

Analysis of the Closed Public Schools in Units of Local Governments in Chugoku District

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Abstract

In recent years, our country has been declining birth rate and many schools have been closed. Moreover, a large-scale municipal merger is performed. And it can call it the present condition that many of public schools have taken the measure of reorganization in each cities, towns and villages. The aim of this study is the construction of the database for the closed public schools in Chugoku District and declares the actual conditions of closed schools. The data for this paper are largely obtained from the School Basic Survey (Ministry of Education, Culture, Sports, Science and Technology). As a result, it turned out that the rate of a closed school becomes high in the local government where children's rate of decline is high in 50 years. In particular, it turned out that the rate of a closed school is high and the percentage of small-scale schools is high in the local government of the middle agricultural area and mountainous area. On the other hand in the local government of the urban area, it turned out that the rate of a closed school is low and the percentage of small-scale schools is also low.

Keywords: Elementary School, Closed public school, Process of Closing/Integration, Declining Birthrate, Chugoku District

1. Introduction

Recently, Japan has problems with the declining birth rate and aging population. It causes child decrease and urbanization and aging. And many elementary schools were consolidated. Particularly, the financial basis of local governments in depopulated area is weakened. And local governments merges into municipalities from city areas by the program of promotion of municipal from 2000 on. The number of cities, towns, and villages were reduced to about half by the great merger of municipalities in the Heisei era. With this, the optimal size of the public school and placement of appropriate arrangement are considered in each cities, towns and villages. Therefore, many elementary schools are consolidated by local governments.

However, the elementary schools and the school districts are familiar existences for local inhabitants through the long history by the education order of 1872, since it was established as a modern educational institution. At the present time, they are the important public properties for local inhabitants. In addition, in late years the community functions of elementary schools has been reconfirmed. Therefore, if more and more elementary schools are being closed down, the relationship elementary schools and local communities might be damaged. It disturbs the new transference of the child care generation if an elementary

school disappears in local community. Therefore low birthrate and aging are expected to accelerate even further in local areas. For these reasons, each local governments must avoid increase in closed school for education and local future.

The previous researches on closed school are as follows. Research on the occurrence factor of closed schools¹⁾, a study on the process of closed school and on reuse of the school facilities²⁾, a study on review of conversion about public school facilities³⁾, research on effect of building codes on conversion of closed elementary schools⁴⁾, research on facility management of closed public schools⁵⁾. Although some number of studies have been made on closed school as mentioned above, little is known about the actual condition by the areas and the process of closed school. Moreover, in rural planning, we shall take necessary measures, for not only urban areas but also rural areas including mountainous areas and their surrounding areas, taking such regional characteristics into consideration and promoting the

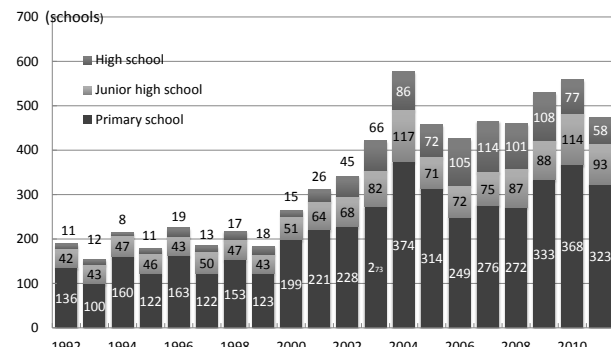


Fig.1. The number of closed schools of Japan for 20 years

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settlement of the people through improved living environment.

2. The purpose and method of research

In this paper, we clarify the character of Chugoku district in Japan. And the aim of this study is the construction of database about the closed public schools in Chugoku district and declares the actual conditions of closed schools. 1) We collected the basic information database (the number of the closed schools) of each metropolis and districts from 1992~2011 based on "About the survey of practical use situations, such as a closed school institution" that Ministry of Education, Culture, Sports, Science and Technology announced. 2) We organized these data (the number of the children and the schools) about each prefecture from 1968~2011 by the school basics investigation that it was statistics study of Ministry of Education, Culture, Sports, Science and Technology. In addition, we obtained the data of school basics investigation by each prefecture (Education Board). And we constructed the database (the number of the children and the classes) of each schools by diachronically from 1949 until 2011 in the Chugoku district.

