A Study on the Computerization Construction Ability by a Special-purpose area

Sun-Woo Park, Young-Chan You, Chang-Hwan Park

***Abstract*—** Korean Legal System what is a special-purpose area is consistently decided and amended on law. Now, use zoning set a limit construction work on「Enforcement decree of the national land planning and utilization act」and 「Enforcement Decree of the Framework Act on Regulation of Land Utilization」. It is needed to computerization why is serviced a construction ability by use zoning, easily.

It computerize a pattern of a construction ability on 「Enforcement decree of the national land planning and utilization act」, but it isn't in 96 cases of 「Enforcement Decree of the Framework Act on Regulation of Land Utilization」. If these patterned data will use, it is sure to find a pattern of a construction ability in Enforcement Decree of the Framework Act on Regulation of Land Utilization」.

***Keywords*—**Application area, Building Usage, Computerization, Construction Ability

I. INTRODUCTION

Korea is one of the fastest urbanized countries in the world for the last 50 years. In the process, we faced many problems brought about by the indiscreet development of cities without guidelines. To solve these problems, the government regulates the development of the city as a policy measure. As the central law, the "National Land Basic Act" requires the development of policies and basic plans for the development of cities by separating the plans for the development of cities from a policy perspective. For the development of the city, the "Act on the Planning and Utilization of the Land" regulates practical development plans by limiting the detailed plans of land use and the use and scale of the buildings. Through these policy steps, the government provides guidelines for basic matters, and detailed plans are developed in detail to take advantage of the characteristics of the region, so that the land can be utilized.
This policy step became an opportunity for the public to passively participate in the process of real estate development, and caused the stagnation of small-scale real estate development. In order to overcome these problems, this study proposes a concrete method of providing numerical values for the use and size of buildings through web pages as a way to provide effective and intuitive laws and ordinances regulating real estate development projects to the general public.

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II. BACKGROUND AND NECESSITY OF RESEARCH

Due to the development of society and industry, the effective utilization of land is becoming an important issue all over the world. However, there is a tendency to focus on efforts to solve the problem by establishing a policy for it. In the case of foreign countries, this study is not considered because it is different from the policy direction of Korea.

One of the biggest problems in real estate development projects developed by individuals as a subject is complicated regulations on the land to be developed. The following is a survey on the social constraints of the real estate development project for 50 individuals who want to do a small-scale real estate development project. The result was the complicatedness of the law, the cost of the project, and the lack of necessity (see Figure 1).
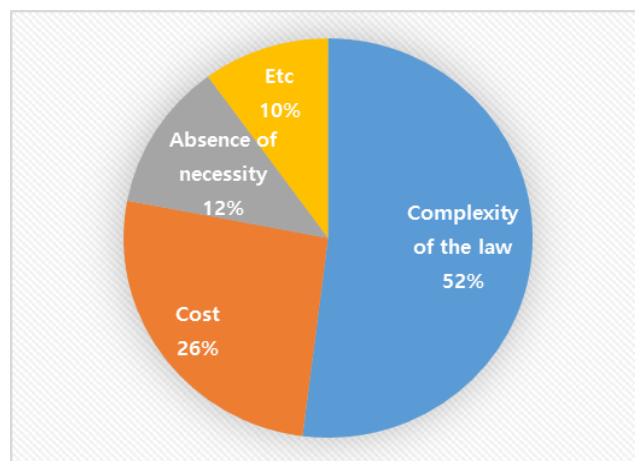

Fig. 1 Social anxiety factor rate of real estate developement

In addition, land use, the use of buildings, the size of buildings, and business feasibility were the first priority areas to be solved in the development of the land (see Figure 2)
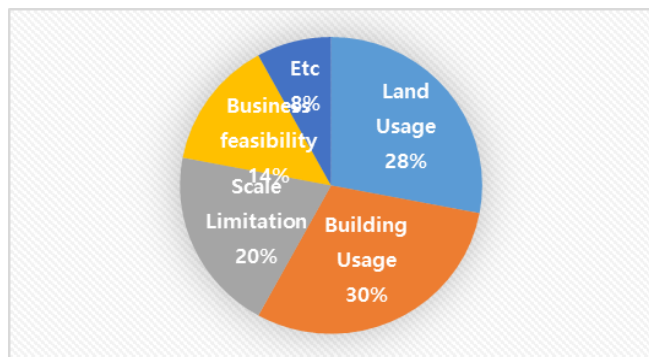
Fig. 2 Resolve factor rate of real estate development

As a result of the above, policy issues that hinder real estate development projects or hesitate about business plans are the most problematic. To solve this problem, the policy and social aspects are reviewed.

