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Building Temporary Housing Facilities Complexes for Disaster Victims

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SUMMARY

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Chapter 1. Introduction

In recent years, South Korea has been faced with an increasing variety of disasters in terms of scale and form, resulting in greater impacts and an increase in the number of displaced people. The government provides various types of temporary housing for those affected, offering spaces where they can stay until their original living environment is restored.

However, due to the unprecedented scale of recent disasters, there have been cases, both domestically and internationally, where the number of people affected has exceeded the supply of temporary or prefabricated housing, forcing them to stay in shelters. In addition, the increasing scale of disasters means longer recovery periods, resulting in prolonged stays in these temporary shelters, which in turn negatively affects the stability of displaced people and their motivation to return to normal.

Adequate housing support for displaced people is essential to address the multifaceted challenges that they may face in the aftermath of a disaster, hence a critical factor in long-term recovery. It is necessary to ensure preparedness for the provision of

temporary housing as part of housing assistance for displaced people. These strategies should prioritize habitability for long-term recovery, rather than focusing solely on short-term relief.

In South Korea, the Guidelines for the Operation of Temporary Prefabricated Housing regulate relevant aspects. However, these guidelines focus primarily on the rapid installation and maintenance of individual housing units. In other words, there is a vacuum in the guidelines in terms of considerations for the planning and development of temporary prefabricated housing complexes in the event of a large-scale disaster and the subsequent need to accommodate displaced people in the medium to long term.

Against this background, this study aims to propose a plan for the establishment of temporary prefabricated housing complexes to support displaced people, with a particular focus on temporary prefabricated housing among various types of temporary residential facilities. The primary objective of this research is to propose the planning criteria and policy measures required to implement this approach.

Chapter 2. Support for Temporary Prefabricated Housing and Necessity to Build Housing Complexes

Chapter 2 focuses on case studies of building temporary prefabricated housing complexes to gain insights into the current state of temporary prefabricated housing complexes in South Korea and identify aspects where the development of such complexes can be facilitated through institutional support. This is followed by the rationale for building temporary prefabricated housing complexes in South Korea and spatial planning guidelines.

In South Korea, temporary housing is categorized into temporary housing facilities and rental housing under the Disaster Relief Act, the Public Housing Special Act, and the Emergency Welfare Support Act. The focus of this study, temporary prefabricated housing, is considered a temporary housing facility managed under the Guidelines for the Operation of Temporary Prefabricated Housing. Article 7 of the Guidelines (Duration of Assistance) provides that displaced persons may stay in temporary prefabricated housing until their damaged houses are restored or they are relocated to rental housing. Housing support is provided to individual households based on standard design drawings and specifications in the guidelines. In other words, there are no concrete grounds for local governments to provide housing assistance tailored to various

classes and demographic groups.

Second, there is a lack of pre-planning for the development of temporary prefabricated housing complexes. Currently, the provision and management of temporary prefabricated housing is done on a per-household basis without consideration for multiple units built as a complex. For example, there are no requirements for community facilities, medical facilities, or transportation assistance within such complexes, limiting the ability to create a fully supportive housing complex. In addition, the guidelines only provide authorization for the land use permit without specifying compensation, installation, and management. This poses further challenges to the development of complexes.

Third, there are inadequate provisions for situations where the restoration of original housing or relocation is delayed. Under current regulations, displaced persons may occupy temporary prefabricated housing for up to two years, but there is a lack of institutional support for longer stays, causing housing insecurity among them. Therefore, measures should be developed to address potential delays in recovery or relocation.

Living conditions in temporary prefabricated housing were examined in terms of location, housing, living environment, and sphere of living. From a location perspective, temporary prefabricated housing is safe and secure, but negotiating and securing land to build them takes a considerable amount of time. In the cases reviewed in this study, the site identification process was initiated as early as possible to ensure the safety of the displaced people. However, negotiating land use with landowners took a considerable amount of time due to the lack of regulations with clearly defined provisions for complex development and pre-planning.

From a housing perspective, occupants did not complain about the placement of the units, but there were issues related to size, functionality and convenience. Temporary prefabricated housing units built to standard design specifications and drawings were not considered to provide ideal living environments for people with mobility impairments due to the challenges of moving in and around the unit and storing mobility equipment. In addition, the nature of temporary structures makes these units vulnerable to extremes of heat or cold.

