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Development of the Evacuation Support System for the Socially Disadvantaged Group: Focused on the Fire Disaster in the Public Facilities

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A B S T R A C T

This study investigated the policy characteristics in the extension of the disaster management policy for the socially disadvantaged based on the characteristics of safety management in the US building safety management and fire fighting laws. Since the purpose of preparing an evacuation system in case of fire for the socially disadvantaged is to establish a tight safety net that considers the various disaster vulnerabilities of the socially underprivileged, rather than finding a consensus at the general level, a sufficient discussion process was prepared and should be sufficiently reflected the positions and problems of the socially disadvantaged group. And it is necessary for the subject of preparing the safety management plan or evacuation plan to prepare a plan that takes into account the fundamental characteristics of the socially disadvantaged of the facility or the structural characteristics of the building. Finally, it is necessary to periodically check the safety management plan and the effectiveness of evacuation measures in the facility through scenario-based training involving socially disadvantaged groups.

Key words: socially disadvantaged, fire disaster, public facilities, evacuation, USA

Introduction

Since the revision of related laws in December 2017, Korea has obliged to install safety facilities, fall risk tags, and alarm sound generators at emergency exits below the 4th floor of public facilities. However, after an accident in Cheongju in March 2019 in which five adult men fell and died, a check on the implementation of the Chungbuk Fire Department revealed that 64% of the multi-use businesses did not have fall prevention facilities. This corresponds to 481 out of 750 multi-use establishments subject to safety facility installation, and in fact, it is understood that the risk remains even greater when expanding to the entire public facilities in the legal dead zone.

Moreover, the recent series of social disasters combines the vulnerabilities of natural or artificial environments with the characteristics of vulnerable social groups, proving that the effects of disasters are not uniform to all people and can cause greater damage to the socially underprivileged. A recent the Yeosu Immigration Office fire in Jeonnam in 2007, Pohang care center fire in Gyeongbuk

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in 2010, the Goyang Terminal fire in Gyeonggi in 2014, and Jecheon sports center fire, the largest public facilities fire in Chungbuk in 2017. The Sejong hospital fire in Miryang in 2018 is raising awareness of the relative dangers of disasters among the socially underprivileged as disaster safety vulnerable groups. In addition, fire accidents at public facilities occupied by socially disadvantaged groups such as postpartum care centers, daycare centers, and gosiweons that occurred in Korea between 2018 are the disaster safety vulnerable class. It is asking for verification of improvements.

In particular, after a series of accidents, the main point of the firefighting and disaster prevention experts is that the firefighting system responsible for the prevention and suppression of fires in the building and the building-related legal system responsible for the safety of evacuation facilities and structure structures in case of fire are 'separate soup meals'. It is difficult to affirm whether sufficient consideration for the socially underprivileged is being made in a situation where even the safety of the facility itself is being pointed out, such as pointed out (Pressian, 2018. 01. 29.), the consistency of the institutional system for safety management is pointed out.

In addition, among the buildings built before the enforcement of the Fire Protection Facility Act, that is, before 2004, there are 13,377 small-scale accommodation facilities such as inns nationwide, so it can be said that economically vulnerable groups also have a relative vulnerability from disaster safety.

Therefore, this study analyzes the problems of the fire evacuation system that considers the public facilities of the USA within the framework of the government's fire disaster safety management legal system for public facilities, and manages them through comparison between countries. We intend to find ways to strengthen measures. In detail, in the event of a large-scale fire, focusing on public facilities where many of the socially disadvantaged reside or use, it intends to analyze the policy trends of evacuation plans and preparations for the socially disadvantaged to come up with an institutional improvement plan.

Theoretical Background

Public Facility Fire and Socially Disadvantaged Group

Concept of Public Facilities

Public facilities are special security target facilities in which a large number of unspecified public participate, and if a high level of expertise and integrated safety management measures are not prepared, enormous human disasters can occur. In addition, as the leisure life of citizens is increasing and cultural experiences are increasing day by day, safety measures should be prepared to prevent various predictable accidents in pubic facilities and to ensure that citizens can use the facilities safely (Kim & Cho, 2011: 6). However, in the case of Korea, although public facilities are terms commonly used in the field of disaster safety (Park, 2018; Lee, 2018; Yoon, 2018; Choi, 2018; Kim, 2018), there are differences in the use of terms between laws, so it is difficult to uniformly define them.

