

A Study on the Improvement of the Living Environment in Depopulated Area -A Case Study in Ikeda-town, Fukui-

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A Study on the Improvement of the Living Environment in Depopulated Area

—A Case Study in Ikeda-town, Fukui—

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Abstract. This study aims to improve a living environment base on the resident consciousness in a depopulated area. Firstly, we clear the evaluation to the living environment, the settlement intension and the importance of the living environment improvement by the consciousness survey. And then, we analyze the relativity both the evaluation to the living environment and the settlement intension through the examination of Casual Relationship. Therefore, we suggest the measures for the improvement to the living environment as public traffic, shopping and welfare, which to enhance the settlement intension in the depopulated area.

1. Introduction

In recent years, a living place has faced with a crisis of continuation by depopulation which due to fall of the autonomous function with decline of industry or economy in a depopulated area. According to the investigation report of the Ministry of Land, Infrastructure and Transport Japan (2006), it is shown that a little more than 4% of colony may disappear among about 62,000 colonies in all over the country. And it is described "Regional structure must aim at compact structure when various facilities run short". In national prefectures, moreover, it is developed the bold measure which aims at the reorganization of the living environment, such as maintenance and activation of the self-government association function or relocation of colonies by integration of two or more self-government associations.

However, the reorganization of the living environment is not so easy in living places or colonies of depopulated area, because of strong settlement intention with reasons of attachment heart, shared territorial bonding and blood relative, etc., in addition to many elderly people had long habitation history. Therefore, it is not stopped the collapse of region community with gaps which are seen between many problems to the living environment and measures for problem dissolution. Accordingly, a long-term strategy is indispensable with the immediate action urged to actual condition after the revaluation of the living environment

(Keyword: depopulated area, living environment, settlement intention, casual relationship)

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based on the resident consciousness, for the improvement of the living environment in depopulated area.

This study aims to examine the improvement course of the living environment which can continue a living over the future with the improvement or the conquest of a social vulnerability, and is made the following three points. In addition, it is a case study on Ikeda-town, Fukui.

- 1) It is checked importance on the improvement of the living environment by analysis of the evaluation to the living environment and the settlement intention, through grasping of the actual condition and the consciousness survey in the depopulated area.
- 2) It changes in fixed quantity of the relativity through Casual Structure Analysis based on the consciousness survey, in order to grasp a effect between the evaluation to the living environment and the settlement intention.
- c. It is showed that the improvement course of the living environment which is a suitable for a continuously living of residents by Casual Structure Analysis.

2. The subject area

In the study, Ikeda-town, Fukui which shows in Fig.1 is taken up the subject area. As shown in Table 1 and 2, aging is progressing remarkably, as the aging rate is about twice compared with the neighboring areas inside of Fukui. And about 40 percent of population is decreasing to the present after being the pecified depopulated area. Therefore, it is remarkable that reduction of residence, commercial and industrial facilities with decreasing in population. On the other hand, medical and welfare facilities are upward tendencies a little. This result to the base formation of aged-house or compound-medical facilities (HOToplaza¹⁾) in center of the town and the foundation of town-bus (NAKAMAGO²⁾) which connects these facilities to hinterlands.

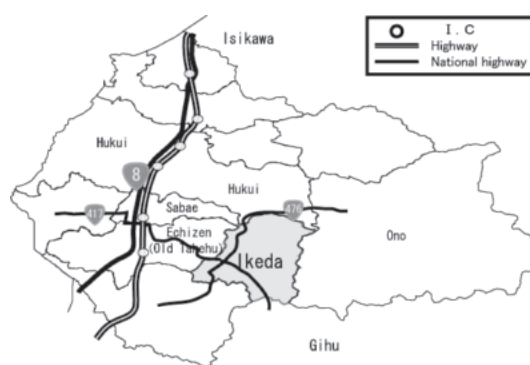


Fig.1 The subject area

Table 1: The population transition

Area	Population		Elderly people	Population density
	Person	Change		
Ikeda	3,405	-38.4%	39.2%	17.5
Fukui	253,642	17.9%	21.1%	502.0
Etsizen	74,575	1.1%	21.9%	380.2

※The 2005 national census

※Population growth rate is 1970 standard

Although it is assumed that decrease in population becomes a serious situation in the further future, it is necessary to clarify the evaluation of the residents to the living environment and the conditions for dissolution of decrease in population, if it takes into consideration that the base enterprise etc. is

Table 2: The Change of the facilities

facilities	H	C	I	M/W
1972	1,317	90	32	11
2005	1,060	56	19	13
Change	-19.5%	-37.8%	-40.6%	18.2%

※1972 and 2005 Ikeda-town vigor survey

※H: Housing, C: Commercial facilities

I: Industrial facilities, M/W: Medical/Welfare facilities

advanced as the measure.

