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A SURVEY ON THE ACTUAL CONDITION OF ARCHITECTURE IN NORTH KOREA THROUGH INFORMATION ACQUISITION SYSTEM CONSTRUCTION

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ABSTRACT

It is necessary to respond in cooperation with North Korea in the architectural field as situation of the Korean Peninsula and the world starts to change with respect to North Korea. However, the special relationship between South and North Korea has made it difficult to exactly identify the North's situation and sufficiently conduct relevant studies. The purpose of this study is to build a North Korean architecture information acquisition system and seek cooperative methods in the housing field based on an investigation of the actual status of North Korean housing. A total of 11 experts were selected and the actual status of housing in North Korea was investigated. The results of this study are as follows. First, housing in North Korea is very scarce. Second, the quality of housing is important. Third, consider safety.

KEYWORDS: North Korea, Architecture, Housing, Information Acquisition.

INTRODUCTION

It is necessary to respond in cooperation with North Korea in the architectural field as situation of the Korean Peninsula and the world starts to change with respect to North Korea. However, the special relationship between South and North Korea has made it difficult to exactly identify the North's situation and sufficiently conduct relevant studies. In order to identify the actual conditions of buildings in North Korea, it is necessary to analyze sublaws, such as design standards. However, it is impossible to acquire any data on sublaws related to North Korean Construction Act. Existing studies are limited to the indirect information acquisition and the recapitulation of precedent studies. Such limitations create challenges when conducting in-depth analyses of the status of technology, such as technology standards.

Therefore, the purpose of this study is to build a North Korean architecture information acquisition system and seek cooperative methods in the housing field based on an investigation of the actual status of North Korean housing.

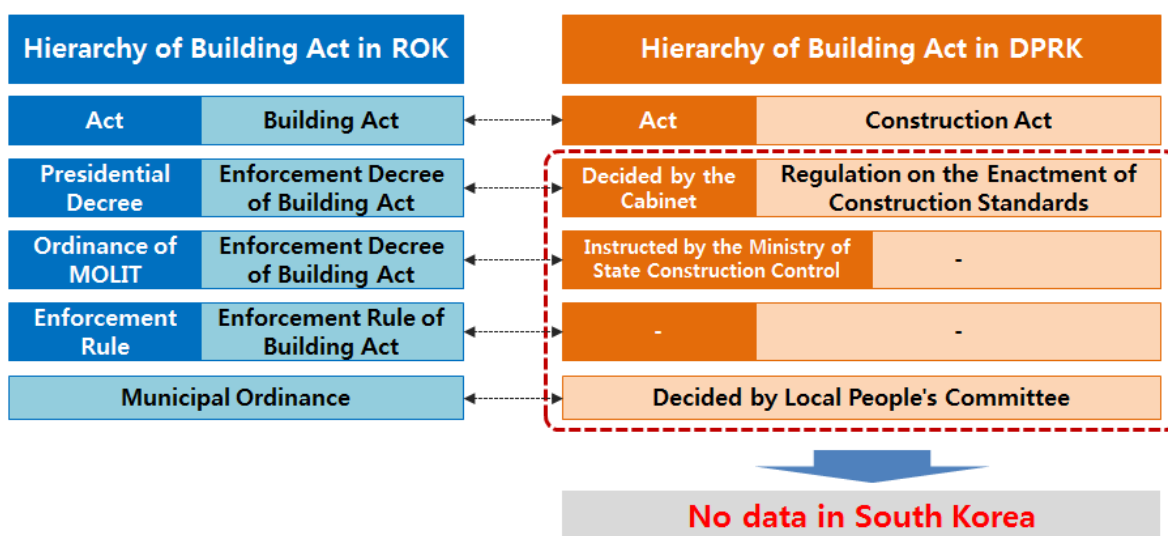


Figure 1. Background and Necessity of research

MATERIALS AND METHODS

Construction of a Network for Experts in North Korean Architecture

Prior to the investigation of the actual housing status in North Korea, relevant information and data were largely absent. It was necessary to configure a network of relevant experts and establish measures to acquire relevant knowledge and information first in order to collect such information. For the expert selection standard, the criteria was set to include only those experts who had an actual experience in engaging in building-related works in North Korea. A total of 11 experts were selected and the actual status of housing in North Korea was investigated by interviewing them 5 times. Housing-related literature materials were obtained through the experts and publishing companies specialized in North Korea. Also, it consisted of 18 domestic researchers on North Korean architecture and construction experts involved in construction projects in the North

To build a network for experts in North Korean architecture;

- Share North Korean construction-related information through the establishment of a network for architecture experts who defected from the North to the South.
- Exactly identify the current status of North Korean architecture and set a direction for technology development by conducting various studies and interviews.