In general, the term dealing with building facilities means multi-use facilities, but in terms of disaster safety management, it includes multiple dense facilities. And as a facility subject to management by the competent department, it contains buildings that are in the legal blank, but have a high risk of damage in case of an accident.

Therefore, in practical terms, the terminological concepts of multi-dense facilities and multi-use facilities are the same, but buildings used by an unspecified number of people can be comprehensively defined in consideration of legal gaps. In particular, as the conceptual scope of public facilities is very wide, this study focuses on facilities for the elderly, including multi-use establishments, health facilities, medical facilities, and social welfare facilities.

Disaster vulnerability of the Socially Disadvantaged Group

Categorization of types for the socially disadvantaged is not as easy as the complexity and broadness of the types of public facilities. Recognition of the socially disadvantaged has changed in accordance with the trend of society from the past to the present in concept, content, and type, and in modern society it is not easy to clearly define who can be the target of the socially disadvantaged.

The socially disadvantaged refers to things that are related to or have social characteristics, and refer to emotions, personalities, values, etc. Therefore, the socially disadvantaged can be defined as a person with vulnerability from a social point of view among members of the community, but this is also a variable term.

In general, the socially disadvantaged refers to a group that is disadvantaged due to its low socio-economic status, but is also referred to as the vulnerable, marginalized, and low-income class as a similar concept. While pointing out that the standards are ambiguous, people in the community who are treated as weak from a social point of view or those who need protection of the community are defined as socially disadvantaged (Sim, *et. al.,* 2016: 27-28). And the discussion on the types and categorization

of these socially disadvantaged people is being used as a term for the underprivileged, disaster-safe underprivileged, or disaster-safe underprivileged class in terms of disaster safety management (Hong, 2016; Choi, 2016; Lee, 2016; Oh, 2018; Park, 2018; Park, 2018; NHRC, 2018; Bae, *et. al*., 2018).

NDMI (2010) categorizes the concept of the disaster vulnerable into economic, physical, and environmental aspects, and defines it as a person who is vulnerable to disaster. NDMI (2012) defines the concept of the safety weak as a person or class who is easy to suffer damage from disasters and accidents or has difficulty recovering from the damage received. On the other hand, based on what is classified into disaster management and safety management in the 'Framework Act on the Management of Disasters and Safety', targets vulnerable to disaster and safety recognize the specialty and discrimination within general disaster safety management, and in the sense that intensive individual management is necessary. The term is defined as 'disaster safety weak' incorporating disaster and safety accidents (Choi, 2016: 20-23). Accordingly, Framework Act on the Management of Disasters and Safety (2020) defines socially disadvantaged groups such as children, the elderly and the disabled as vulnerable to safety (§3, 9-3). However, the safety-vulnerable class defined in this Act focuses on the behavioral characteristics of the socially disadvantaged with these physical vulnerabilities or on improving their problems in the disaster response process, but lacks discussion of effectiveness (Choe, 2018: 7).

As a result, the socially disadvantaged as the disaster-safety vulnerable class includes objects with economic vulnerability, physical vulnerability, and cultural and environmental vulnerability, although there are differences in the use of several terms and inconsistency in the definition of concept. In other words, the socially disadvantaged group in broad sense is a broad relative concept up to the general citizen, but in terms of management, it is necessary to cover the elderly, children, the disabled, women, pregnant women and mothers, foreigners, and the low-income class and the next higher class as the economically poor class. And it is discussed as having the following common vulnerabilities in the event of a disaster (Lee, *et. al*., 2019: 18). First, the socially disadvantaged group is difficult to evacuate and initial response by magnetism from the physical aspect. Second, due to differences in environmental, cultural, or living conditions, they are vulnerable to disasters temporarily or in the long period. Third, it includes classes with economic vulnerabilities that are difficult to lay the foundation for a basic safe life. In particular, the differences between these socially disadvantaged groups do not have clear boundaries, but are characterized by exposure in a complex form that makes responding activities more difficult in the event of a disaster.