Finally, in terms of housing and living environment, most of the residents are elderly and had previously relied on village community centers as meeting places. It was observed

that even while living in temporary prefabricated housing, these residents continued to use the village community center as a shared facility. This suggests that public facilities that were in use prior to disasters are essential not only for promoting community interaction among residents, but also for providing practical services. In the event of damage or destruction during a disaster, it is crucial to either restore these facilities within the affected community or establish new ones.

Currently, the lack of a legal framework for the establishment of temporary prefabricated housing complexes in South Korea means that decisions regarding their establishment and occupancy are only reviewed after a disaster has occurred. These decisions are based on the specific conditions prevailing at that time. However, displaced people affected by the disaster may experience not only physical and psychological harm but also economic hardship and social disruption due to the loss of their previous homes and social networks. Home is one of the first spaces where individuals form emotional bonds, and losing this space can lead to profound feelings of loss, with potential negative social and psychological impacts. In this context, it is crucial to design, albeit temporary, these spaces thoughtfully to ensure stability for displaced people. Accordingly, in this study we propose key objectives for the development of temporary prefabricated housing complexes to support the stability and well-being of displaced people, drawing on research related to temporary prefabricated housing. First, safety is essential. Temporary prefabricated housing complexes built for displaced people must ensure the safety of both the individual housing units and the overall community environment. Second, convenience is important. This includes providing easy access to basic amenities and meeting minimum housing standards to ensure that residents can live without discomfort in an environment that accommodates diverse groups without barriers. Third, adaptability is necessary to meet long-term housing needs, allowing the temporary prefabricated housing complex to adapt to changing conditions. Finally, social connectivity is critical, as social capital has a significant impact on the health and stability of displaced people. The complex should be designed to support existing community ties or foster new relationships among residents.

Chapter 3. International Case Studies of Institutions and Spatial Planning for Temporary Prefabricated Housing Complexes

In Chapter 3, we examine how the objectives for the development of temporary

prefabricated housing complexes outlined in Chapter 2 are reflected in the contexts of other countries and how they differ from the current conditions in South Korea. Case studies were selected from the United States, which has experienced major disasters such as Hurricane Katrina; Japan, which has experienced frequent natural disasters including the Great East Japan Earthquake; and Turkey, which recently experienced a major earthquake. Focusing on these countries, we examine (1) policies and guidelines for temporary housing support and (2) the characteristics of housing complex developments. We also analyzed the characteristics of these housing complexes to identify policies and factors that should be considered when planning temporary prefabricated housing complexes for displaced people.

We analyzed the policies and case studies related to the establishment of temporary prefabricated housing complexes abroad from an institutional and planning perspective. From an institutional perspective, all three countries have detailed guidelines for the establishment of temporary prefabricated housing complexes that should be followed during the development of the complexes. In addition, they have a centralized disaster response organization and system that clearly defines the roles of various agencies and allows for a structured approach to the construction of these complexes. In particular, both the United States and Japan approach temporary housing not only as a short-term relief measure, but as part of a long-term recovery strategy. They use detailed guidelines to ensure a quick and organized response after disasters. For example, the United States conducts an annual review of the nation's inventory of temporary prefabricated housing, estimates needs, and arranges for additional contracts and purchases as part of pre-disaster preparations. In Japan, following several major earthquakes, local governments are instructed by the Cabinet Office to develop emergency temporary housing plans. These plans include preparation details such as roles and communication networks among relevant parties, information on potential construction sites, and layout plans for facilities and infrastructure.

In terms of planning, the analysis focused on location, unit design and complex layout. With respect to location, all countries placed a strong emphasis on safety to minimize secondary damage, while ensuring proximity to existing infrastructure and community areas for convenience. In the United States, there are additional requirements to minimize the environmental impact over the life of the complex. In terms of unit design, both Japan and Turkey offer a variety of prefabricated housing types to accommodate different household sizes and provide a range of standardized options. Japan uses

universal design for accessibility to support the mobility impaired, and the United States does the same by incorporating the Federal Accessibility Standards (UFAS) into its temporary housing. Finally, in terms of the complex layout, all three countries include community facilities within the complexes. Social capital fostered through relationship building contributes positively to the stability of displaced people, so the complexes are designed with community spaces and layout considerations that facilitate social interactions. In Japan, for example, community meeting spaces are provided and the complexes incorporate features to support people's daily activities, such as mobility assistance for the elderly and bus stops. In Turkey, essential facilities are provided in proportion to the size of the complex to meet the needs arising from the major disaster.