III. POLICY ANALYSIS ON THE IMPEDIMENT FACTORS OF REAL ESTATE DEVELOPMENT BUSINESS

In Korea, the application area is applied to the land. And usages are divided into 'Region', 'District' and 'zone'. Region is land use and the use of building, building coverage (we say the same as follows in " Building Act" Article 55), floor area ratio (say floor area ratio of Article 56 of "Building Act") To be used economically and efficiently, and to promote the promotion of public welfare. District is used for strengthening or alleviating restrictions on the use of the land, the use of the building, the coverage rate, the floor area ratio, the height, etc., thereby enhancing the function of the use area and promoting the beauty, scenery, safety. Zone is intended to prevent the disorderly spread of the city area by planning to strengthen or alleviate the restriction of the use area and the use area of the use of the land and the use of the building, the use rate of the building, It refers to the area determined by the "city / county management plan(we say the same as follows in "National Territory Act") for comprehensive adjustment and management. According to the National Land use Planning Act, the use of land is divided into 21 regions, 24 districts, and 4 zones, each of which limits the use and size of buildings(See Table 1).

TABLE I:
APPLICATION AREA

Application Area	Name of usage
Region	1. A class I exclusive residential area; 2. A class II exclusive residential area 3. A class I general residential area 4. A class II general residential area 5. A class III general residential area 6. A quasi-residential area 7. A central commercial area 8. A general commercial area 9. A neighboring commercial area 10. A circulative commercial area 11. An exclusive industrial area 12. A general industrial area 13. A quasi-industrial area 14. A green conservation area

Application Area	Name of usage
	15. A green production area 16. A green natural area 17. A conservation management area 18. A production management area 19. A planning management area 20. An agricultural and forestry area 21. A natural environment conservation area
District	1. A natural scenic district 2. A waterside scenic district 3. An urban scenic district 4. A central place aesthetic district 5. A historical culture aesthetic district 6. A general aesthetic district 7. A tallest height restriction district 8. A lowest height restriction district 9. An urban disaster prevention district 10. A natural disaster prevention district 11. A historic and cultural environment conservation district 12. An important installation conservation district 13. An ecosystem conservation district 14. A school facility protection district 15. A public facility protection district 16. A harbor facility protection district 17. An airport facility protection district 18. A natural settlement district 19. A collective settlement district 20. A residence development promotion district 21. An industry and distribution development promotion district 22. A tourism and recreation development promotion district 23. A complex development promotion district 24. A specific development promotion district
Zone	1. Limitations on construction in development restriction zones 2. Limitations on construction in urban natural park zones 3. Limitations on construction in urbanization-coordination zones 4. Limitations on construction in fishery resources protection zones

In addition, the city and county management plan not set forth in the National Land Planning Act is set by the Basic Law on Land Use Regulation. Regardless of the name, such as the area, district, area, area, complex, city, Land that is limited to the use and preservation of the land, such as restricting development activity or receiving authorization or permission related to land use (land which is connected with the land, (Hereinafter the same shall apply), as referred to in each subparagraph of Article 5. Construction restrictions on the areas, districts, and districts set forth in the Framework Act on Land Use Regulation are stipulated by the relevant laws and regulations, and the range is very large and there are many exceptions.

Regions, districts, and districts that are politically determined by these steps limit the use and scale of buildings in the law. In this process, it is necessary to consider the buildings for each use classified in 'Table 1 of the Enforcement Decree of the Building Act'. Therefore, after considering the limitation of the

buildings and scales used in the Table 1, it is possible to construct according to the usage area. Attached Table 1 divides the purpose-built buildings into 29 uses. (See Table 2) The classification system of the use of this building is applied equally to all laws and regulations of Korea and it must be applied in the construction.