Thus, these Groups' disaster vulnerabilities can be defined as not having the ability to know (risk observation) if they are in danger, the ability to accept information about the risk (information acquisition, speech), the ability to take appropriate action against such risks (action capability), and the ability to sufficiently address the damage caused by the risk (economic ability) in overcoming the disaster situation.

Necessity of Evacuation System for the Socially Disadvantaged in Public Facilities

Among the social disasters that have occurred in the last 10 years, accidents related to the socially disadvantaged were a fire at the Indeok elderly care center in 2010 (10 deaths), a health crisis caused by group leave of doctors in 2014, and a fire accident at Jangseong Hyosarang Medical Center in 2014 (21 deaths, 8 people injured), and a fire in the Jecheon Sports Center in 2017 (29 killed and 40 injured). However, when considering statistics, etc., management of the socially disadvantaged as a policy target to identify clear problems with the policy targets is subordinated, and there is a limit to clearly reflecting this in policy due to the diversity of terms in socially disadvantaged. But according to BAI (2019), large-scale fires in public facilities such as nursing homes, small and medium-sized hospitals, day care centers, youth training facilities, and academy facilities are likely to cause large-scale damage to lives and property. Large facility fire accidents are the most frequent.

In addition, construction and firefighting such as illegal structural changes of buildings such as the closure of emergency exits or unauthorized extensions, design and construction of firefighting and electrical equipment that do not meet safety standards, and the unauthorized removal of disaster prevention facilities such as fire doors and sprinklers as factors causing large-scale fires in public facilities. As the poor safety of electric facilities is remarkable, attention is needed for the socially weak evacuation system for public facilities.

In particular, despite the widespread range of public facilities and efforts for comprehensive and systematic safety management in the disaster and safety management field, there is no concern about the gap in safety management due to the size and nature of the facilities appearing in the legal system and confusion due to differences in management systems. Considering the inevitable point, there is a high need for a research approach to understand the problems of the evacuation system for the socially disadvantaged in the event of a fire in a public facility.

However, the socially disadvantaged group deals with the difference in terms of relative vulnerability to the general population,

but there are differences in the sharing of space and a series of life activities (work, shopping, leisure, cultural life, etc.) in the process of their daily activities. It is worth considering that it is not. Therefore, it is very important to deal with policy measures for institutional arrangements for disaster evacuation and response in the event of a fire disaster in a public facilities as a living space occupied by the characteristics of social disasters, considering the high uncertainty of disaster occurrence.

Public Facilities Safety Management for Socially Disadvantaged in Korea

In the process of establishing the first basic fire safety policy plan (2017-2021) in Korea, the main issues pointed out as problems of major fire safety conditions are: ① generalization of fire risk and increase in vulnerability, ② structural limitations of accident response and response-oriented policies, ③ uniform fire safety standards, ④ government-led safety management activities and lack of infrastructure (infrastructure to prepare for future fire safety) were presented. In particular, as one of the factors of increasing fire risk and vulnerability, the increase in the number of vulnerable victims and the aging of buildings were suggested. Accordingly, with the aim of establishing a dense social safety net, the basic direction was to establish a strategy to increase fire safety for residential spaces and to reduce vulnerability to the vulnerable such as large fires.

Accordingly, measures to strengthen fire and evacuation safety measures at facilities for the vulnerable are being promoted as follows.

Target facilities are highly vulnerable from fire and require assistance when evacuating, and aims to strengthen comprehensive fire and evacuation safety for facilities for infants, the elderly and the disabled. In this case, the scope of the victims is those who need assistance in the event of a fire due to cognitive, visual/hearing, and activity disorders. The specific targets for each policy are as follows.

