A GEOGRAPHICAL STUDY OF WINTER DISASTER EVACUATION ON A SEASIDE CITY WITH GIS AND GEO-MICRO DATA

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[SYNOPSIS]

The purpose of this study was to clarify the relationship between the transformation of urban structure and the vulnerability to disaster. Therefore, it analyzed a winter evacuation using geo-micro data and GIS. In addition, the disaster example is tsunami, and the study observed the environmental gaps between snow coverage term and non-snow coverage term.

The result was as follows. In Chapter 2, the study presumed the population in the tsunami-assumption-area of the Hokkaido Pacific coast. Then, the study chose Kushiro as the research area, because this city had the maximum population in the tsunami-assumption-area among the seaside municipalities in Hokkaido.

In Chapter 3, this research analyzed the building location in the tsunami-assumption-area in Kushiro using the city planning basic data. According to the analyses of refuge area by '*Network Volonoi Diagram*', it became clear that many residences built and increased in the tsunami-assumption-area in Kushiro.

In Chapter 4, this research created refuge-attainment-area using '*Network Buffer*', and analyzed the population characteristics by the census zone data. As a result, when tsunami had occurred, it was thought that the persons beyond capacity gathered in most evacuation areas in Kushiro. Moreover, it turned out that large population was in the evacuation difficult area out of the range in the refuge-attainment-area, and many elderly people lived there.

In Chapter 5, it reproduced quasi movement of evacuation routes, and recorded the GPS logs. This analysis showed that the elements which move late in snow coverage term were narrow passage, steep stairs and hill, a place for the removed snow, and thick ice on road surface.

As a conclusion, this study clarified the relationship between the transformation of urban structure and the vulnerability of disaster. Moreover, in order to prove it, the study developed the analysis method of the geo-micro data.