The database about school streamlining of the Chugoku district was created based on the above information. Moreover we classify the time by changes in population of children of school age into 5 period. And we investigate the relation between the number of schools and the increase-decrease rate of schools based on municipal government district in 1960. Therefore, we categorize municipalities into 10 types based on the increase-decrease rate of schools and children. Then we analyzed the character of Chugoku district in Japan. Thereby we clarify the characteristics of the transition of the number of closed school by the period and region. Finally, we summarized the knowledge about school streamlining of the Chugoku district.

3. The Trend of closed school in Japan

3.1 Actual condition on closed school in Japan

Fig.2 and Fig.3 indicates the number of closed schools, and the rate of a closed schools for 20 years. There are most closed schools in the Tohoku district (855), and the rate of a closed school is also high (27.8%). In addition, the number of closed schools of the Kanto district is 584 schools. However, in the Kanto district in 2011, it have the most number of schools in Japan (5108 schools). And many new schools were established in Kanto district, too. Therefore the rate is 10.3% and the lowest value. This tendency is similar to the Chubu and Kyushu district. In short, the closedown rate is below the average.

On the other hand, in the Shikoku district, there is the least number of the closedowns. The number is 261 schools. However, the number of the schools of 1992 is the smallest. Therefore the closedown rate is higher than average. This tendency is similar to the Chugoku district. In Hokkaido, Tohoku, Chugoku and Shikoku district, the closedown rate is above the average. More than 20% of number of the schools of 1992 are closed down in 20 years. And in all districts, there are many closedowns in the areas far from downtown areas.

3.2 Closedown rate to watch according to a prefecture

Furthermore, the rates of closed school on prefectures for twenty years is more than 35% in Aomori and Akita which are

the highest in a closedown rate. In Hokkaido and Tohoku district, all local governments (except Miyagi) is above by 20%. And 20% of whole schools of 1992 are closed down. The Chugoku district is the area where the rate of a closed school is high. On the other hand, Most of prefecture where the rate of a closed school is low distributed in the Kanto district. And, these prefectures distributed in the Kansai district and the Kyushu district too. They are the prefecture containing ordinance-designated cities (except Okinawa Prefecture and Kagoshima Prefecture).

4. The trend of the number of children and the number of schools of the Chugoku district

Figure 4, 5, 6 and 7 indicate the change of the number of the children, schools, new schools and closed schools of the Chugoku district from 1960 through 2010. The population of Japan greatly changes by two times of baby booms. The first baby boom happened from 1947 through 1949, and the number of the children increased. Then the number of the children declines. Most of the branch schools are closed down then. However, the second baby boom happens from 1971 through 1974. The number of the children changed into increase again. The number of schools might be increasing at this time. However, the number of the children gradually decreases after that. The principal school gradually decreases with that.

By the scale of school children of prefecture in the Chugoku district, Hiroshima prefecture has the largest number of children. And then, the number of children is large in Okayama and Yamaguchi Prefecture. And Shimane Prefecture is the smallest. Hiroshima is different from other three prefectures. It is