First, government are considering promoting measures to strengthen fire and evacuation safety at facilities for the vulnerable to disasters for infants and toddlers. In particular, postpartum care centers (63% of postpartum care centers are located in complex buildings) with relatively high fire response and evacuation vulnerability due to awareness and evacuation obstacles in the event of a fire. Korea are considering the following. For postpartum care centers and nursery facilities used by infants and mothers, the fire-causing factors of postpartum care centers are limited, the evaluation and certification system for infants and toddlers is improved, and the disclosure system is supplemented. Specifically, in the case of postpartum care centers, the entry of fire risk facilities (a merrymaking liquor store, etc.) in the building is restricted, and only if an evacuation space is provided, the permit system is applied to allow installation other than the evacuation floor (1st floor). In addition, the Ministry of Health and Welfare encouraged voluntary participation in daycare centers by improving the “daycare center evaluation and certification system,” and reinforced safety education and regular fire drills among the safety protection of infants and children (5 items).

Second, it is promoting measures to strengthen fire and evacuation safety measures for the elderly in facilities for the vulnerable. In Korea, while the ratio of the elderly population continues to increase, fire damage to facilities for the vulnerable such as welfare facilities and nursing hospitals is increasing rapidly. Accordingly, a systematic fire safety policy is being promoted by reinforcing firefighting facilities in nursing hospitals and nursing facilities and improving certification systems and preparing for fires. Specifically, nursing hospitals are improving the evaluation and certification system to induce early installation of sprinkler fire extinguishing facilities and reorganizing fees (granting incentives). On the other hand, nursing facilities prepare detailed standards such as fire evacuation, support the installation of fire safety windows (upper open/close type exhaust windows) to secure evacuation time, mandated staff to care for the elderly at night, and regularized full-time inspection (at least once a year) by fire departments.

Third, promoting measures to strengthen fire and evacuation safety measures at facilities for the disabled for the disabled. In general, it is considered that the disabled's ability to cope with fire is relatively weaker among the vulnerable. Accordingly, the establishment and utilization of evacuation safe spaces for the disabled, customized manuals for each type of disability, education and promotion are strengthened, and promotion of the installation and utilization of evacuation safe spaces at residential facilities for the disabled and medical rehabilitation facilities for the disabled is strengthened. In addition, every year, government are striving to subdivide the manuals for responding to fires in case of fire and improve the existing common manuals with customized education and publicity to subdivide them into persons with disabilities, rescue workers, and helpers.

On the other hand, the government has contributed to the installation, maintenance and improvement of safety management of multi-use facilities and safety facilities in the last 10 years. Considering the reality, the 3rd basic plan was established with a focus on reinforcing measures to protect lives and risks of multi-use businesses.

Among these, as a measure to strengthen fire safety management for the socially disadvantaged, we are promoting the development

and distribution of customized evacuation assistance devices, as well as improving the screening standards for evacuation guide videos for the disabled. Specifically, screening standards such as sign language and closed captions were established by improving the standards for the screening of evacuation guide videos for the disabled, and a new provision for imposing fines for violations. In addition, it is developing and distributing customized evacuation aids considering the evacuees, and conducting research on the disaster environment and evacuation characteristics of evacuees by industry through domestic and overseas status surveys, developing and distributing prototypes.

Analysis of Public Facilities Safety Management Policy Trends in USA

Safety Management under Building-related Laws

In the United States, the International Building Code 2015 (IBC), established by the International Commission on Regulations (ICC), sets standards for ensuring safety from risks related to the built environment. The IBC consists of a total of 35 chapters and 13 appendices. Among them, matters related to facility standards for building fire safety are Chapter 1 General Regulations, Chapter 2 Definitions, Chapter 3 Classification by Usage, Chapter 5 General Building Heights and Areas, Chapter 7 Fire and Smoke Disaster Prevention, Chapter 3 Includes Chapter 9 Fire Protection Systems, Chapter 10 Emergency Exits, and Chapter 11 Accessibility. In addition, IBC is divided according to usage, height and area of buildings, and the classification is as follows.

