A Research about the role of Eco-DRR: Ecosystem-based Disaster Risk Reduction in landscape design in Asian Cities

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Introduction

When compared with other countries in a global point of view, Asia is a large area and the climate is diverse. In recent years, extreme natural phenomena affected by global warming have caused major natural disasters are frequent. 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. There are some signs of adopting the Eco DRR concept in Asia. The scope and methods are limited, such as replacement and rainwater infiltration technology. Above all, the delay in research on planning and design is remarkable. Under these circumstances, landscapes are expected to be designed for gardens, parks, green spaces, etc. for simple beauty.

This research focuses on the analysis of the changes of the land cover on area-unit level with Mashiki-machi, the epicenter, as the target. By this research, the current disaster histories, disaster prevention policies, and urban plans of major Asian cities will be organized, analyzed, and evaluated. In addition, Asian economies expanding from the perspective of Eco DRR a new landscape design of the city will be presented, and it will show how a city coexists with frequent natural disasters.

Methods

In this study, to summarize the natural disasters and damage situation in Asian countries, and to identify the major cities most frequently affected in particular, organize the disaster prevention policies and city plans of each city and clarify the relationship with the disaster situation.Main research regarding the research method used in the above, evaluation of ecosystem services uses InVEST. Data will be collected using satellite data and UAV and organized as GIS data.

Results

After the earthquake, Mashiki town suffered 3278 completely destroyed houses and 926 partially destroyed houses. Residential areas in the reconstruction plan have increased the area of buildings in the city. Due to land cover change, collapsed residential land became a waste land among the building lands that caused environmental degradation in Mashiki town after the earthquake, and their environmental degradation sensitivity became more sensitive. The distribution of environmentally degraded areas in Mashiki Town after heavy rains remained the same mainly around urban building sites and road sites, and rice fields along the river changed to rough lands, but their sensitivity to environmental deterioration almost changed. The distribution of the environmentally degraded areas after the reconstruction project in Mashiki-cho the environmentally degraded area around the urban building site became wider. However, it was found that the high area became large. From the viewpoint of Eco-DRR, the change in

habitat quality was found to be large along the river because the habitat quality of some of the rice fields along the river was high. From the perspective of ecosystem disaster prevention, in the event of a heavy rain disaster after an earthquake, it is expected that designating green areas along the river, rice fields, and other agricultural lands as disaster prevention areas will have the effect of reducing disasters. In the Mashiki Reconstruction Plan, residential areas that contribute to reconstruction in response to the earthquake disaster have been set up, but the surrounding fields and other agricultural lands have been converted to building lands, and the surrounding habitat quality has deteriorated. From the perspective of ecosystem disaster prevention, it is desirable to formulate a reconstruction plan that does not cause a reduction in habitat quality in Mashiki town.

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