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The Current Status and Tasks of Disaster Mitigation Education in South Korea

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Abstract

Recently the frequency of occurrence of natural disaster caused by global warming and ozone layer destruction has increased. South Korea is not an excluded area from natural disasters anymore and small and big sizes of disasters have broken out. However, government and public agencies have only focused on controlling the situation and restoring damages conditions and the disaster mitigation education to minimize damages is significantly insufficient.

This study aims to identify the current status and problems of disaster mitigation education and to find out the alternative plans for it. The literature research was employed as the study method based on previous studies related to disaster mitigation education. Currently disaster mitigation education in South Korea has been implemented for citizens, children and youth through school system, civil defense drills, safety learning centers and fire authorities. It was found that the problems of current disaster mitigation education have been caused by the implementation of superficial and theory-focused education and the lacks of contents, time and personnel for education. To solve those problems, alternative plans such as the education focusing on experience, the development of educational contents according to the subjects, and the expansion of specialized personnel and staff to carry out education need to be explored.

Key Word: Disaster Mitigation Education, Natural Disaster, Civil Defense, Safety Education

1. Introduction

Natural disasters such as flood, drought, heavy snow, typhoon, earthquake and tsunami caused by extreme weather events have broken out World widely, which means that we can confront disasters anywhere and anytime(Park Jin-Sun 2006).

In August, 2005, hurricane Katrina that hit

four states as well as New Orleans in Louisiana State produced about 10,000 casualties, covered 80% of cities with water and made millions of sufferers leave their home. In January, 2010, earthquakes that hit Haiti with magnitude 7.0 killed 0.23 million, produced 0.3 million casualties and gave damages of 7.8 billion dollars

Most recently in March 11, 2011, one of the biggest natural disasters broke out in north-

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east area in Japan with magnitude 9.0 and produced 10,000 casualties. Since there are many missing people, the casualties will increase more. Moreover, the tsunami caused by the earthquake swiped from Hokkaido in north area to Okinawa in the southernmost destructing ships, buildings, etc. along the beaches and made Fukushima nuclear power plant leak radiation, which has made casualties and property damages

Considering the geographical and meteorological conditions, South Korea is not the exception of natural disasters anymore and has experienced serious damages by flood, heavy snow, typhoon, etc.; among the natural disasters, flood have caused the biggest damages in South Korea, for example, heavy rain from July 11 to 16, 2009 produced 13 casualties and 29.88 billion won of property damages.

In addition, the frequencies of occurrence and observation of earthquakes have also rapidly increased in South Korea. For 17 years from 1978 when the earthquake with magnitude 5.0 at Honseong broke out to 1995, 311 times of earthquakes broke out; earthquakes for nine years from 1996 to 2005 had occurred 366 times, which is more than the frequency of occurrence of earthquake for 17 years from 1978 to 1005. Therefore, there is possibility that serious damages could be caused by earthquake in South Korea. Since earthquakes that have recently occurred in neighboring countries such as Japan and China could affect South Korea, the attention should be brought to earthquakes.

Whenever natural disasters have caused human and physical damages, South Korean used to blame the lack of ability of departments in charge of disasters and discuss the measures to deal with problems caused by disasters. However, considering the past damages of disasters deeply, it has found that some of the causes to give damages have been caused by the lack of mitigation education to minimize damages as well as by the false sense of security.

Even though the sense of security of members of society is indispensable to minimize the damages caused by disasters, because it cannot be raised within a day, it is significantly important to improve the awareness of disaster by implementing the systemic and practical education in the society at large.

However, currently the disaster mitigation education has been hardly implemented and there is no material for it. The safety education that has been implemented is only limited to safety in school.

Therefore, this study aims to identify the current status and problems of disaster mitigation education that has focused on natural disasters in South Korea and to find out the alternative plans for it.

2. The Theoretical Background of Disaster Mitigation Education

1) The Concept and Goals of Disaster Mitigation Education

To understand the concept of disaster mitigation education, that of disaster mitigation needs to be looked over in advance.

The dictionary meaning of disaster mitigation is to prevent disasters such as fire and flood damages in advance. National Institute for Disaster Prevention(2006) defines that disaster mitigation is the activities to establish the system to mitigate the disaster damages in the areas of residence and workplace before the breakout of disaster, to quickly respond for the damages just after the breakout of disaster, to operate shelters, to visit temporary housings to help sufferers and to restore damaged areas including the relief activities to reach distant places from where he or she lives or works"

Based on these definitions of disaster mitigation, the disaster mitigation education may be defined as the education to help people and

their resident areas safely secured by making people protect themselves from disasters as the part of safety education to secure the safety of citizens from various dangers(National Institute for Disaster Prevention 2006).