TABLE II
CLASSIFICATION OF BUILDINGS BY USE

Buildings by use
1. Detached houses;
2. Multi-unit houses;
3. Class I neighborhood living facilities;
4. Class II neighborhood living facilities;
5. Facilities for cultural activities and assembly;
6. Religious facilities;
7. Commercial facilities;
8. Transportation facilities;
9. Medical facilities;
10. Education and research facilities;
11. Facilities for the aged and children;
12. Training facilities;
13. Sports facilities;
14. Business facilities;
15. Lodging facilities;
16. Amusement facilities;
17. Factories;
18. Warehouses;
19. Facilities for storage and treatment of dangerous substance;
20. Facilities for motor vehicles;
21. Facilities for animals and plants;
22. Resource recycling-related facilities;
23. Correctional facilities and military installations;
24. Facilities for broadcasting and telecommunications;
25. Facilities for power generation;
26. Cemeteries and related facilities;
27. Facilities for tourism and relaxation;
28. Funeral facilities;
29. Facilities for recreation;

In order to effectively provide the general public with such complicated real estate development policies, a system has been developed to provide public services to inform the general public about the maximum use and size of buildings that can be built on land for own or immovable development projects . This system was led by the government and constructed a database by computerizing laws and ordinances that divide the use area and the use building. In this database, service is being developed by developing an algorithm for the result desired by the user.

IV. NECESSITY OF COMPUTERIZATION OF RELEVANT LAWS AND REGULATIONS TO USE THE AREA

In the situation where the use and size of the buildings are determined according to the National Land Planning Act and the area and district under the Framework Act on the Regulation of Land Use, the part of building on the land owned by the general public must be assisted by experts. This may lead to the problem that the parties do not know the limits of the usable size of the building and the size of the building. To cope with these problems, we have developed a system to provide public services to inform the general public about the maximum use of buildings that can be built on their land. This system was led by the government, and the database was constructed by computerizing the laws and regulations that divide the usage area and the usage type. In this database, we will develop an algorithm for the result desired by the user and provide services.

Fig. 3 Classification and Scale Standard Extraction Method for Computerization of Table 1 of Enforcement Decree of the Building Law

In order to construct the database, the uses of the buildings are classified as much as possible and the size of each use is written in the form (see Figure 4).

Fig. 4 Based on form related the scale of items by the building usage

The items to be applied according to each application are the road (width, the length adjacent to the ground), the area (total of floor area < included sum>, total floor area <included sum>), height(stories, in meters), and Volume (coverage ratio, volume ratio). This item was created by taking into account the items that are restricted in the use area.

Fig. 5 Creation of a DB of the National Land Planning Act

The process of analyzing ordinances is necessary to analyze the items with the keyword of "bylaw" in an asterisk of the National Land Planning Act. Among the ordinances enacted by local governments, the ordinance related to the use area system is the Urban Planning bylaw. The Urban Planning Bylaw has items similar to the asterisks of the National Land Planning Act, and the method of constructing the Ordinance as a DB is the same as the method of constructing the DB of the National Land Planning Act.

The Land Use Regulation Framework Act summarizes the contents related to land use in Table 1 of the Enforcement Decree. And concluded that the statute should be analyzed in order to construct Table 1 as DB. As a result of analyzing the statute, it can be constructed as DB through the following process.

1) Search of provisions limiting the act of construction in the act

2) Keyword extraction that indicates the use, behavior, and scale of buildings that limit and analyze the articles

3) If you are delegating to another statute or ordinance, find the relevant article and repeat 2)

4) Based on the format shown in Fig. 5, DB items are extracted by keyword.

Fig. 6 Comparison before and after application of Bylaw

However, the process of establishing the DB of the Land Use Regulation Act is not finalized, so it is a possibility to explore the possibilities.

