기본연구보고서 2019-9

자연재해·재난 대응을 위한 탄력적 도시설계 연구

A Research of the Resilient Urban Design for Natural Disasters by Climate Change

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SUMMARY

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Heatwaves and heavy rains that occur in summer are reaching disaster levels. The average heat wave has been 10.1 days since 1973 when the record of heat waves began, but 2018 had the highest heat wave of 31.5 days and 0.4 days longer than the 31.1 day of 1994, known as the worst heat wave ever. In particular, the heat wave in 2018 was shorter and rainier than other years, so the heat wave started early and lasted longer. Due to climate change, summer precipitation patterns are gradually changing. Since 2000, the concentration of summer precipitation during the rainy season has spread throughout the summer months, resulting in meteorological abnormalities such as guerrilla heavy rains, which cannot accurately predict the precipitation time. In recent years, as the intensity of heavy rains has increased due to climate change, concerns about urban flooding have increased in large urban areas such as Seoul.

The fundamental purpose of the development, maintenance and renewal of the city is to secure and improve the living conditions necessary for future life. In other words, the basic tense of urban policy is the future. However, Korea's cities are being created based

on market logic, with insufficient consideration for the future environmental problems. It is proposed to actively introduce climate scenarios, which are the representative future uncertainties, to the urban design process, which are commonly used by the internationally agreed standards of the UN IPCC, and to diagnose future vulnerabilities of cities at the present time as a basis for urban design. I would like to develop and propose an existing system.

Climate change impacts are diverse, but natural disasters have a direct impact on human life and property. In particular, as mentioned in the introduction, the phenomenon of flooding caused by heatwaves and heavy rains, which are the major summer phenomena in Korea, is considered as a natural disaster to be observed in this study. When heat waves and heavy rains affect our city in the future, we will establish resilience enhancement factors that can be improved from the present, and suggest a visual urban design guideline that should be shaped based on the current state of the city.

This study aims at diagnosing the vulnerability of urban areas due to heat waves and heavy rains assuming a future that is difficult to predict due to the summer effects of climate change. As a precautionary measure on vulnerability, the Paris Convention and the international community agree in common and follow the vulnerability analysis function formulated by the IPCC. Exposure, sensitivity and adaptability are defined as variables describing vulnerability, and each relationship is classified into factors that increase and mitigate vulnerability, and exposure and sensitivity are positive factors and vulnerability to adaptability is increased. It is defined as a negative relationship as a factor.

This study area is 'Daejeon-Sejong-Cheongju' area. Most of the previous studies have been concentrated in Seoul and the metropolitan area or have been conducted mainly in large cities such as Busan. This region is a region with a large change in urban development in the central region with a population of more than 2.6 million, and it is contained within the urban power zone because it is bound within the 20-30 km zone by the center. However, there are no cases of climate change-related studies that have selected this area as a research area by combining it into a wide-area living area.

By applying the effects of heat waves and floods at the same time on 2030, 2040, and 2050 for buildings and population characteristics, 'hazardous spots for both heat waves and floods', 'hazardous spots for floods', and 'hazardous spots for floods' In addition,

four types of 'safe spots for both heat waves and floods' can be used to derive the vulnerability analysis results every 100m × 100m unit space. As it examines future risks, it is defined as the result of vulnerability analysis to consider the elasticity of the sum of 2030 exposure value, 2040 exposure value, and 2050 exposure value in the unit space that is found to have high vulnerability.

In the same basic database, the vulnerability of heat waves and floods is calculated in parallel in the same basic database and the vulnerability scores of the heat waves and floods in the unit space (100m × 100m grid) are compared. do. Pair contrast bridges use LISA (Local Indicators of Spatial Association) analysis to identify group clusters. At this time, Bivariate Moran ’s I was used.

The urban design policy in Korea operates based on the permit and permission. As a check-up body related to urban development, licensees and permit holders may establish urban planning committees, landscape committees, building committees, etc. and operate them according to their respective laws. The Commission may have jurisdiction and implement coordination based on laws and guidelines to prevent overdevelopment of market logic. Since the committees have a structure to adjust the scope and physical form of development in accordance with the law and guidelines and fail to accept it, the committee does not have the final decision of license holders. Have

Poor location can lead to the problem that a city's natural disaster vulnerabilities are aggravated in almost irreversible form. If a facility decides on a location before a full review of the negative environmental impacts is made, it is difficult to apply fundamental prevention or resilience measures. The problem of incorrect location selection is that there is a good chance that it can happen even if there is a relevant system, and the future climate impacts are not properly reviewed. Therefore, in order to systematically establish resilience through urban design, a framework for each spatial hierarchy using vulnerability diagnosis should be considered.

The heat wave and flooding problem due to climate change is expected to become more serious in the future, and in the process of judging the location adequacy of facilities in the city through environmental assessment, strategic impact assessment and environmental impact assessment, the degree of vulnerability and degree of vulnerability will be Further review of alternatives that can be minimized should also be mandatory at the baseline stage. It should also improve the ambiguity about disaster prevention that

underlies the plan of action. This requires consideration of in-depth improvements in the district unit planning guidelines, which are the criteria for urban design policy.

Through vulnerability diagnosis, indicators to increase resilience according to the size of space can be set differently according to the characteristics of new and established development zones, and the system can be designed to apply technical matters through design. In other words, the first step to apply the concept of resilience to urban design is to have a frame and reflect it in a policy that can be used in a policy. If this is used by the relevant deliberation committee as the basis for the urban design approval process, it is expected that the concept and perception of flexible urban design will spread to society. In order to promote such a process, this study proposes an improvement plan of the district unit planning guidelines to the policy targets and directions.

Keywords :
Climate Change, Vulnerability Diagnosis, Composite Disaster, Heat Wave, Flood, District plan, Building plan