3. The resident consciousness to the living environment

3.1 The outline of the consciousness survey

The outline of the consciousness survey and the individual attribute of the respondents are shown in Table 3 and 4.

In Table 4, it can be said that it is the reply which reflected the actual condition of the living environment was holding the whole age group in the area, because of the age composition is close to the composition on the actual age. In 「Habitation chronicle」, moreover, it is thought that it was answered based on the long experience and the knowledge over the area, as 80 percent or more of the respondents are 30 years or more.

Table 3: The outline of the consciousness survey

- Time	December, 2006
- Region	Ikeda-town, Fukui
- Candidate	Residents
- Distribution	1000 votes
	Distributes all the households directly
	Collects by mail
- Recovery rate	38.2%

Table 4: The individual attribute %

Sex	Habitation chronicle	Age		Main Transportation			
		0-9	10-29	15-30	31-50	Car and Bike	Public traffic
Male	54	4	16	2	21	85	2
		27	32	3	10	10	
Female	46	53	45				3

3.2 The results of the consciousness survey

The result of the consciousness survey is obtained the reply about five environment as "Shopping", "Medical", "Education/Traffic", "Welfare", and "Neighborhood/Nature", and is shown in Table 5.

First, in "Shopping" and "Medical", numerical fewness and lack such as service or facilities are pointed out as problems. And management is difficult because of the low profitability and the demand of these facilities in the area. Therefore, it is necessary that the dissolution through cooperation with the neighboring area.

Next, in "Education/Traffic", in addition to the inconvenient of the public traffic, it is required a new measure for the attending school of children and the public traffic in the consideration of the aging or the children as there is much indication to the inconvenient of the attending school. Moreover, in "Welfare", welfare base obtained the good evaluation from the resident in central part of the town. And in "Neighborhood/Natural", it is many affirmative opinions to the

Table 5: The results of the survey n= 382

Question item		%	
E n v i r o n m e n t	Shopping	Few institutions	72
		Shortage of service	67
		Far and hard to use	48
	Medical	Inconvenience of transportation	37
		Few institutions	60
		Shortage of service	54
	Education / Traffic	Far and hard to use	52
		Inconvenience of transportation	32
		Hard to use public bus	57
	Welfare	Few institutions for a child	43
		Far to attending school.	42
		hard to use welfare bus	31
	Neighborhood / Nature	Far and hard to use	37
		Inconvenience of transportation	31
		Shortage of service	22
Satisfaction	Comfortable life	61	
	Help of neighborhoods	47	
	Exchange with neighborhood	38	
	Environmental movement	33	
	Natural environment	73	
Satisfaction	Exchange in neighborhood	51	
	Medical treatment and welfare	34	
	Education environment	31	
	Shopping environment	20	
	Traffic environment	19	

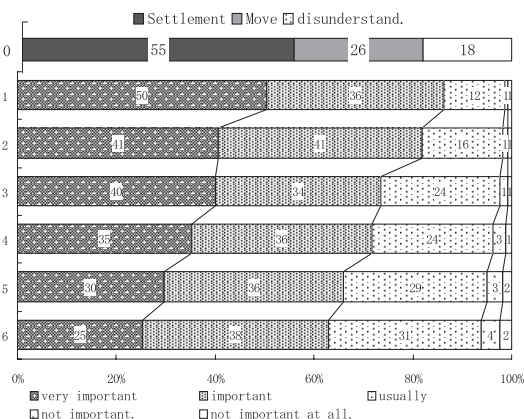
※The rate about environment shows "I considering"

※The rate about satisfaction shows "satisfaction"

regional rich nature and exchange with the neighborhood.

At the last, "Satisfaction" is low on the whole living environment, although "Satisfaction" to "exchange with nature or neighborhood" is high. Therefore, it is important that the improvement of the living environment which has grasped these causes exactly.

On the other hand, in "Settlement intention" and "Importance of living environment" as Fig.2, the respondent who is asking for settlement accounts for about 60 percent and migration accounts for about 20 percent. From this, the strong settlement intention checked to the area by the resident's attachment heart. In "Importance of living environment", response made important to the all items is over 60 percent or more. The strong request to the improvement of the living environment was felt.