First, by usage, Assembly (assembly type), Business (office type), Education (education type), Factory (factory type), High-hazard (high risk type), Institutional (institutional type), Mercantile (commercial type), residential it is classified into 10 types: (residential type), storage (warehouse type), and utility (special purpose type). Second, depending on the height and area of the building, ancient limits of the maximum height and the maximum number of floors are set based on the height and number of floors of the building, respectively. It is decided according to the state.

On the other hand, matters related to fire safety are as follows.

First, the fire and smoke disaster prevention in Chapter 7 stipulates the combination of building materials, systems, such as separation between buildings, interior finishing materials, etc. to provide a safety device against the spread of fire and smoke caused by a fire. Second, in Chapter 9, Fire Disaster Prevention System specifies the areas where fire disaster prevention systems are needed, operation, supervision, automatic sprinkler system monitoring, fire alarm and detection system installation, and fire alarm drawings.

In addition, the rules for safe evacuation in case of fire are as follows.

First, in Chapter 10, the emergency exit system regulations, the number of emergency exits, the width of the evacuation route, the restriction of the structure change, the preparation of fire safety and escape plans, the height of the emergency exit, the requirements for solving the problem of protrusion on the traffic line, the width, the floor surface. When using an emergency exit, it is regulated to determine the maximum number of users, including the number of users and space on the emergency exit route, and post them. Second, Chapter 11 accessibility is a provision for facility design and construction that considers physically disabled, elderly, infants and children based on emergency exits. Individuals with disabilities design architecture that considers access and access, the route is defined, and the design of the access route through general traffic lines, and in the case of a single access route, design not to pass through other similar spaces such as kitchens, warehouses, toilets and walls. In addition, it stipulates that Anra safety obstacles and safety checkpoints are designed so as not to obstruct the necessary access routes or emergency exits.

Safety Management under Fire-related Laws

More specific matters on the fire safety management of buildings are based on the regulations and standards established by the National Fire Protection Association (NFPA). NFPA has developed and enacted more than 300 building-related regulations and standards in the United States, and its own regulatory committee, consisting of more than 6,000 voluntary participants, continuously reviews the verification and revision procedures for the regulations, and overall review and approval by the National Standards Institute. The normative justification is secured by confirming through.

Although interrelated with the International Building Act prepared by the ICC, NFPA has independently prepared various regulations and standards related to disaster prevention of buildings, and these codes are an important certification standard for building safety management.

Among all the regulations, the regulations related to fire safety and evacuation related to this study are NFPA 1; NFPA 25; NFPA 101; NFPA 101B; NFPA 230; NFPA 424; NFPA 550; NFPA 1616; NFPA 1983; and NFPA 5000. The safety-related contents of the NFPA's established regulations and standards are as follows.

First of all, the fire fighting regulations of NFPA 1 contain

a total of 75 detailed provisions as detailed regulations for securing safety in case of fire, and the main goal emphasizes the purpose of securing the safety of life from fires and explosions during use of buildings. In addition, the emergency exit should be located in a place where visibility is secured, and the route to reach it should be clearly indicated, and the lighting of the emergency exit, the fire alarm system for the user, or it emphasizes the provision of notices and escape facilities.

On the other hand, NFPA 101 (Life Safety Code), which is highly related to NFPA 1 and used as a basis for a strategy to minimize fire impact based on the characteristics of buildings and occupations, consists of 43 chapters on life safety in new and existing structures. NFPA101 separately stipulates new and existing buildings due to the characteristics of the composition of the provisions, and specifically includes detailed information for underground buildings and high-rise buildings.

In the case of the United States, the concept of multi-use facilities is not separately set within the two related laws above, but considering the category of multi-use businesses, multi-dense facilities, and specific fire-fighting targets in Korea, the closest building type is for assembly purposes (Assembly Occupancies), and based on this, it is necessary to first examine the details of fire safety management.

