Analysis of Eco-DRR and Ecological Services using InVEST at the Disaster Areas of Kumamoto Earthquake

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When compared with other countries in a global point of view, Japan is a country with high number of natural calamities, significant causalities, economic loss and damages by earthquakes, typhoons, and eruption. The damage is especially big when a hazard comes right after another one.

Complex disaster refers to the occurrence of multiple disasters instead of one. Such as, in 2016, Kumamoto prefecture was hit by earthquakes with magnitude as large as 7 and within another 2 months, by heavy rain and the damage was tremendous.

There is a huge number of researches on the eco-application of proceeding in various countries and it is vitally important to verify their validity. Here, InVEST refers to the ArcGIS tool for the integrated review for ecological services and its compensation.

This research focuses on the analysis of the changes of the land cover as reflected in satellite pictures of the whole Kumamoto prefecture taken after the complex disaster, the earthquake in April 2016 and heavy rain in June 2016. Also, it's a review on the ecological services with the use of InVEST. A special focus is paid on the review of the soil retention and the quality changes of the eco-habitant as reflection of the disaster damage reduction measures.

In addition, there is an analysis on the change of land coverage on area-unit level with Mashiki-machi, the epicenter, as the target. Furthermore, projection was plotted for the ecological services implemented as the reconstruction plan.

Keywords: Kumamoto Earthquake, Eco-DRR, Ecological services, Complex Disasters, local governments/local communities, InVEST