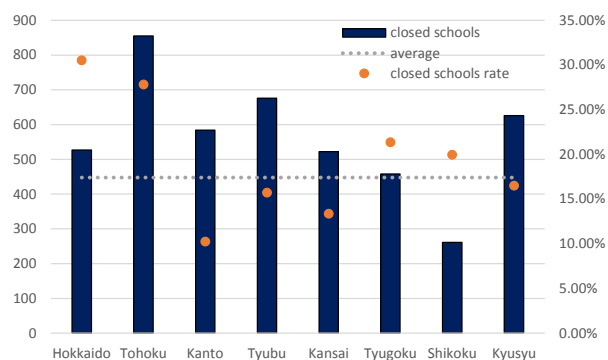


Fig.2. The number of closed schools and the rate of a closed school for 20 years



Fig.3. The rate of closed school for 20 years

characterized by the population growth at the time of the second baby boom. In addition, it was the same tendency in Okayama and Yamaguchi until 1965. Thereafter, Okayama has more number of the school children than Yamaguchi. In addition, the number of the children of Shimane hardly increases at the time of the second baby boom. Moreover, the number of children of four prefectures in the Chugoku district was classified at the time of the year which change increase for decrease. The time when children decrease rapidly after the first baby boom is named the I -period (1959~1973). Then the time when children increase by the second baby boom is named the II -period (1974~1982). And the time when children decrease after the second baby boom again is named the III -period (1983~1999). And the time children decrease by the Great merger of the Heisei is named the IV -period.

There is a similar slow tendency to decrease from II -period into III -period in the Chugoku district except Hiroshima. The number of school increases only in Hiroshima at the time of II -period. However, the number of school suddenly decreases in Hiroshima after III -period. In other prefectures, the same tendency to decrease of the number of the schools after III -period can be seen. As for the number of the children, the tendency in 1960 was the same in Okayama and Yamaguchi. But, in stage III, the number of school is difference (approximately 100 schools).

By transition of closed schools in each prefecture, there are many closed schools in the I -period. Especially a lot of the closed school of the branch school is closed at this time. And, few closed schools in the II -period and the III -period were consolidated. And, closed schools increase after a great merger of the Heisei again in IV -period. In particular, the tendency is characteristic in Hiroshima. There are many number of the closed schools in Hiroshima, Okayama. In addition, there are many new schools in Hiroshima, Okayama, too. In Okayama, many of them were established in I -period. And, in Hiroshima many of them were established from I -period into II -period.

5. The type of the local government using the increase-decrease rate of schools

For making the generating situation of the closed school clear, we performed cluster analysis using IV -period variables the increase-decrease rate of schools from I -period into IV -period. Thereby, we classified 315 local governments in ten types. Table.1 indicate the index mean of each type and Figure 8 indicates the distributed of each types. In A, many branch school closed in II -period. Especially, in A-1 and A-2, Most of them closed in II -period. In addition, about the increase-decrease rate of principle schools, there are many cities, towns and villages which the increase-decrease rate of schools significantly reduced in IV -period. In B, the increase-decrease rate of schools is high (-51.0%) in IV -period. Moreover, in C, the increase-decrease rate of schools is high (-53.9%) in IV -period. About B and C, the number of the children decreases more intensely than other types. and, the increase-decrease rate of child shows the negative value in II -period. In C, a lot of schools retained until IV -period. We considered that the local government closed it down for a policy after the government merged, and in C, The tendency of the increase-decrease rate of principle schools of D is similar to A. However, only the tendency of the increase-

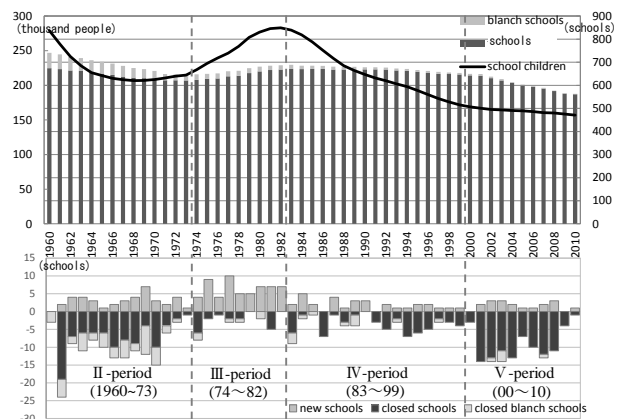


Fig.4. Children and schools of Hiroshima pref. (1960~2010)