Assembly use means meetings, religious ceremonies, entertainment, dining, drinking, entertainment, waiting rooms such as airports and terminals, or other similar special entertainment purposes, where 50 or more persons can be accommodated. However, if the entire building is used for special entertainment purposes, all of the buildings are subject to the relevant laws and regulations, regardless of the number of occupants. These include training centers, assembly halls, auditoriums, bowling centers, club rooms, university lecture halls, conference rooms, courtrooms, ballrooms, drinking facilities, exhibition halls, gyms, libraries, morgues, cinemas, museums, terminals, religious venues, swimming pools, recreation rooms, restaurants, and these include skating rinks, special entertainment buildings, and theaters.

The purpose of the assembly is a place where there are crowds that will cause confusion in the event of a fire, and are usually open to the public. In addition, it is subject to strong regulations because it is used not only by voluntary use of facilities, but also by targets who are not trained or controlled for fire.

In NFPA101, restaurants and drinking places with less than 50 people are classified as commercial, and meeting places with less than 50 people used for incidental purposes are based on the main purpose. However, lodging facilities do not consider this use classification. Others are divided into educational (academy, kindergarten, school), nursing facilities, medical facilities, emergency facilities, correctional facilities, single or double-family houses, hotels, dormitories, multi-family houses, commercial facilities, business facilities, industrial facilities, warehouse facilities, etc.

Buildings subject to assembly use are premised on five major requirements related to safety in case of fire.

First, as a matter to determine the level of potential risk, it is divided into three-level risk groups and managed according to the characteristics of interior decoration, finishing materials, and handling materials of the building.

Second, as the requirements for the evacuation route, the capacity, quantity, arrangement, walking distance to the exit, the number of exits, the exit connected to the ground or outdoors, the illuminance and emergency lighting of the evacuation route, and evacuation indications (guide lights and guidance signs, etc.). The capacity of the evacuation route is standardized by setting the user load rate per person in consideration of the space characteristics (stuck, use of space, and surrounding structures) inside the assembly facility. The minimum width of the evacuation passage depends on the purpose of the building, as well as assembly facilities, educational facilities, hospitals, hospital emergency centers, residential facilities (hotels/apartments/communal houses), commercial facilities, and business facilities. However, NFPA1010 applies different minimum standards for the number of evacuation exits for existing and new buildings for hospitals and residential facilities.

Third, as the requirements for building fire safety, building structures and divisions, fire safety walls, smoke-proof walls and smoke-proof partition walls, vertical openings, special hazard protection, architectural interior materials, interior decoration and finishing standards are stipulated.

Fourth, as building-provided facilities and firefighting facilities, utilities, heating, ventilation, air conditioning facilities, ventilation facilities, fire handling facilities, elevators, fire detection, warning, communication systems, fire extinguishing facilities such as automatic sprinklers, inspections, and tests are prescribed.

Fifth, as a special requirement, set fire safety zones for at least 1 hour separated from other uses, protection according to automatic fire extinguishing facilities, limit the number of people per area, performance-oriented design, set evacuation components, protection of vertical openings, It stipulates protection plans from potential dangers, interior materials, standards for securing fire detection, alarm, and communication, standards for sprinkler installation, and exemption from fire extinguishing facilities such as corridors.

Evacuation Support System for Socially Disadvantaged Groups

In the case of the United States, the concept of social disadvantaged

is not used directly, but it can be understood as an individual or group with functional needs or limitations in terms of service accessibility.

In the Pandemic and All-Hazards Preparedness Reauthorization Act (2013), specifically, children, the elderly, and pregnant women, as well as the disabled, multicultural families, foreigners with significantly limited English proficiency, traffic weak, homeless, chronically ill, drug dependency, etc. It includes comprehensively. The evacuation support system for the socially underprivileged as these disaster and safety vulnerable groups can be examined largely through the American disaster safety management system and actual cases.

In the United States, discussions on evacuation support systems for the victims of disasters have not been developed in detail, but after the outbreak of Hurricane Katrina, it expanded.

