

A Fundamental Study on Evaluation for Re-allocation of Urban Space Supplied by Re-development Projects

Takeshi HAYASHI* and Yasuo HINO**

(Received October 15, 2001)

Synopsis

This paper aims to quantitatively evaluate such effects of re-developing the urban area under each area-planning concept, based on some examples of re-development projects. As the result, their projects were classified into three types according to the ratio of supplied facilities, by using the factor analysis. In addition, the numerical indicators were developed and introduced to evaluate their projects according to each classified group. This evaluation method including the new indicators will be able to useful to plan these types of projects in future.

KEY WORDS: re-development, re-allocation of urban space, concept of area-planning, evaluation indicators, factor analysis

1. Introduction

Re-development project, including, the land readjustment is one of the effective method to improve the condition of built up areas, as well as supply public facilities such as, roads, parks, open spaces, and so on, systematically. Therefore, these methods will be hoped to be spread to supply higher quality urban-space.

Under this situation, in this paper, some kinds of effects obtained by such projects, through developing new indicators, were analyzed, based on 18 examples of projects in Osaka Prefecture, Japan.

2. Effects of re-development from viewpoint of supplying road facilities

Recently, it seems to be difficult to supply road facilities because of both the lack of space and the rise of land prices. On the other hand, many road facilities have been supplied by the re-development projects.

Figure-1 shows the change of the total road space and the ratio of road space supplied by re-development projects in Osaka Prefecture. From this, it is clear that the ratio of the road space supplied by re-development projects rises year by year, according to the increase of the number of such projects.

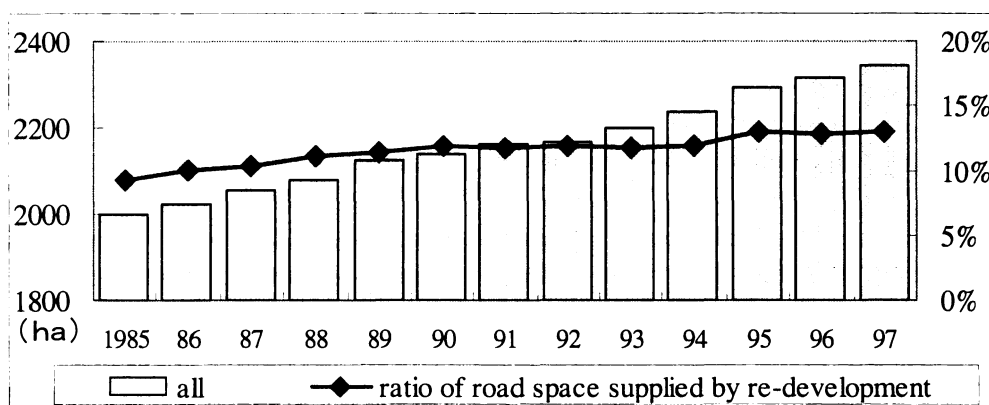


Figure-1 Change of the total road space and the ratio of road space supplied by re-development projects

* Student, Master Course of Dept. of Civil Engineering

** Professor, Department of Civil Engineering

3. Effects of road supply from viewpoint of "Area-Planning"

3.1 Relationship between land use planning and area planning

Figure-2 shows some examples of the land use ratio changed before and after the re-development project.

As shown in this figure, the ratio building sites become lower after project to supply the public space such as road, park, open space, and so on. As the result, the building lots should be used efficiently as the high-rise building. Generally, this ratio of public space must be evaluated as the quantitative effect of the re-development project.