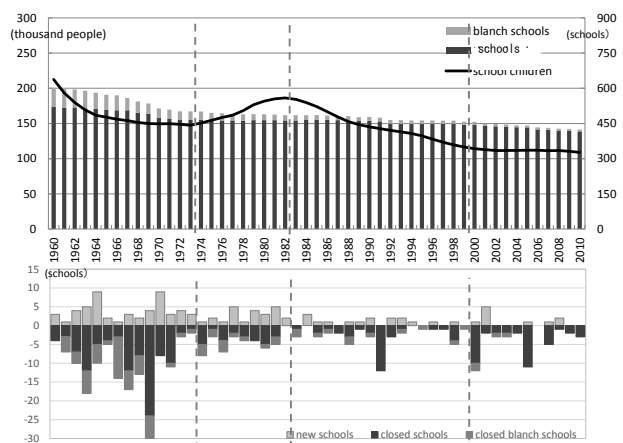


Fig.5. Children and schools of Okayama pref. (1960~2010)

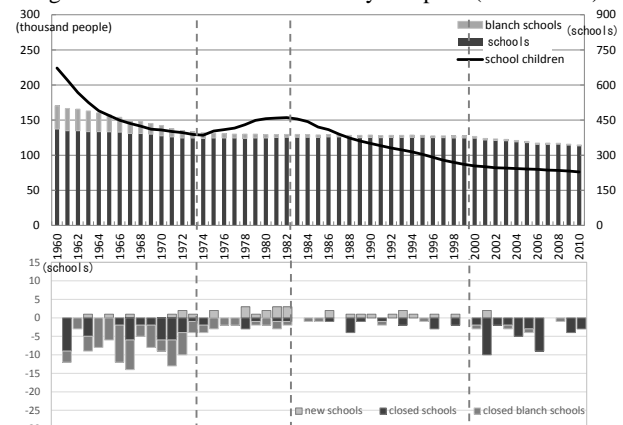


Fig.6. Children and schools of Yamaguchi pref. (1960~2010)

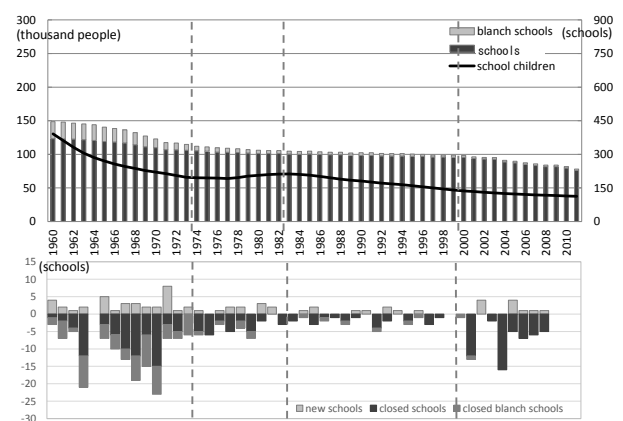


Fig.7. Children and schools of Shimane pref. (1960~2010)

schools gradually disappeared by decrease of children in III - period. Moreover most of B and C are distributed of each types. decrease rate of branch schools is different. In addition, in D-2, the number of the local governments owning approximately two schools during 1960 years are 52. A and D is scattered regardless of the geographical factor. E and F largely increases in II -

period, gradually becoming factor. The increase-decrease rate of schools and children of satellite town for cities.