Disaster mitigation education aims to culture the basic ability to respond for disasters by learning the reasons of occurrence of natural disasters based on the local conditions to break out them and the understanding of disaster mitigation system(National Institute for Disaster Prevention 2006).

The followed goals of disaster mitigation education can be achieved by implementing it comprehensively and systemically(National Institute for Disaster Prevention 2006).

- Disaster mitigation education aims to secure citizens' own safety according to phases of disaster alert when disasters break out.
- Disaster mitigation education as the building of character to cherish life should include the contents that give useful information to secure the safety of other citizens, groups and areas according to phases of disaster alert, since it is a part of mind to cherish
- For disaster mitigation education, teaching materials related to regional characteristics should be utilized, disaster mitigation training within the region be carried out and the principles, history and regions of disaster occurrence and disaster mitigation system be taught to be understood.
- For the region that has undergone disasters, disaster mitigation education should be carried out to teach the citizens in the suffered region to understand the principles of disaster occurrence and the measures of disaster mitigation and to respond for risky circumstances quickly and correctly.

2) The Necessity of Disaster Mitigation Education

In 1995, the Great Hanshin-Awaji Earthquake that broke out in Japan became the turning point of the perspective to reconsider the existing countermeasures against disaster. At that time, the earthquake broke out in the early morning and therefore, just after its occurrence, the public functions of fire-fighting unit, policepersons and army were paralyzed. However, 27,000 out of total 35,000 residents were rescued by residents of neighboring regions before public agencies arrived at the site, which gave the lesson how important disaster mitigation ability of community is to save residents' life when disasters break out. This event has made more emphasis put on disaster mitigation education and let us know the countermeasures based on self-preparation and the collaborations with neighboring residents may be more effective as well as the help of public agencies.

According to the nationwide survey on the awareness of natural disasters by the Board of Audit and Inspection of Korea in December, 2002 for 1,000 people as the subjects - 500 people who got damaged and 500 people who didn't by the Typhoon Rusa in 2002, 57.8% of subjects answered that they don't know how to deal with situation when natural disasters break out. In addition, 18.8% of people who didn't get damaged and 11.4% of who got damaged answered positively for the question whether they have ever been given training or education for the prevention and countermeasures of disasters or not; 68.4% of respondents with the experience of training or education for the prevention and countermeasures of disasters answered that those experiences were useful to deal with the situations caused by disaster, which shows the effectiveness of training and education and simultaneously the necessity of expansion and strengthening of training or education for the

prevention and countermeasures of disasters(The Board of Audit and Inspection of Korea 2003).

Because the range of the power of administrative agencies is very limited in the early stage of breakout of great disasters, it is important for residents to have competence to deal with the situation caused by disasters. In other words, the limitedness of disaster mitigation activities of government leads all people to have the sense of responsibility for the effort to preventing disasters or to deal with the situations caused by disasters. Therefore, disaster mitigation education is significantly important to produce citizens who are aware of how to mitigate disasters and practice the countermeasures against them.

3. The Current Status of Disaster Mitigation Education in South Korea

1) The Current Status of Natural Disasters in South Korea

In South Korea, heavy rainfall and typhoons frequently occur during summer on meteorological, geographical and environmental grounds. Rainfall varies significantly from each season; rainfall from October to March, which is the dry season, occupies 15% of annual rainfall and from April to September, which is the rainy season, 85% of annual rainfall. Especially 60% of annual rainfall rains and typhoons that accompany heavy rainfall break out for three months from June to August, which bring about flood, and give serious damages to submerge or bury where people live.

