The Study on an Extraction of Flood risk factors applied to IFRM (Integrated Flood Risk Management) in Yangsan watershed, S.Korea

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1.INRTODUCTION

Korea natural disasters are characterized by floods in rainy seasons. For instance, in 2002, Typhoon Rusa swept through the eastern and southern parts of South Korea and did serious damage over a large area(Kwater, 2005). This experience gave us valuable knowledge to mitigate future flood hazards. Governments and civilians demand readjustment of the embankment and river control information in basin(NRFCO, 2005). A risk approach urges us also to consider whether people, property and other assets should be managed or even controlled, instead of only the flood. The flood risk management defines that one should not manage only the flood, but also the associated risk (i.e. the flood hazard and the vulnerability of the flood-prone area-as constituted by people, their property and their activities-equally) (FRANS, 2008).

2.OBJECTIVE

Integrated Flood Risk Management aims to maximize the efficient use of flood plains while minimizing the loss of life from flooding. In this paper we developed a GIS/RS-based FVI(flood vulnerability index) and mapping approach. The objective of this study is to produce Flood Control Micro Landform Classification Map from the FVI and extract flood risk factors.

3.FLOOD RISK FACTORS

3.1 Study Area

We determinate the location of the riskiest area among the 23 confluence points in Nakdong basin and approach using the field data(Yangsan stream). Yangsan watershed is surrounded by mountain ranges. Its length is 32.3km and its area is 24,322km^2. It is located between north latitude 128deg 51min to 129deg 14min and east longitude 35deg 15min to 37deg 37min.

3.2 Risk Factors

By providing rich natural resources, flood plains have attracted civilian. However, society is becoming increasingly vulnerable to the adverse impacts that flood events can cause. A methodology has been developed for assessing flood risk arising from fluvial plain, lowland and backmarsh. The authors suggest a methodology based on IFRM, integrate land and water management, using the flooding data, GIS data and Landsat images in 1980, 2002. The method has been applied to the Yangsan watershed, where outputs include spatial maps of flood risk map, landuse change. The authors also suggest a methodology for mitigating floods using FVI(flood vulnerability index).

$$FVI=[\ln(Fa/\tan A)/REM] \quad (1)$$

This study extracts flood risk factors such as flow accumulation in watershed[Fa], the local slope angle[A], Relative Digital Elevation Model[REM]. The authors produced the layers of a thematic map, which is a raw data acquisition from geomorphology, topography, satellite image. Finally, the authors produce Flood Control Micro-Landform Classification Map.

4.CONCLUSION

In this study, residents of flood plains are responding to their flood risk circumstances produced Flood Control Micro-Landform Classification Map from the FVI. We conclude that the flood-prone areas can be extracted by applying spatial analysis on GIS such as urbanization, agricultural practices and deforestation. Flood risk factors have been used to support decisions relating to strategic flood risk management. Ultimately this can lead to estimates of the true risk and justify mitigation measures.