Moreover there are a tendency to increase in number of the schools in Hiroshima City and Okayama City and surrounding towns and villages. Table.2 indicates the types classified in cities and towns and villages. In city, there are many A and D. And in

Table.1. Average value of the self-governing body type classified

Type	Local governments	Schools and branch schools	Schools	The increase-decrease rate of schools (%)					The increase-decrease rate of children (%)			
				I -period	I -2period	II -period	III -period	IV -period	I -period	II -period	III -period	IV -period
A-1	63	5.7	4.3	-9.4%	-99.4%	-0.8%	-4.9%	-12.2%	-53.7%	3.9%	-37.8%	-28.1%
A-2	19	19.4	17.4	-6.0%	-100.0%	5.5%	-4.4%	-9.2%	-31.2%	12.8%	-42.5%	-15.5%
A-3	33	11.6	8.8	-2.1%	-55.6%	0.2%	-7.2%	-12.9%	-49.4%	1.2%	-39.3%	-22.0%
B	30	6.1	5.9	-7.2%	0.0%	-3.0%	-9.0%	-51.0%	-54.6%	-7.2%	-45.3%	-30.9%
C	16	6.3	5.7	-6.0%	-3.1%	-6.2%	-53.9%	0.0%	-72.5%	-7.0%	-51.6%	-30.6%
D-1	61	5.5	5.2	-16.7%	3.0%	-9.2%	-0.7%	-2.6%	-52.4%	16.3%	-35.3%	-22.0%
D-2	52	2.0	1.9	-3.7%	0.0%	-3.5%	0.0%	0.0%	-36.7%	20.7%	-34.3%	-13.7%
D-3	17	13.3	12.4	-4.4%	8.8%	-1.8%	-3.1%	-6.6%	-40.5%	27.3%	-37.0%	-18.1%
E	17	7.8	7.6	-3.2%	0.0%	61.3%	13.7%	2.5%	33.1%	76.4%	-26.0%	1.3%
F	2	3.5	3.0	-50.0%	-50.0%	250.0%	16.7%	0.0%	79.6%	178.0%	-44.6%	3.7%

Table.2. Type according to cities, towns and villages

Type	Cities					Towns and Villages					Sum Total
	Hiroshima	Okayma	Yamaguchi	Shimane	Sum total	Hiroshima	Okayma	Yamaguchi	Shimane	Sum total	
A-1	0	0	2	0	2	13	11	14	23	61	63
	0.0%	0.0%	14.3%	0.0%	4.3%	14.1%	13.1%	34.1%	44.2%	22.7%	20.0%
A-2	6	4	6	2	18	0	0	1	0	1	19
	50.0%	33.3%	42.9%	25.0%	39.1%	0.0%	0.0%	2.4%	0.0%	0.4%	6.0%
A-3	1	3	3	3	10	3	3	8	9	23	33
	8.3%	25.0%	21.4%	37.5%	21.7%	3.3%	3.6%	19.5%	17.3%	8.6%	12.3%
B	0	1	0	0	1	18	7	2	2	29	30
	0.0%	8.3%	0.0%	0.0%	2.2%	19.6%	8.3%	4.9%	3.8%	10.8%	11.2%
C	0	0	0	0	0	8	7	0	1	16	16
	0.0%	0.0%	0.0%	0.0%	0.0%	8.7%	8.3%	0.0%	1.9%	5.9%	5.9%
D-1	1	0	2	0	3	18	21	8	11	58	61
	8.3%	0.0%	14.3%	0.0%	6.5%	19.6%	25.0%	19.5%	21.2%	21.6%	19.4%
D-2	0	0	0	0	0	12	29	6	5	52	52
	0.0%	0.0%	0.0%	0.0%	0.0%	13.0%	34.5%	14.6%	9.6%	19.3%	16.5%
D-3	4	3	2	2	11	4	1	1	0	6	17
	33.3%	25.0%	14.3%	25.0%	23.9%	4.3%	1.2%	2.4%	0.0%	2.2%	5.4%
E	1	1	0	0	2	14	1	0	0	15	17
	8.3%	8.3%	0.0%	0.0%	4.3%	15.2%	1.2%	0.0%	0.0%	5.6%	6.3%
F	0	0	0	0	0	1	1	0	0	2	2
	0.0%	0.0%	0.0%	0.0%	0.0%	1.1%	1.2%	0.0%	0.0%	0.7%	0.7%
Sum Total	12	12	14	8	46	92	84	41	52	269	315
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