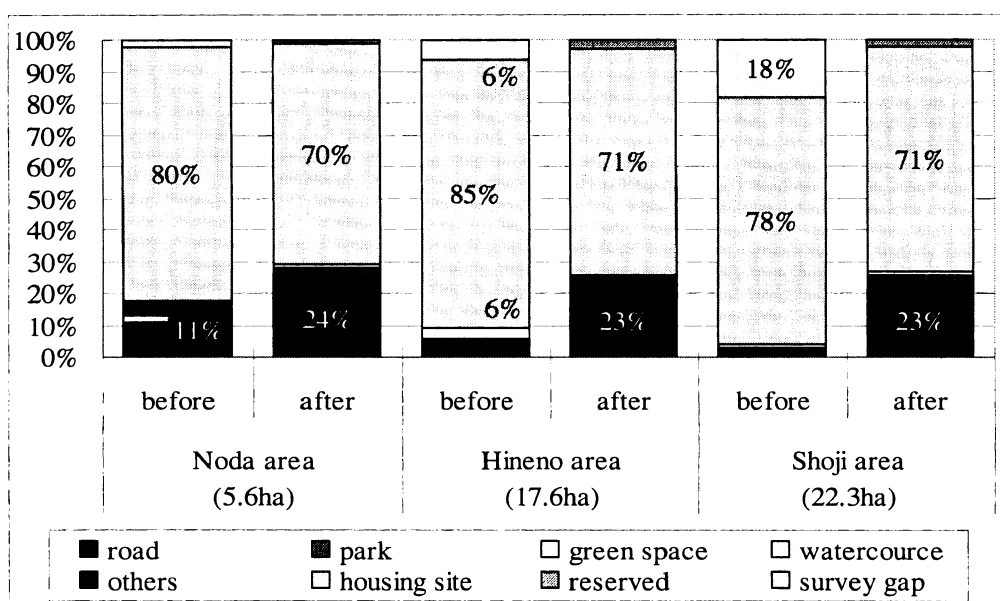


Figure-2 Some examples of the land-use ratio changed before and after the re-development project

3.2 The effect of re-development from viewpoint of "Human-space"

The ratio of public space has a great influence on the structure of area, which planned based on the concept of area planning. Especially, the open space, such as sidewalk, pedestrianized road and parks, should be evaluated as the "Human-space". Therefore, the differences of area planning concepts may be represented by the ratio of public space. Within cases in this study, the ratio of such human-space was generally more than 30%.

In future, the supply of more human-spaces must become important, according to diversification of sense of value and progress of aging.

4. Relations between "concepts of area-planning" and "quantity of supplied facilities"

4.1 Classification of each project

It is fully hard to express the characteristics of area planning concept only by the composition of land use. Therefore, in this study, the common factors of land use composition of each re-development project were selected by the factor analysis. Some major findings came out of this analysis, as follows.

As shown in Figure-3, the first factor loading took the positive value (1.04) only in the building site, and other values were negative. Therefore, the first factor can be interpreted as "the importance of the building use".

On the other hand, as the second factor loading took, the positive value in the watercourse, and the green site, this factor can be interpreted as "the importance of the natural environment" as shown in Figure-4.