Strategies for building networks are as follows;

- 1st Step: Recruit North Korean architecture experts who defected to South Korea as key members so that they can provide leadership and guidance for a North Korean architecture network.
- 2nd Step: Include architecture experts involved in construction projects implemented in the North
- 3rd Step: Extend the member network to domestic researchers on North Korean architecture.

CONSTRUCTION OF A NORTH KOREAN ARCHITECTURE INFORMATION ACQUISITION SYSTEM

Construction Training of a North Korean Data Acquisition System

The acquisition of materials on North Korea by South Korea can only be undertaken by 「Special Materials Handling Entities」. Because of this, the acquisition of such materials can, in general, only be undertaken when both the selling organization (agency) and the acquiring organization are Special Materials Handling Entities. Currently, the purchase of materials on North Korea is predominantly undertaken by South Korean companies, such as Nambook and Asia Journal, which are both Special Materials Handling Entities. It is, therefore, possible to acquire materials created in North Korea through such agencies.



Figure 2. Establishment of a North Korean construction-related internal information acquisition system

Establishment of a North Korean Construction-related Research Database

The classification system in the construction field from KDC Volume 6 (structure, civil engineering, construction and construction engineering) was used for DB classification system regarding information on buildings in North Korea. The configuration method to code collected building-related data in North Korea.

First, a manufacturing country is Alpha-3 code which is a country code consisting of three alphabet letters determined in ISO 3166-1. For example, South Korea is KOR and North Korea (Democratic People's Republic of Korea) is PRK.

Second, compose a number corresponding to each field by inserting the classification code by subject according to KDC.

Third, indicate the type of material with the initial consonant of alphabet.

- Book: B (Book)
- Magazine: M (Magazine)
- Research Paper: RP (Research Paper)
- Paper: P (Paper)
- Presentation material: PPT
- Collection of photographs: I (Images)
- Etc: E (Etc.)

Fourth, indicate the sequence number.

Fifth, indicate the year of document production or publication with a 4-digit number.

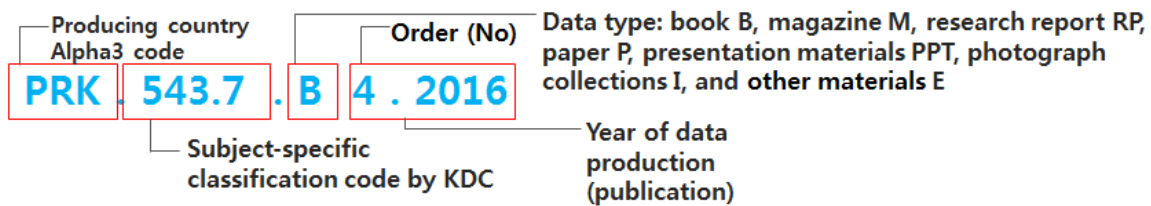


Figure 3. Coding method for North Korean construction-related data

DB classification according to the classification system by each subject of Architecture Fields in the 6th Edition of Korean Decimal Classification

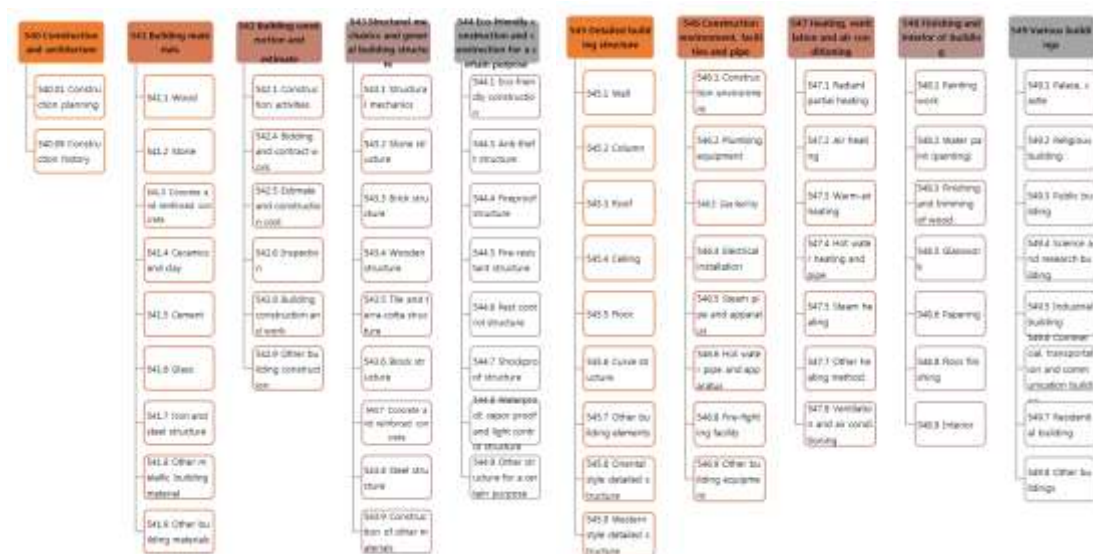


Figure 4. Subject-specific classification system

Establishment status of North Korean construction-related research data DB

Establishment of a database for North Korea's 1,066 items of research data related to architecture through November, 2017. Type of collected data: papers, books, research reports, magazines, and seminar presentation