Chapter 4. Establishment of Temporary Prefabricated Housing Complexes for the Stability of Displaced People's Lives

In Chapter 4, we propose basic guidelines, design criteria, and policy tasks and strategies for the implementation of temporary prefabricated housing complexes to support the stability of displaced people's lives, based on the findings from the analysis of Korea's circumstances in Chapter 2 and international case studies in Chapter 3.

The quintessence of the development of temporary prefabricated housing complexes is the creation of appropriate living spaces, rather than simple shelter-like accommodations, in order to promote the stability of displaced people's lives. In this context, we propose planning directions and criteria for each spatial hierarchy in the establishment of these complexes. In addition, we discuss the need for policy tasks such as improving guidelines for the operation of temporary housing, defining the roles of key stakeholders, and establishing legal grounds to support medium- to long-term residency. Detailed strategies for implementing these recommendations are also presented.

In South Korea, there are no detailed zoning guidelines specifically for the development of temporary prefabricated housing complexes, and these complexes are built as circumstances allow after a disaster. This lack of standards could lead to problems in supporting long-term housing that promotes the stability and recovery of displaced people, especially in the case of a large-scale disaster or when temporary housing needs to be built as complexes. This justifies detailed spatial planning guidelines for the development of complexes. Site selection should prioritize safety from secondary disasters and exclusion of high-risk external areas, and should consider accessibility to

existing communities and necessary daily living resources. Individual units, where residents spend most of their time, should be provided with a variety of configurations based on household composition to enhance comfort, as well as minimum standards for sanitation, safety, and other essentials. Finally, for complex layouts and arrangements, plans should consider long-term residency and continuity with displaced people's former lives, with design features that facilitate ongoing social connections. Based on these spatial planning principles and the findings of Chapters 2 and 3, we propose the following planning criteria.

Space-specific considerations for the development of temporary housing facilities complexes

		Safety	Convenience	Comfort	Sociability
Location	Exclude areas of risk and vulnerability to secondary damage	●			
	Distance and accessibility to existing amenities and residential areas		●		●
	Areas to accommodate infrastructure and to set up and take down a temporary housing facilities		●		
Individual units	Fabrication in various standard types (installation depending on household size)		●	●	
	Facilities and equipment needed by individual household members		●		
	Facilities and capabilities to protect residents from crime, disasters, and other risks	●			
	Barrier-free design for mobility disadvantaged populations	●	●		
	Design that allows for spatial improvement depending on residents' convenience and needs		●	●	
Complex	Living units and hierarchical space planning in consideration of potential expansion of the complex and extension of stay		●	●	●
	Internal evacuation routes and fire roads for ease of response in the event of a fire	●			
	Layout of the main drive and related facilities with caregiving needs in mind		●		●
	Community spaces, amenities, and services for residents		●		

Note: See the appendix for preceding studies referenced.

Source: Authors based on the considerations suggested in the preceding studies.

Based on the proposed planning criteria, this study proposes alternative layouts for temporary prefabricated housing complexes in South Korea, moving away from the conventional grid layout to designs that are consistent with the goals of the study, such as living-street-type and care-enhancing layouts. The pilot applications show that

while the grid layout is efficient for the organized placement of supplies and vehicles on sites of various sizes and shapes, it is limited in reflecting the intended goals of these housing complexes. In contrast, the layouts proposed in this study allow for the creation of outdoor spaces that promote sociability. However, they may have limitations in terms of privacy. Therefore, it is important to consider both the advantages and disadvantages of each layout and apply different configurations depending on the characteristics of the displaced people and site conditions.