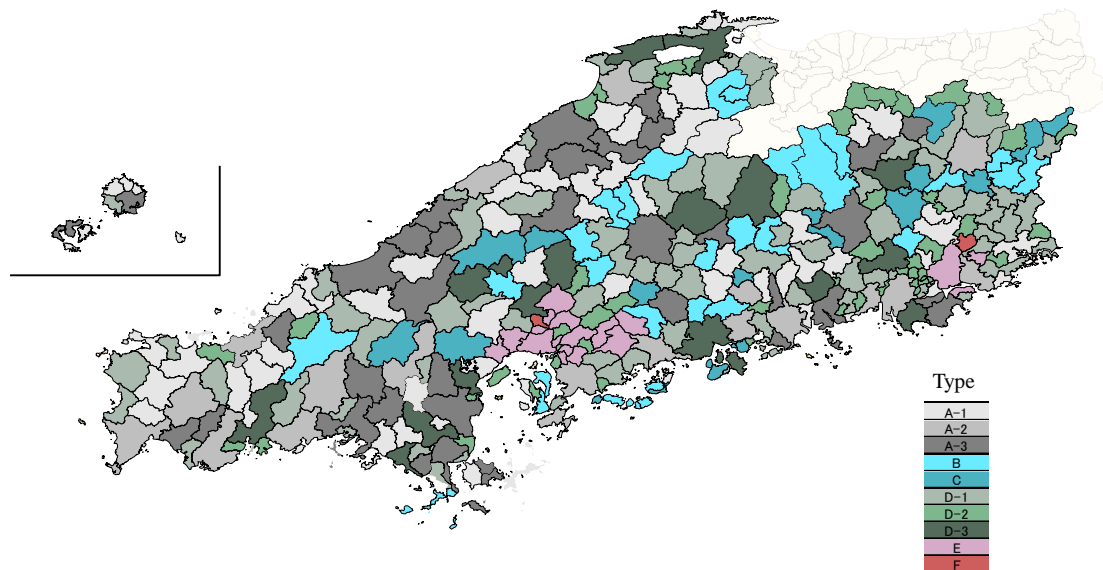


Fig.8. Distribution according to the type of the local government

Table.3. The agricultural area type

Type	Urban area	Level ground agricultural area	Middle agricultural area	Mountain agricultural area	Sum total
A-1	6	0	21	36	63
	9.5%	0.0%	33.3%	57.1%	100.0%
A-2	12	1	4	2	19
	63.2%	5.3%	21.1%	10.5%	100.0%
A-3	7	2	12	12	33
	21.2%	6.1%	36.4%	36.4%	100.0%
B	0	2	16	12	30
	0.0%	6.7%	53.3%	40.0%	100.0%
C	1	1	5	9	16
	6.3%	6.3%	31.3%	56.3%	100.0%
D-1	7	3	31	25	66
	10.6%	4.5%	47.0%	37.9%	100.0%
D-2	14	4	21	13	52
	26.9%	7.7%	40.4%	25.0%	100.0%
D-3	7	0	7	3	17
	41.2%	0.0%	41.2%	17.6%	100.0%
E	17	0	0	0	17
	100.0%	0.0%	0.0%	0.0%	100.0%
F	2	0	0	0	2
	100.0%	0.0%	0.0%	0.0%	100.0%

*1.Urban area: Cities, towns, and villages of DID area (5% or more) and Population density(500 people or more) and the population of DIDs.(20,000 people or more) *2.Level ground agricultural area: Cities, and towns, and villages of the arable land rate(20% or more) and the artificial forest rate(less than 50%). *3.Middle agricultural area: Cities, and towns, and villages of the arable land rate(less than 20%) and except Urban area and Level ground agriculture area. *4.Mountain agricultural area: Cities, and towns, and villages of the artificial forest rate(80% or more) and the arable area rate(less than 80%)

towns and villages owing the branch school, most of schools were closed in II -period. In addition, there are many D types (a few closed schools) in Hiroshima. And, there are many D types in Okayama too. There are many A types in Shimane and Yamaguchi. As for half of towns and villages, most of the branch schools are closed down for II period. In addition, there are not E type and F type in Yamaguchi, Shimane.