Fig. 7 Creation of a DB of the Land Use Regulation Framework Act

The written form was constructed using the number of local districts as determined by the National Land Planning Act, the use zone, the usage zone and the land use regulation basic law, and the database to which the ordinance delegated by the Land Use Planning Regulation Act and the Basic Law on Land Use Regulation Basic Law were applied. (See Figure 8)
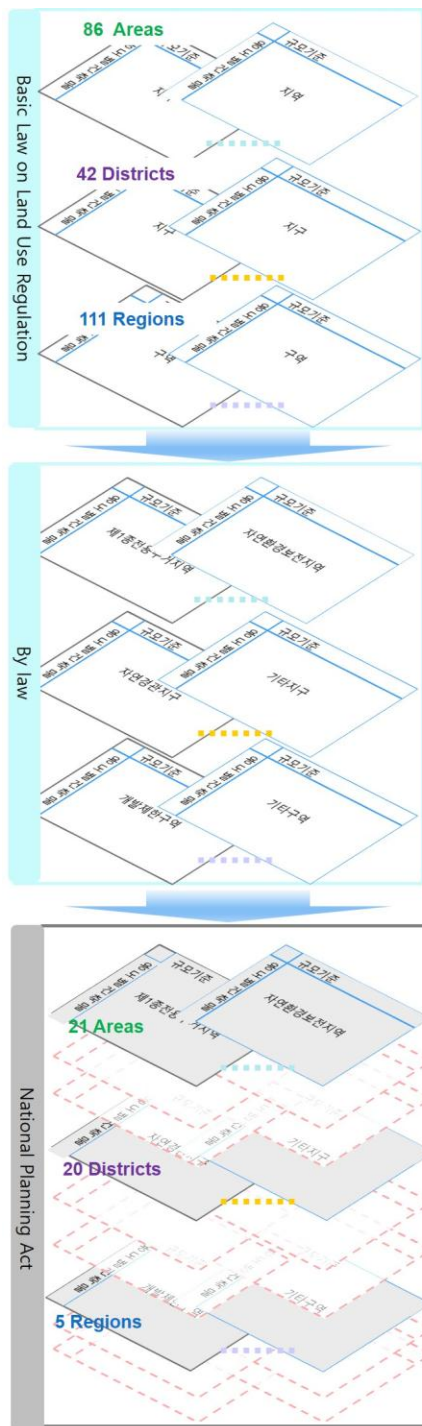
Fig. 8 Steps to build the database

V. Real Estate Development Related Laws And Regulations Based On Web Page

This service is currently focused on implementation and is in the testing phase. The problems identified in the test phase are the different parts of the building and the various variables depending on the statute. Due to the nature of the law, there are different uses and scales that can be built depending on the situation in the same use area. In particular, if a district plan is to be established, which is a higher plan than the use zone, it is necessary to follow the purpose and size of the district unit plan.

However, since the management of the district unit plan is managed by the basic autonomous entity.

In Korea, a system is provided to provide information on the use area of the corresponding lot according to the lot number. The service is provided free of charge by the government and is encouraging the use of the system. Since the service should be based on the information of the use local area, it is linked with the external system using the open API of this system. It is a service process that provides the scale of the application by selecting the use of the building in the database (see Figure 9).
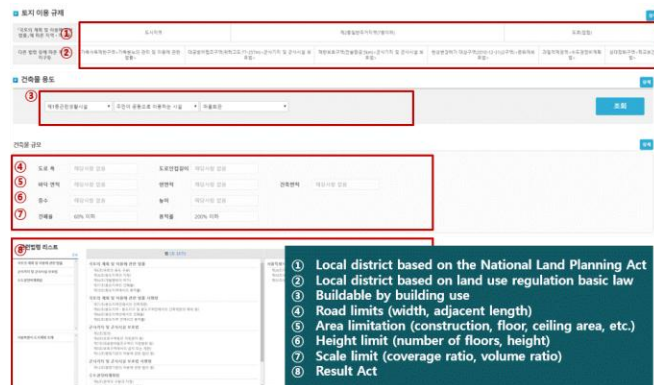

① Local district based on the National Land Planning Act
② Local district based on land use regulation basic law
③ Buildable by building use
④ Road limits (width, adjacent length)
⑤ Area limitation (construction, floor, ceiling area, etc.)
⑥ Height limit (number of floors, height)
⑦ Scale limit (coverage ratio, volume ratio)
⑧ Result Act

Fig 9. Service delivery process

VI. Conclusion

Since the general public is more important in the use of buildings according to the industry than the classification of the use of buildings, the following supplement is needed.

1) In the process of convergence of the classifications of buildings according to usage standard in Table 1 of Korean Standard Industrial Classification Table and Building Enforcement Decree.

2) The plan of district is reflected in the system and the feasibility to service it is examined.

3) Computation and applicability of databases of other functions such as exceptions, constraints and mitigations should be considered.

When the above completes, the use of public characters on this system is expected to increase.

Acknowledgment

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