※0: Settlement Intention, 1-7: Importance item
 1. Medical/Welfare, 2. Traffic, 3. Education
 4. Natural, 5. Shopping, 6. Neighborhood
 Fig. 2 The importance of the living environment

4. The evaluation to the living environment and the settlement intention

4.1 Casual Structural Model

In analysis of Casual Structural Model, the high correlation item was deleted by Correlation Analysis after deleting some items with no answer, in order to use only ordinal scale. And Factor Analysis used above cleaning data clarify observed variable is classified according to what kind of construct concept. At the result, five factors were obtained as construct concept, as in Table 6.

Table 6: The result of Factor Analysis

Living Environment	Fac.1	Fac.2	Fac.3	Fac.4	Fac.5
W Transportation	0.77	0.37	-0.02	-0.07	0.17
W Distance	0.74	0.29	-0.07	0.01	0.28
W Services	0.61	0.12	-0.14	0.19	0.15
W Welfare-bus	0.57	0.16	-0.13	0.30	0.12
M Number of facilities	0.19	0.65	-0.08	0.26	0.14
M Treatment range	0.16	0.64	-0.08	0.41	0.11
M Use of outside town	0.18	0.64	0.04	0.12	0.14
N Transportation	0.35	0.63	0.01	0.03	0.07
N Exchange	-0.06	0.02	0.78	-0.06	-0.02
N Env. movement	0.02	-0.03	0.71	-0.09	-0.05
NT Familiar natural	-0.13	-0.09	0.52	0.04	0.05
S Service	0.13	0.13	-0.07	0.73	0.06
S Number of facilities	0.06	0.29	-0.05	0.68	0.15
E Distance	0.28	0.21	0.04	0.06	0.66
E Number of facilities	0.31	0.17	-0.07	0.28	0.60
Accumulation contribution to five factors (%)	55.59				

※W: welfare, M: medical, N: neighborhood
 NT: nature, S: shopping, E: education

Hypothetical Model is built, and is shown in Fig. 3. In Hypothesis Model, it is thought that "Individual attribute" which consists of "Sex", "Age", and "Transportation devices" affect "Living environment", and "Satisfaction" is prescribed by the actual condition of the living environment. Furthermore, it was assumed that "Satisfaction" influences "Settlement intention", and this affects "Importance of living environment".

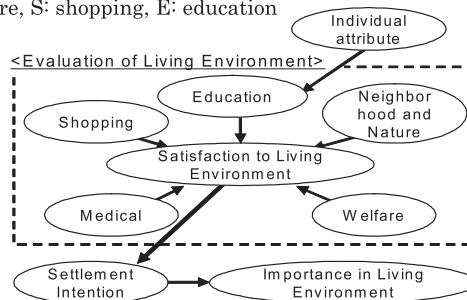


Fig. 3 Hypothetical Model

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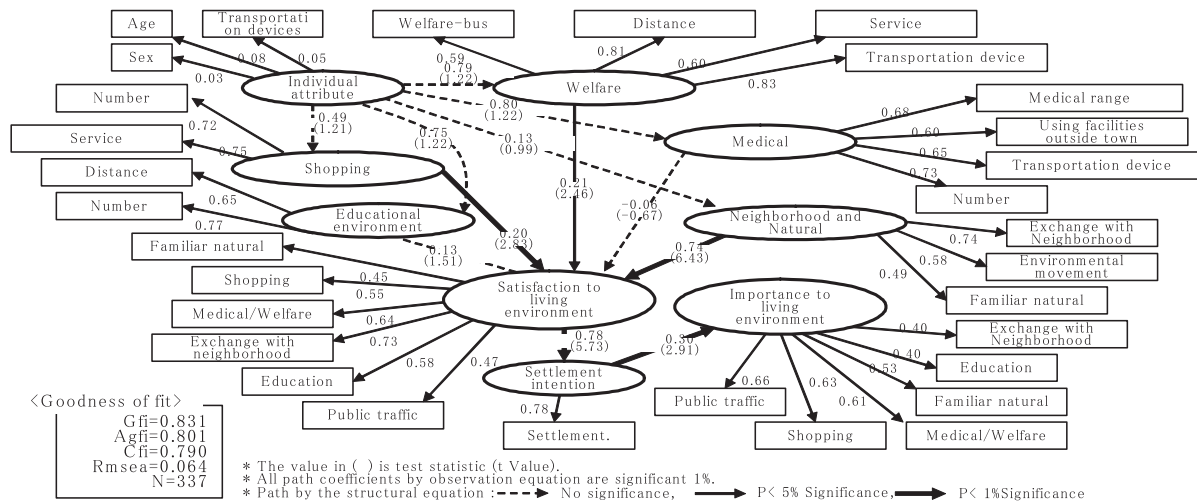