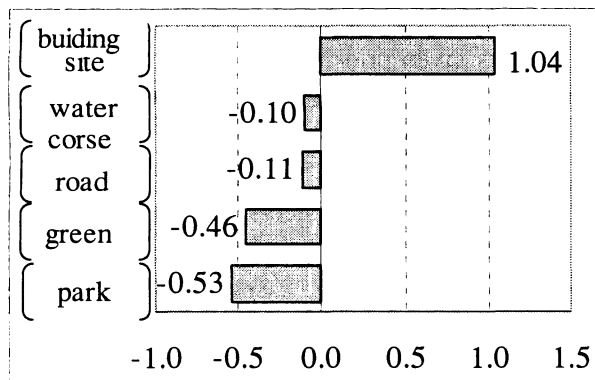


Figure-3 Value of first factor loading

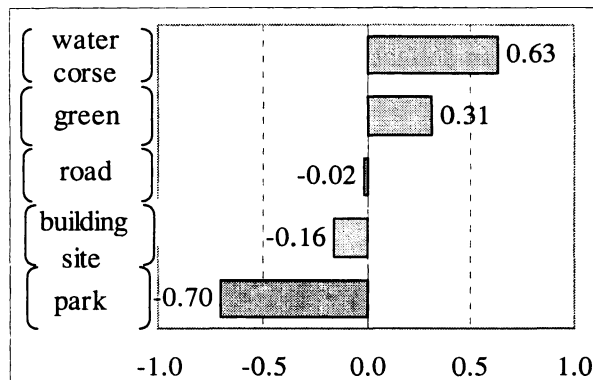


Figure-4 Value of second factor loading

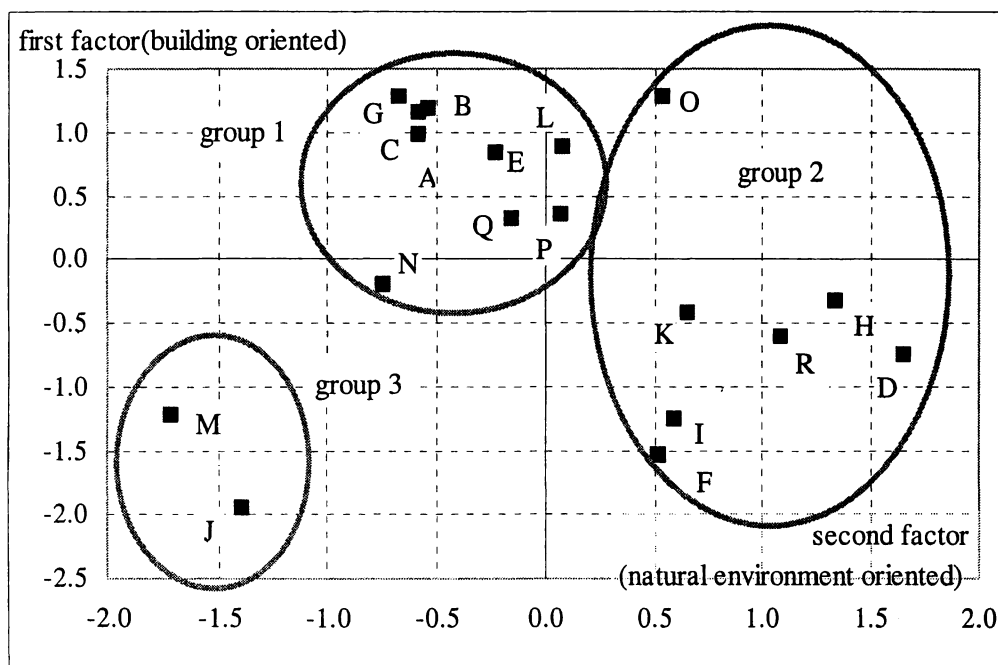
Furthermore, these were classified in three types by the cluster analysis as shown in **Figure-5**.

The characteristic of each type may be explained as follows,

1)group1:The building use oriented type (group1) ; The values of building use factors were positive in almost areas, though some values in the "environment factor" had a little dispersion.

2)group2:The nature conservation oriented type (group2) ; In this type, the values of environment factors were positive value, and almost all values of building use factors were negative.

3)group3:The public facility oriented type (group3) ; As both factors took negative values together, this type may be explained as "The public facility oriented type".



ID	Area
A	Hineno
B	Shoji
C	Higashi-Hitotsuya
D	Obu-Kumeda
E	Noda
F	Kanmaki
G	Kawachi-Iwafune
H	Kayano-Chuo
I	Onohara-Nishi
J	Kadoma-Minami
K	Minami-Eganosho
L	Nagasone
M	Nakamozu
N	Otori
O	Dai-2 Hanwa kokudo-Chuo
P	Hakotsukuri
Q	Shima
R	Uchigami

Figure-5 Distribution of factor loading points

4.2 Evaluation of prioritized facilities

It may be important to obtain the ratio of specialized facilities given priority to supply according to each area-planning concept. Then, the ratio of each land use areas was calculated at every group. As a result, in the group1 the ratio of local road area and pedestrianized road area was higher than others, the supply of parks and open spaces had priority over others in the group2.