The detailed policy tasks for implementing the proposed complex design standards are as follows. First, it is essential to establish a foundation for the pre-planning of complex designs. Detailed guidelines should be developed for the ex-ante preparedness and ex-post response phases to facilitate disaster preparedness. In the preparedness phase, this study suggests: ① estimating the need for managing prefabricated housing stock for displaced people and reviewing the basic conditions and available sites by region, ② forming agreements and delineating roles among stakeholders, and ③ developing housing and facility layout plans based on planning standards tailored to local conditions. In the response phase, it proposes: ① identifying the specific needs of displaced people who require prefabricated housing in designated temporary housing sites, and ② selecting sites and creating complexes through site assessments while implementing programs to ensure resident safety and promote recovery.

Phase-specific considerations for complex development

Phase		Preparations
Ex-ante preparation	Site review and selection	<ul style="list-style-type: none"> Review baseline conditions and consider available sites. Manage a shortlist of potential sites for the development of a temporary prefabricated housing complex. Evaluate requirements such as site ownership, accessibility, topographic stability, and natural disaster risks. Negotiate preliminary agreements for public and private sites.
	Cooperative system building	<ul style="list-style-type: none"> Build networks with local architects, developers, and others. * Establish roles and a rapid response system in the event of a disaster.
	Development planning	<ul style="list-style-type: none"> Establish a preliminary complex development plan based on the suggested planning criteria by spatial hierarchy.
	Setting up a complex	<ul style="list-style-type: none"> Prepare a plan that reflects the temporary housing design guidelines for manufactured homes.
	Demolition plans	<ul style="list-style-type: none"> Review home recovery plan of victims and Develop demolition and utilization plans based on eviction scenarios
Ex-post	Disaster	<ul style="list-style-type: none"> Analyze the demand for temporary housing home occupancy

Phase		Preparations
response	victims characterization	and demand for needs related to disaster victims' living * Identify the number, family composition, age group, health status, and other characteristics of displaced people living in temporary housing, as well as the special needs of vulnerable groups (elderly, disabled, children, etc.)
	Site selection and development	<ul style="list-style-type: none"> • Evaluate shortlisted sites to select a final site. • Develop a complex based on the site planning requirements and displaced people's needs.
	Complex operation and management	<ul style="list-style-type: none"> • Provide psychological counseling, medical support, and educational programs to help displaced people stabilize their lives and restore their daily routines. • Establish a security system within the complex, regular safety inspections, and maintenance plans.

Source: Authors.

Second, building a complex based on pre-disaster planning requires clarifying the roles of each stakeholder in the post-disaster temporary housing support system. Currently, roles are defined with a focus on disaster relief and recovery of individual facilities. However, the lack of support roles and content specific to complex facilities may limit the ability to provide rapid assistance in real-world situations. To address this, this study proposes specific roles for stakeholders within the current temporary housing support system for the development of complexes.

Finally, detailed regulations are needed to prepare for prolonged recovery periods, such as planning for mid- to long-term housing, phased planning for complex establishment depending on the scale of the disaster, and post-disaster management and use of temporary housing complexes. This study proposes the necessary considerations for these aspects.

Chapter 5. Conclusions

In a context where various disasters are occurring in the country and abroad, causing unprecedented damage, the responsibility of the state, as stipulated in the disaster safety laws, goes beyond minimizing the damage to help restore daily life. The significance of this study is that it proposes a strategy for the construction of temporary prefabricated housing complexes to ensure the stability of displaced people's lives and support their return to daily life. The guidelines and standards proposed in this study are expected to serve as a practical reference for future temporary prefabricated housing complex projects.

As a foundational study on the development of temporary prefabricated housing, this study was limited in proposing specific methodologies or detailed examples for practical implementation in the local context. Future research should build on these basic guidelines, taking into account different regional conditions and types of disasters, to develop concrete site selection strategies and planning guidelines.

In addition, this study focused specifically on temporary prefabricated housing among various types of temporary residential facilities. Future research should broaden its scope to examine different housing options for displaced people, including an in-depth review of temporary housing provided to individual households. In doing so, future studies could explore ways to develop a national housing assistance strategy that includes recommendations on the use of different types of housing to meet the needs of displaced people.

Keywords

Disaster, Displaced people, Stability of living, Restoration of normal activities, Liveability, Temporary housing facilities, Temporary housing facilities complexes