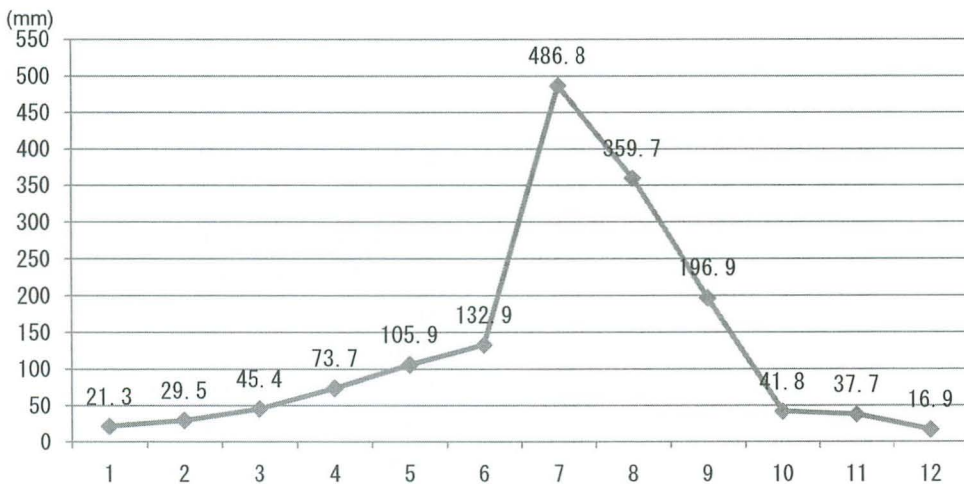


Figure 1 Average Monthly Rainfall in Seoul from 2001 to 2010

Source: Korea Meteorological Administration, 2011.

For the past 10 years, the property damages caused by natural disasters have accumulated to 20 trillion won. Among the types of natural disasters, typhoons and heavy rainfall have give about 17 trillion won of damage, which occupies over 80% of total amount of damage; by typhoon,

12 trillion won, 55% and by heavy rainfall, 5.3 trillion won, 25%. For the past 10 years, 719 persons were killed by natural disasters; among them, 661 persons by typhoons and heavy rainfall.

Table 1 Damage by Causes and Years for the Recent Ten Years from 2000 to 2009

(Unit: million won)

| Cause Year | Storm | Heavy Rain | Heavy snow | Heavy Rain and Storm | Snowstorm | Strong Wind | Wind and Waves | Total |
|---------------|------------|------------|------------|----------------------|-----------|-------------|----------------|------------|
| 2000 | 178,230 | 301,199 | - | 307,168 | - | - | - | 786,597 |
| 2001 | - | 562,739 | - | - | 974,886 | - | - | 1,537,625 |
| 2002 | 6,368,740 | 1,141,624 | - | - | - | - | - | 7,510,364 |
| 2003 | 5,086,490 | 210,084 | - | - | - | - | - | 5,296,574 |
| 2004 | 386,917 | 243,523 | 763,382 | - | - | - | - | 1,393,822 |
| 2005 | 153,600 | 390,411 | 609,941 | - | - | 10,318 | - | 1,164,270 |
| 2006 | 12,974 | 2,095,205 | 5,688 | - | - | 15,430 | 6,250 | 2,135,547 |
| 2007 | 174,392 | 47,148 | 8,067 | - | - | 7,458 | 35,913 | 272,978 |
| 2008 | 856,149 | 57,984 | 3,640 | - | - | 1,113 | - | 918,886 |
| 2009 | - | 254,904 | 12,778 | - | - | 7,035 | 24,089 | 298,806 |
| Total | 12,362,203 | 5,304,825 | 1,403,493 | 307,168 | 974,886 | 41,355 | 66,253 | 20,460,183 |

Source: National Emergency Management Agency, 2009 Yearbook of Disaster.

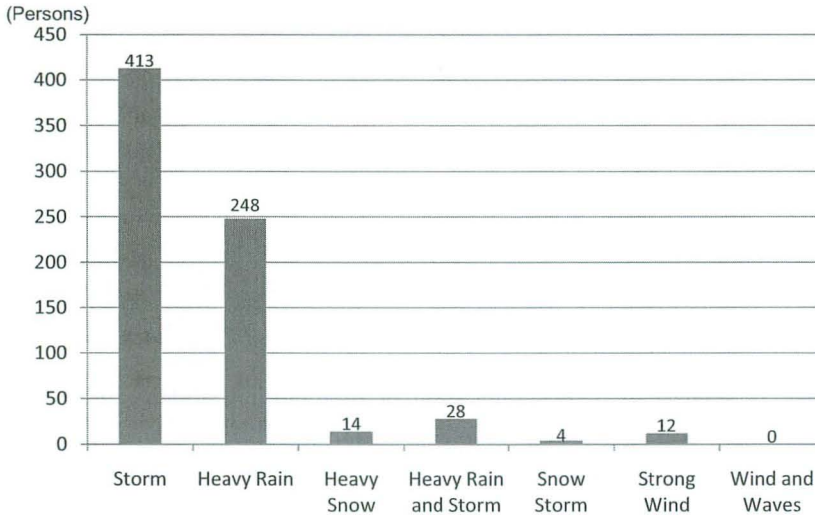


Figure 2 The Number of Deaths by Causes for the Recent Ten Years from 2000 to 2009

Source: National Emergency Management Agency, 2009 Yearbook of Disaster.