First of all, the support system centered on the disabled is the establishment of an integrated disability coordination room under FEMA in 2010 to prepare for disasters, education and training, warning systems, and consideration of temporary shelters. In addition, through the All-Hazards Preparedness Reauthorization Act, established in 2013, a comprehensive concept of disaster risk groups and disaster safety vulnerable groups is presented, and opportunities and resources for disaster preparedness, response and recovery are more quickly and we are laying the groundwork to provide smoothly. In particular, during the 9/11 terrorist attacks in 2011, the disabled on the 27th and 87th floors of the three disabled people with wheelchairs died because they could not escape, while the disabled on the 68th floor were rescued by evacuation chairs, highlighting the need to develop an emergency plan for the socially disadvantaged in the building.

According to the building safety management regulations of the United States, the stepless gap and effective width of the evacuation exit are the result of reflecting the specificity of these socially weak people, and the fact that the evacuation plan should be planned based on the number of occupied buildings and the number of living people is also a result of this.

In addition, the maximum allowable distance of the evacuation route reflects not only the number of occupants of the building, but also the age, physical condition, walking speed, the shape and number of obstacles, the number of people in the room and space, and the distance from the door inside the room. It is interpreted as the result of considering the characteristics of the socially disadvantaged, not behavioral characteristics of the general public. In particular, the United States is designing evacuation zones and fire-protected spaces on the premise of horizontal movement, which reflects the nature of the physically weak people's difficulty in vertical evacuation.

Discussion

This study investigated the policy characteristics in the extension of the disaster management policy for the socially disadvantaged based on the characteristics of safety management in the US building safety management and fire fighting laws.

The characteristics of public facilities safety management in the United States are as follows. First, unlike Korea, safety management standards are applied to a wide range of facilities through the concept of 'Assembly Occupancies (fifty or more persons)', which takes into account the number of people to be accommodated rather than the intended use. In addition, in the case of facilities that use less than 50 people, safety management standards are applied according to the purpose of individual facilities, and safety management for public facilities is tightly carried out. Second, in order to strengthen the safety management of vulnerable groups, these groups are guaranteed through organizations and laws to reflect the evacuation plans and facility standards to solve the problems of evacuation they actually experience.

The process of reflecting the evacuation plan for the socially disadvantaged reflected in public facilities in the United States and the facility standards for securing refuge provides implications for the use and purpose-based management of the facilities. Based on this, discussion tasks to strengthen the evacuation support system for the socially disadvantaged in the event of a fire in a domestic public facility can be presented as follows.

Since the purpose of preparing an evacuation system in case of fire for the socially disadvantaged is to establish a tight safety net that considers the various disaster vulnerabilities of the socially underprivileged, rather than finding a consensus at the general level, a sufficient discussion process was prepared and should be sufficiently reflected the positions and problems of the socially disadvantaged group. In particular, a communication channel for the socially disadvantaged to participate in the policy design process should be established so that policies can be considered based on the support needs required during the evacuation process in the event of a fire in the public facilities. In addition, considering the increasingly increasing disaster safety threat factors, there is a limit to accessing the disaster vulnerability of the socially disadvantaged from the perspective of the general public in relatively normal response activities. Rather, the individual needs of the socially disadvantaged group should be identified and integrated so that a strict evacuation support system can be prepared.

And it is necessary to establish a disaster evacuation plan in consideration of the specificity of the residential facility space. The preparation of safety management plans and evacuation plans,

etc., is presented in an exemplary form and standardized scope of preparation, and for this reason, managers or workers of facilities who need to prepare plans are standardized without considering the specificity of the facility and the disaster vulnerability of facility users. There is a problem of preparing a common plan. Therefore, it is necessary for the subject of preparing the safety management plan or evacuation plan to prepare a plan that takes into account the fundamental characteristics of the socially disadvantaged of the facility or the structural characteristics of the building. That is, even in the case of physical disabilities such as audiovisual or physical disabilities, evacuation sites and areas must be set in consideration of securing evacuation time considering the difference in mobility during the evacuation process, and information message delivery methods for fire situations such as alarms, etc.

Finally, it is necessary to periodically check the safety management plan and the effectiveness of evacuation measures in the facility through scenario-based training involving socially disadvantaged groups. Through this, the government should analyze the vulnerability factors in the disaster response process and supplement the alternatives that take into account the measures needed by the socially disadvantaged in the event of a disaster.

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