountain type", and the scale of today's village tends to follow its pre modern scale. In other words, higher productive villages are still more advantageously villages to live.



Figure-11 Gokayama by a unit scale in 1839

Figure-12 Gokayama by a unit scale in 2013

4. CONCLUSION

As is evident from the results, the scale of today's village tends to follow its pre modern scale. In other words, we can understand that higher productive villages in pre modern era are still more advantageously villages to live today.

In conclusion, we can forecast future region in rural areas by pre-modern village scales, "two unit types", which reflect on productivity in pre modern period (Fig.13). Thus, the study suggests the methodology for regional planning by a pre modern unit analysis.

(extinct) Village mountain type	Village field type R	Village ^{field type}	Village ^{mountain type} N	Village field type
(extinct) Village mountain type	Village field type	Village mountain type	Village field type	(extinct) Village mountain type

Figure-13 Forecast for future REGION by two unit type analysis

Note:

- (1) Quoting from the reference 3, the author translated Japanese words into English words.
- (2) The author made this figure by using a national census data in 2010.
- (3) "*Oaza*" is a name of a village traced back in Edo era, which had vanished already by modernized governance. In other words, we still can recognize the village sphere through "*Oaza*", which is used as the smallest administrative unit in local autonomy nowadays.
- (4) The author made this table by using the data from FUJITA, Bai. MEIJI SHONEN NO TONAMI, Association of Tonami Library, 1982 (*in Japanese*)

Reference:

(The author translates Japanese books and Journal papers to English.)

- 1) Nishimura, Yukio. Urban Conservation Planning, Tokyo: the University of Tokyo Press, 2004 (In Japanese)
- 2) Yanagida, Kunio. Jidai to Nosei [The times and the agricultural policy],1910, The revised edition of Kunio Yanagida No.16, Tokyo: Chikuma shobo, 1962 (In Japanese)
- 3) Fukuda, Ajio. The village territory theory. The journal of human and cultural sciences. 1980, 12(2), pp.217-247 (In Japanese)
- 4) Architectural Institute of Japan (AIJ). Zusetsu shuraku [Atlas of a village], Toshibunkasha, 1989, p.9 (In Japanese)
- 5) UNESCO. http://whc.unesco.org/en/list/734 (accessed on 2013.9.29) (In English)
- Mori, Tomoko. The spatial deep structure of Cultural Landscape in Gokayama based on oaza. Journal of the City Planning Institute of Japan. 2013, 48(3), pp.579-584. (In Japanese with English Abstract)
- Mori, Tomoko. The study on the peculiarity of mountain villages for Cultural Landscape Conservation, The 12th International Congress of Asian Planning School Association in Taipei, 2013 (In English)