Using these values, the composition ratio of prioritized facilities was calculated in each area as shown in **Table-1**. Recently, the human-space has had priority over other facilities as shown these examples. However even though, in group1, local road or pedestrianized road had priority in some cases. On the other side, in group2, especially the open spaces like parks had priority over others.

In this way, by using these values, the characteristic of both group and area should be easily obtained.

Table-1 Composition ratio of prioritized facilities

group	Project Area		Public facilities				Sum (%)	Human space (%)
			Arterial road	Local road	Pedestrianized road	Park		
1	A	Hineno	24	35	20	20	100	25
	B	Shoji	17	21	45	17	100	20
	C	Higashi-Hitotsuya	40	23	24	13	100	22
	E	Noda	20	32	13	35	100	29
	G	Kawachi-Iwafune	20	17	40	22	100	20
	L	Nagasone	19	47	11	24	100	22
	N	Otori	7	42	0	50	100	24
	P	Hakotsukuri	27	32	16	25	100	29
	Q	Shima	9	16	60	15	100	15
	GROUP1 AVERAGE		20	29	25	25	100	23
2	D	Obu-Kumeda	35	30	14	22	100	28
	F	Kanmaki	22	28	12	38	100	24
	H	Kayano-Chuo	26	15	37	22	100	27
	I	Onohara-Nishi	24	15	29	31	100	27
	K	Minami-Eganosho	12	35	18	35	100	21
	O	Dai-2 Hanwakokudo-Chu	28	21	42	9	100	11
	R	Uchigami	28	26	0	46	100	30
GROUP2 AVERAGE		25	24	22	29	100	24	
3	J	Kadoma-Minami	58	15	0	27	100	53
	M	Nakamozu	60	24	0	15	100	43
	GROUP3 AVERAGE		59	20	0	21	100	48
AVERAGE		25	25	25	25	100	25	

5. Conclusion

Major results of this study were summarized as follows:

- 1) It was cleared that in the most re-development projects, the area of building had decreased and used highly, in order to supply the public space such as road, park and open spaces.
- 2) Recently, the human space have had priority over other facilities like for car use.
- 3) The characteristics based on area planning concept may be represented by the ratio of public spaces, especially human-spaces.
- 4) As the common factors of land use composition of each re-development project, two major factors, which are interpreted as different types have priority to building use or natural environment, were selected by the factor analysis.
- 5) By using the value of this factor loading, types of re-developments were classified in three groups, that is, the building use oriented type, the nature conservation oriented type and the public facility oriented type.

- 6) The composition ratio of prioritized facilities was evaluated as the effective indicator to define the characteristic of area planning concept. However, as these results were based on a few practical examples, further data will reveal the firmly conclusions. In addition, the supply of other public facilities for administrative services, such as branch office, library, sports centre and so on, will be possible to influence to the characteristic of project, as well as some legal systems to regulate and guide to the desirable direction of development.

After completing these issues, some indicators based on enough data will become an effective to explain the concept of development to all concerned, or make better partnership with them to realize the desirable development.

Acknowledgement

The authors wish to acknowledgement data collection support from the department of city planning at the Osaka Prefectural Government.

References

- 1) The land readjustment magazine editorial council, 1996, *The history of the land readjustment project* (English equivalent, written in Japanese)
- 2) Bureau of Urban Improvement, Osaka Prefectural Government, 1998, *Urban development* (English equivalent, written in Japanese)
- 3) Bureau of Housing Policy, Osaka Prefectural Government, 1990, *The summary of the district plan system –for the livable area-planning* (English equivalent, written in Japanese)
- 4) *The land readjustment project plan document in Osaka Prefecture,*