Fig. 4 Casual Structural Model (standard solution)

4.2 The interpretation of Casual Structural Model

Software package Amos5.0 was used for the presumption of Casual Structure Model. As the result of examining built Hypothetical Model, the goodness of fit adopted highest model. The result is shown in Fig. 4.

On the whole, it is affected to "Satisfaction" in order of "Neighborhood/Natural", "Welfare", and "Shopping". And this is connection to "Settlement intention", and affects "Importance of living environment". From above, it can be said that the improvement of "Satisfaction" by the improvement with emphasis on "Neighborhood/Nature", "Welfare", and "Shopping" leads to the improvement of "Settlement intention".

In inside, it can say that it is the strongest influence of "Neighborhood/Natural" and promoting "Exchange with neighborhood" through the town associations, the events, etc. using the familiar natural environment has the high effect in the improvement in "Satisfaction to the living environment". And it can read that for the improvement of "Welfare" and "Shopping", distance conquest with the adjoining city or the strengthening of move method through formation of traffic network etc. is important for the improvement of satisfaction. Moreover, it can be said that as the local resident had strong "Settlement intention" and the improvements of "Traffic" where the local inside and outside are connected, "Shopping", and "Medical and Welfare" are the importance as "Importance of living environment".

5. The improvement of the living environment

On above contents, the gradual improvement of the living environment is examined, and the image is shown in Fig. 5.

[The 1st Step] The strengthening of the public traffic network

The Suitable cooperation with bus to outside the town by a promoting of exchange with a circumference colony leads to conquest of migration length to a service which cannot but depend outside the town.

[The 2nd Step] The cooperation with commercial facilities outside of the town

By the cooperation with the commercial facilities outside the town, accessibility satisfied demand in the neighborhood to the commercial facilities outside the town is raised with the operation of shuttle-bus or demand-bus which connects the commercial facilities outside the town.

[The 3rd Step] The continuous maintenance and management of the medical·welfare base

It is desirable that extension of range which can receive supply of better service based on the continuous maintenance and management of the present facilities through the improvement in accessibility such as increase in the service of the town-bus and in substantial service of home-visit nursing care program etc..

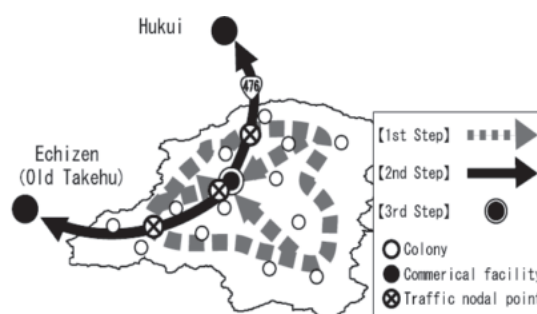


Fig.5 The improvement image

6. Conclusion

This study obtained the following results.

- (1) It is checked the improvement importance of the living environment and, grasped the evaluation to the living environment and the settlement intention from the resident viewpoints and the resident consciousness by grasp of local actual condition.
- (2) As the result of Casual Structure Analysis of the evaluation to the living environment and the settlement intention, it is clarified the relativity which the raising satisfaction to the living environment leads to the improvement in the settlement intention.
- (3) From the result of Casual Structure Analysis, the improvement course of the living environment which the residents wish is examined gradually, and the improvement of environment as shopping, medical and welfare is proposed centering on the public traffic environment.

Notes

- 1) "HOTO plaza" (comprehensive health care service welfare center) built in 2000 years is equipped with the Ikeda-town social welfare council, the Ikeda-town clinic, and the Ikeda town office health-and-welfare division from three sections of welfare, medical, and administration.
- 2) "NAKAMAGO" (town bus) started operation newly in 2006 uses school bus and citizen bus together, arranges bus stop to 45 neighborhoods and is carrying out the free operation of neighborhood for the town office.