materials. Data on land management, systems, current status, etc. comprise the bulk of the data. The number of technical analysis data is limited.

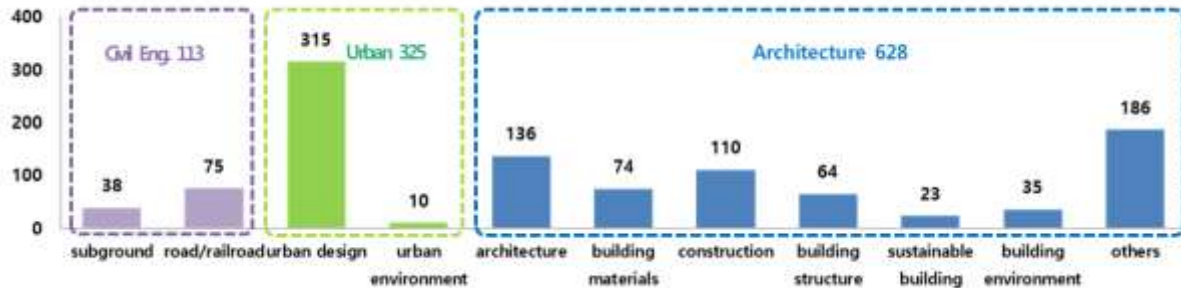


Figure 5. Establishment status of North Korean construction-related research data DB

SUMMARY OF INVESTIGATION OF NORTH KOREAN HOUSING

Quantity of Housing Stock in North Korea

Although the diffusion ratio differs depending on the research institute source and research period, the North Korean diffusion estimated at approximately 70%. North Korea is currently experiencing an absolute housing shortage. According to data from a North Korean architecture expert network, the shared household type accounts for 30%~40% of North Korean population. [1],[2],[3],[4],[5],[6]

Table 1. Quantity of Housing Stock in North Korea

	Yoon & Jang (1997)	LHI (2001)	NKEF (2002)	KRIHS (2013)	CERIK (2013)	LHI (2015)
Average number of persons per dwelling	-	4.8 (1999)	4.18 (2002)	4.3 (2006)	4.08 (2008)	4.4 (2015)
Number of households	-	48.5 million (1995)	48.0 million	53.7 million (2006)	58.8 million (2008)	59.0 million
Number of dwellings	36~39.2 million	26.9~30.4 million	28.8~38.4 million	28.8~38.4 million	41.2~44.7 million	34.5~47.2 million
Diffusion ratio of house	75.7%~83.1% (1993)	55%~63% (1995)	70% (1995)	77%~83% (2008)	74%~80% (2013)	58%~80% (2014)

Quality of Housing Stock in North Korea

Although North Korea released a population census national report in 2008, interviews with North Korean defectors revealed that the report contents were very different from the actual state of North Korean housing (i.e., The census report showed that the North Korean diffusion ratio of house was 99.8%. However, North Korean defectors said that the North Korean housing shortage rate was 30%~40%.) Most North Korean households reside in a house of 75 m² or smaller in size. The average number of rooms per person is 0.51.

40.6% of the total households use a pit latrine and 7% of the total households share a toilet. The primary source of energy for heating is coal (47.1%) and wood (45.1%). Urban areas and rural areas rely mostly on coal (64.3%) and wood (75.3%), respectively. [7],[8]

Table 2. Quality of Housing Stock in North Korea

	South Korea(2010)	North Korea(2008)
Average number of persons per household	3.3(14.17 million)	3.9(5.9 million)
Average number of room per person	1.3	0.51

Area distribution of the dwelling stock		
Ration of Owner-occupied dwelling	61.3%	-
Ratio of water supply in total dwelling stock	96.5%	85%
Ratio of Flush toilet in total dwelling stock	97%	59%

Changes in the Housing Supply Method

The 1990s was a period in which the economic crisis created difficulty in securing materials and labor. Consequently, the institutions or enterprises which gained the land use approval began using the capital of a new rich class known as "Donju" ("masters of money") to resolve the shortage in supply of materials and labor and to distribute apartments to "Donju" according to the level of financial contribution.