Based on the past 10-year data, the frequency of occurrence of earthquakes was 43.6 times and among them, the frequency of

earthquakes with over magnitude 3.0 was 8.5 times.

Table 2 The Frequency of Occurrence of Earthquake from 2000 to 2009

(Unit: time)

| | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | Total |
|--------------------|------|------|------|------|------|------|------|------|------|------|-------|
| Total | 29 | 43 | 49 | 38 | 42 | 37 | 50 | 42 | 46 | 60 | 43.6 |
| Over magnitude 3.0 | 8 | 7 | 11 | 9 | 6 | 15 | 7 | 2 | 10 | 10 | 8.5 |

Source: National Emergency Management Agency, 2010

Besides of the earthquakes that break out in South Korea, the South Korea has affected by the earthquakes that broken out in Japan, too. In May, 1983, tsunami caused by earthquake with magnitude 7.7 in Akita, Japan, killed 3 persons, injured 2 persons and gave 370 million won of damage including destroying 81 ships and 100 homes to the east coast of South Korea. The earthquake with magnitude 7.8 that broke out in Okusiri in July, 1993 destroyed 35 ships, 390 million won of damage to the east coast of Gangwon and Gyeongbuk provinces

2) The Current Status of Disaster Mitigation Education

In South Korea, National Disaster Management Institute has implemented disaster mitigation education for the public servants in charge of disaster mitigation in administrative agencies such as provinces, cities, and town and Civil Defense Corps members to deal with the situation caused by natural disasters from March to April, every year. The education has been carried out by using special lectures and audio-

visual materials.

Characteristically the educations for youth and children have been carried out through the formal school educations and those for citizens through the irregular and informal programs such as civil defense drills, reserve forces trainings and workplaces. In addition, Seoul Civil Safety Experience Center, which was established in 2003, has provided disaster mitigation education as the specialized center for safety.

① Disaster Mitigation Education for Children and Youth

The disaster mitigation education for children and youth has been carried out through formal school education, which has been practically considered as a part of safety education. Especially safety education has been carried out as the part of cross curricular subjects together with environment and energy education. Pertinent contents to safety are dealt with in 67 chapters of 36 subjects such as Korean, social study, technique, military training, housekeeping, physical education and life and science from elementary to high schools.

Table 3. Subjects related to Safety Education in Elementary, Middle and High Schools

| Level | Contents related to Safety (traffic safety) | Contents related to educations for Countermeasures against Disasters |
|----------------------------------|---|--|
| Elementary | 12 chapters in 8 subjects including science | 5 chapters in 4 subjects including science |
| Middle | 7 chapters in 3 subjects including technique and housekeeping | 4 chapters in 2 subjects including science |
| High | 25 chapters in 13 subjects including physical education | 14 chapters in 6 subjects including social study |
| Total 76 chapters in 36 chapters | | |

Source: Ministry of Education and Technology, Safety Education in the 7th Curriculum, 2005

In elementary schools, in the revision of the 7th Curriculum that has been gradually implemented since 2000, the contents related to deal with the situations caused by natural disasters were included to social study and

science and based on them, disaster mitigation education has been carried out; and safety education has been partially carried out based on the contents in the subjects such as moral education and guide of life.

National Emergency Management Agency (NEMA) added "Kids NEMA" section to NEMA website to help children learn how to deal with the situation of flood, earthquake, tsunami, heat and swimming since the winter vacation of 2006.

Ministry of Education, Science and Technology agreed with NEMA to utilize Kids NEMA for 4.2 million students of 6,179 elementary schools as the homework materials to learn how to deal with the situations related to disasters. The Kids NEMA section is divided into two types; one for the lower grades(1st to 3rd grade) and the other for the higher grades(4th to 6th grade). It is composed of 20 questions including multiple-choice and OX questions as well as illustration and animations that can intrigue the interests of children in safety.

In the middle school curriculum(Ministry of Education, Notification No. 1997-5), safety education was classified as one of

multidisciplinary learning including democratic civic education, personality, environment, energy, cultivating hard working spirit, health, safety, sex and consumer education. Therefore, safety education depends only on the decision of principal, because it is supposed to be implemented through discretionary activities, but principal can determine which subject would be chosen among those activities.

