

Effect of Rain Garden on Ecological Network Improvement and Inland Flood Reduction

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1. Introduction: Rain Garden that contributes to Urban Biodiversity and adaptation to Climate Change

Attention for Urban Biodiversity is increasing because ecosystem services from urban nature can play an important role to improve living environment or to help disaster reduction such as inland flooding which is increasing¹⁾. This research deals with Rain Garden that not only contributes to urban biodiversity but also help environmentally friendly rain water management. Rain garden is the shallow depression with native plants to gather and retain rain water from impervious area²⁾. It prevents rain water from running into the drainage by holding it and reduce the risk of flooding. It also helps to improve local biodiversity by its plants. Rain garden is a popular effort in United States or European countries. However, there is no rain garden in Japan. Therefore, the simulation has been done at Moriguchi city, Osaka in order to verify the effect and installation potential.

2. The Effect of Rain Garden : Simulation of Effect of Rain Garden

Study area is between Yodo River and Tsurumi Green Park. First, extract permeable area. Second, search the site to be able to apply the rain garden. Third, compare the ecological network situation between before and after the application of rain garden by *Papilio Xuthus*. Finally, evaluate the effect of reducing runoff by measuring infiltration capacity.

2. The Effect of Rain Garden

The area of isolated area to *Papilio Xuthus* has become less than half by converting 2% of whole area like roadside and parking side into rain garden. In terms of reducing risk of inland flood, rain garden play subsidiary role to disastrous downpour by itself, so it is essential to apply all kinds of other method. Meanwhile, when we don't think disaster reduction but daily rain water management, rain garden can help rain water to be able to go back into the soil. The simulation revealed that rain garden can deal with comparatively soft and short time downpour like 10 mm/hour such as evening shower in summer. Taking all results into consideration, rain garden can be of help to carry forward the effort that makes Japanese city more nature harmonious place by managing rain water with caring ecosystem.

3. Citation

- 1) 内水ハザードマップ作成の手引き (案) . 2008. 国土交通省都市・地域整備局下水道部
- 2) Across Maryland. http://www.co.worcester.md.us/drp/natres/Rain_Gardens_Across_D.pdf