6. Character of the local government type

Table 3 indicates the agricultural area type for each local governments. As for A type, the rate of the intermediate and mountainous area (Middle agricultural area and Mountain agricultural area) exceeds 90% in A-1. And in A-3, the rate of the intermediate and mountainous area exceed 70%. However, there are many urban areas in A-2 (63.2%). Therefore the number of schools increased in II -period. As for B and C type, the rate of the intermediate and mountainous area is around 90%. Most of these local governments located in mountain region. Those 3 type there are many closed schools are similar in geographical conditions. Next, D type there are few closed schools, the rate of intermediate and mountainous area is approximately 90% in D-1. This is the cause that many schools closed more than D-2 and D-3 in I -period. In addition, in D-2, the number of the schools averages around two. However, the rate of urban area is high (26.9%). And there are many urban areas in D-3 (41.2%). As for E and F type, all of local governments located in urban areas. All of the local governments where the number of the children increased located in urban area.

7. Conclusions

- 1) The great merger of the Heisei in 1999 had great effect on the local governments. Thereby many schools were consolidated.
- 2) The number of closed schools in Chugoku district is not many

in Japan. But, the rate of closed schools is the third biggest because, there is few number of the schools originally.

3) The population of Japan is affected by the baby boom. In addition, the number of the schools of 3 prefectures except Hiroshima in the Chugoku district decreased gently.

In contrast, the number of the schools in Hiroshima increased in II -period. After that, the number of the schools decreases in IV-period.

4) The local government of the Chugoku district is classified to 10 type based on the increase-decrease rate of school in each period. The rate of closed schools of more than half of the local governments are low throughout all period. In contrast, there are some local governments the rate of closed school increasing. There are few closed schools in the local governments owing 2 ~ 3 schools.

5) We classified 10 type (by the cluster analysis) by geographical condition. All of the local governments where the number of the schools increased are located in urban area. In addition, Most of the local governments of B and C type are located in the intermediate and mountainous area. As for D-2, the local governments owing a few schools are located in urban area.

According to the above results, the tendency for the increase in closed schools were categorized several types. Therefore the community facilities operation according to social background and regional characteristics is required in future. The database of this study can be expected to be used for studies on the regional facilities planning based on the declining birthrate and aging society in Japan as the baseline material.

References

- 1) Fujino, T. and Aizawa, H. and Sugawara M. (2010) The cause of public elementary schools closing down and the subjects of them. J. Archit. Plann, AIJ, No649. 579-585.
- 2) Saito, N. (2008) A Study on the Closing/Integrated Process of Public Elementary/Junior High Schools and on Re-use of the School Facilities : The actual situation of closing/integrated schools for the past 30 years in Ibaraki prefecture and its effects on the rural communities, J. Archit. Plann AIJ.,No.627. 1001-1006.
- 3) Nozawa, H. and Taniguchi, G. and Tsunekawa, K. and Tabata E. (2010) A Study on Review of Conversion about Public School Facilities –In case of Aichi, Gifu, Mie, prefecture-, J. Archit. Plann. AIJ, No674.865-872.
- 4) Kono, M. and Yoshimura, H. and Yokota, T. and Iida, T (2006) IIDA : Effect of Building Codes on Conversion of Closed Elementary Schools : In the Case of Kyoto, Osaka and Kobe, J. Archit. Plann. AIJ, No609,47-52.
- 5) Yamamoto, S. and Nakazono, M. and Shimizu, S.(2012) Facility Management of Closed Public Schools: Survey Report of Closed Educational Facilities in Yamaguchi Prefecture, J. Archit. Plann. AIJ, No18(38).351-354.