In the high schools just like in middle schools, there is not an independent subject dealing with safety education, but safety education is intensively dealt with in military training. However, since military training was classified as optional subjects like Chinese characters, cultural subjects according to the 7th Curriculum, in the school that does not select the subject of military training, safety education cannot be implemented at all(Park Jin-Sun 2006).

Table 4. Contents of Safety Education Included in High School Textbooks

| Grade | Subject | Chapter | Contents |
|------------|--------------------|-------------------------|--|
| All grades | Physical Education | Safe Living | Occurrence of safety accidents Prevention of accidents and disasters Exercise and Safety |
| All grades | Military Training | Accidents and Disasters | Traffic safety, fire safety, occupational safety, safeties against dangerous article, hazardous substances and natural disasters |
| All grades | Military Training | First Aid | Principle of first aid Types and methods of first aid Dressing method, Method of carrying patients |

Source: Korea Occupational Safety & Health Agency, Safety and Health Education for Middle and High School Teachers, 1999

The safety education for elementary students has been carried out by connecting with National Emergency Management Agency and intriguing the interests of students. However, the 7th Curriculum changed the safety education as optional, which made middle and high school students difficult to receive proper safety education. Even more serious situation is that the contents of safety education for middle and high

school students focus on man-made disasters such as traffic accidents, fire and industrial disaster, not on the disaster mitigation education for the prevention and countermeasures against natural disasters.

② Disaster Mitigation Education for Citizens

Currently the disaster mitigation and safety education for citizens have been implemented by

civil defense drills, military reserve training and safety education in workplace in South Korea. The leaders of civil defense corps and tongs and ris(the second and third lowest administrative unit) can take the civil defense and disaster mitigation education for citizens that are provided by National Disaster Management Institution of National Emergency Management Agency (NEMA). However, they are giving negative impressions to citizens, for the current educations are just one-offs and not practical,

It was found that the disaster mitigation education that does not consider the characteristics of education subjects like the level of knowledge has lowered the willingness of participants. Therefore, the systemic disaster mitigation programs for citizens should be planned and implemented in order to solve the problems of current disaster mitigation education, to heighten the level of knowledge of disaster mitigation and to raise the competent citizens for disasters.

It is desirable to establish community-based education system to strengthen capability to mitigate disasters including civic groups working for safety movement, flood prevention teams and volunteer fire corps and to operate the disaster mitigation education centers that are connected with private fire stations for practical disaster mitigation education(Kim Seong-Jeh 2006).

Civil defense drill is defined as self-defense activities such as air defense drill, urgent activities of disaster mitigation, rescue and restoration, and supports for military operation that must be carried out by citizens under the guidance of government in order to protect the life and property of citizens from enemy invasions or disasters(situation of civil defense) that endanger the safety and order of nation or some regions. Civil defense evacuation drill and disaster mitigation drill for civil defense corps have been implemented pursuant to Framework Act on Civil Defense, Article 21.3. Civil defense

drill has specified 4-year curriculum including practices and field studies by using safety training centers with the contents related to the preparation for disasters and the living safety such as how to cope with the situation caused by flood, how to secure the safety of traffic and how to prevent fire and to fight a fire.

Disaster mitigation drills are carried out six times a year in March, May, June, July, September and November; in March, drills to cope with forest fire and safety accidents during the spring thaw; in May and June, drills to cope with damages caused by flood(evacuation drill by issuing the disaster alert and training in the levels of city, gun and gu); in July and September, drills to evacuate from terrors and earthquakes; and in November, drills to cope with common safety accidents including fire and forest fires.

It has been pointed out that the effectiveness of current civil defense drill has been limited by large group education that does not reflect the occupational and functional characteristics of corps members and that the lack of educational devices and equipments has made field studies to cope with the situations caused by disasters limited. Especially field studies to provide civil defense corps with direct experiences by participating in civil defense drills, confirming vulnerable areas for disasters and shelters and visiting facilities related to safety, for example safety training centers, need to be expanded for the effective education for civil defense corps(Kim Seong-Jeh 2006).

③ Operation of Safety Training Centers and Theme Parks

Pursuant to Framework Act on Fire Services, Article 5, four safety training centers are operated: Seoul Civil Safety Experience Center, The Second Seoul Civil Safety Experience Center, Daegu Safety Theme Park and Taebaek Safety Experience Theme Park.

Citizens can get safety educations under the virtual situation of fire, earthquake, flood, etc. in Seoul Civil Safety Experience Center that opened in 2003 for the first time in South Korea. It is a public agency to gather the facilities into one building to provide all the citizens from lower grade students and youth to adults with experiences related to disasters(Kim Seong-Jeh 2008).

