An Analysis of Flood Vulnerability by Administrative Region through Big Data Analysis

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(a) Purpose of study or research hypothesis

As climate change continues around the world, intensity and frequency of natural disasters are increasing. Among various natural disasters, hydrological disaster caused by torrential rains and typhoons accounts most. This study aims to identify flood damage phoenomena frequency based on internet-based investigation. Flood damage tends to vary in scale and extent according to regional and hydrological characteristics. This is due to differences in degree of exposure such as regional characteristics and population distribution. For example, even in same rainfall intensity, which causes flood of same magnitude, if population or physical infrastructures are concentrated in regions with low altitude, extent of probable damage is high compared to high altitude mountainous area where population and physical infrastructures are less. In order to manage these heterogeneous damages, collection of large amount of data is necessary and analysis of this data helps in flood preparedness in advance and hence, supports for planning of various countermeasures.

(b) Key issue(s) or problem(s) addressed

-Identifying flood damage phenomena based on the scale of flood damage in the past through big data analysis.
-Evaluating the vulnerability of flooding in administrative districts through comparative evaluation of probability rainfall based on the frequency analysis of rainfall.

(c) Methodology or approach used

The flood damage phenomenon was collected using media information such as news articles and reports. The collected unstructured form of text data was numericalized by extracting stereotyped keywords such as flood damage phenomenon using 'Text Mining' techniques of Big data analysis in Python.
Further, to analyze regional characteristics, we evaluated flood vulnerability by administrative districts. For this, a comparative evaluation of probability rainfall was done through frequency analysis of rainfall.

(d) Results or conclusions derived from the project

Flood damage phenomenon was investigated using news articles or media information, and frequency of flood damage phenomenon was different depending on regional characteristic of administrative districts. Urbanization caused a lot of "building flooding" and "life damage" in urban areas where populations and assets were concentrated, and relatively less urbanized areas had fewer flood damage, and coastal areas had "fishing damage" unlike inland areas.

(e) Implications of the project relevant to congress themes

Worldwide, flood damage is increasing every year and causing massive casualties as well as property damage. The application of Big data Analysis eases flood damage assessment and helps for planning measures for flood vulnerability protections. Such assessments strengthens administrative capability enabling concerned stakeholders to plan for timely preparedness hence improve resilience of community to flood damage.

Keywords : Flood Vulnerability, Big Data, Text Mining