In the 2000s, a private real estate market was formed in which "Donju" borrowed the name of an institution to build houses and offered a reward to the applicable institution in the form of providing a certain proportion of housing units.

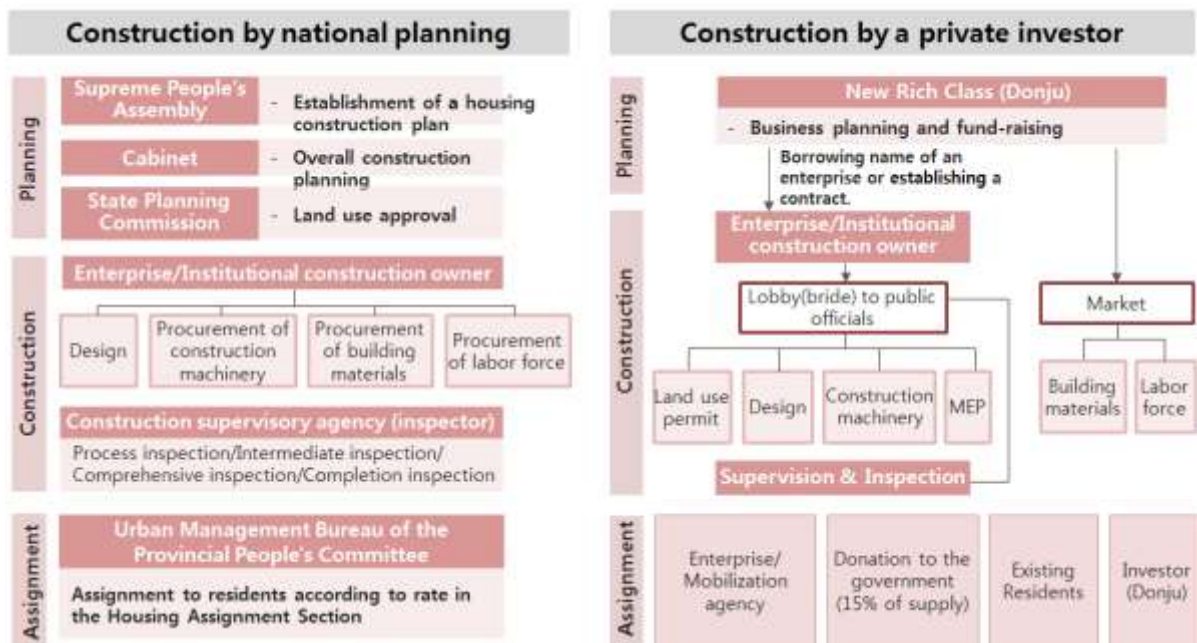


Figure 6. Establishment status of North Korean construction-related research data DB

Building Safety

Shoddy construction is prevalent due to lack of construction equipment and materials. Whether the supervision and inspection system works adequately is doubtful (no resident supervisor exists and fraudulent construction using bribes, etc. occurs frequently.)

The excessively rapid-paced construction projects intended to promote the North Korean government's performance raise concerns about building safety.



Figure 7. Establishment status of North Korean construction-related research data DB

RESULTS AND DISCUSSION

Although the North Korean socialist system operated smoothly through the 1980s, the economic crisis of the 1990s caused disruption to the economic and social structure. The North Korean authorities failed to adequately supply and manage housing, resulting in a housing shortage and poor residential environments.

The majority of existing houses are dilapidated or deteriorated dwellings. Moreover, most North Korean houses are expected to fall short of the South Korean minimum housing standard.

The actual conditions of houses in rural areas are particularly very poor. In this regard, there is a growing need for reconstruction rather than renovation.

A private housing market was established for North Korean residents to resolve such housing problems as housing shortage and deterioration on their own.

CONCLUSION

The results of this study are as follows. First, housing in North Korea is very scarce. Therefore, South Korea's capital, technology and North Korean manpower should be combined to come up with a new housing business model.

Also, South Korea's experience in large-scale housing projects should be shared, and guidelines, manuals and standards are needed. The government needs to establish an infrastructure for the North's rapid housing supply system.

Second, the quality of housing is important. We need to develop environmental improvement technologies that are best suited to existing North Korean buildings. It should also look for projects to improve the residential environment of humanitarian assistance.

Third, consider safety. The government should deliver systematic construction processes and standards utilizing the North's special economic development zone. We need to develop fast and accurate safety diagnosis and reinforcement technology for North Korean buildings. There is also a need for personnel exchange and training in the construction sector.

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