As shown on Table 5, Seoul Civil Safety Experience Center is the facility to help citizens directly experiences 20 kinds of disasters including fire, gas explosion, flood and earthquake under the virtual situation, establish environment to make safety a way of life, improve the coping ability for disasters and recognize the danger of accidents.

Table 5. Facilities of Seoul Citizen Safety Training Center

| Facility | Major functions |
|--------------------------------|---|
| Earthquake Simulation Room | <ul style="list-style-type: none"> Experiencing earthquake with from magnitude 0 to 7 by using Hydraulic actuating simulator Practicing how to deal with the situation in home-kitchen when earthquake breaks out |
| Relief and Rescue | <ul style="list-style-type: none"> Giving audience information on how to evacuate by having them use evacuation devices such as descending life line, safety ladder and rope |
| Smoke Escape Training Room | <ul style="list-style-type: none"> Learning how to escape from fire incidents based on the knowledge of the flow of smoke and the path of evacuation by reproducing structures on fire |
| Rescue of Mountain | <ul style="list-style-type: none"> Experiencing rescue of mountain by utilizing climbing wall that is located outside of center |
| 3D Video System | <ul style="list-style-type: none"> Experiencing the fear caused by disasters and damages caused by disaster while getting on small size of rider and utilizing 3D video system |
| Examples of Disasters in Seoul | <ul style="list-style-type: none"> Having audience watch the past disasters in Seoul by using miracle glass, arousing audience's attention and therefore preventing reoccurrence of past disasters |
| Safe House | <ul style="list-style-type: none"> Having audience experience safe house and unsafe house by using Magic Vision on the background of regular house |
| Damage from Storm and Flood | <ul style="list-style-type: none"> Providing experiences to go through the damages from storm and flood that accompany rain at a speed of 50m/s by using large blower and spring cooler. |
| Training for Professionals | <ul style="list-style-type: none"> Having audience practice to operate fire fighting equipments by using real equipments in the real model of building |
| First Aid(CPR) Training Room | <ul style="list-style-type: none"> Practicing CPR by using mannequins |

Source: Seoul Citizen Safety Training Center 2003

Seoul Fire Department reported that 13,510 citizens a month, 517 citizens a day visited the Center in 2007. However, there are potential problems in the aspect of quality of education that might be caused by the lack of personnel to run the Seoul Civil Safety Experience Center; 15 fire officers are working, which means that one

officer is charged with 40~50 visitors.

4. Conclusion

Disaster mitigation education is indispensably necessary to protect ourselves from disasters, for we cannot avoid disasters while we live and the

disaster management system focuses on controlling disaster and restoring damages.

curriculum depends on the decision of principal for middle school students and became optional for high school students. Even though disaster mitigation education for children and youth has been implemented more regularly than that for adults, it has largely focused on theoretical education rather than field studies and therefore, might not be effective and efficient for actual situations.

Disaster mitigation education for adults has not been carried out irregularly and has been one-off and not practical only focusing on participants. In addition, there are not sufficient diverse programs for disaster mitigation education to consider the characteristics of the subjects, which has lowered the willingness to participate in education and the effectiveness of education. Just like the situations of children and youth, as the disaster mitigation education for adults has been implemented through passive ways, for example watching videos, rather than field studies to give direct experiences for disasters, it might not be effective and efficient for actual situations, too.

Since the opening of Seoul Citizen Safety Training Center opened in 2003, 757,070 people had visited by 2007. Even though the visitors have gradually increased year by year, the personnel to run the Center are insufficient; 15 fire officers(2007) are working, which means that one officer is charged with 40~50 visitors and therefore may cause to lower the quality of education. The contents of the education do not reflect the characteristics of the subjects, which has lowered the willingness of participants and the effectiveness of education.

To solve those problems mentioned above, it is important to secure the provisions of extensive disaster mitigation and safety education, to provide the educations that focus on field studies to enable to directly experience the

situation caused by disasters rather than theoretical educations and to induce to participate in the educations by developing diverse contents and ways for them. Especially the disaster mitigation education in formal school education needs to be strengthened, for the education for youth is very effective and greatly affects the culture and competence of disaster mitigation. Government and public agencies should proactively attempt to solve the problems and initiate citizens into problem-solving efforts. Individuals should also recognize the danger of disasters and actively participate in the disaster mitigation education.

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