

# Spatial Prioritization of Permeable Pavement Considering Multiple General Circulation Models: Mokgamcheon Watershed

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## (a) Purpose of study or research hypothesis

This study used Stormwater Management Model to analyze the water quantity and quality of the Mokgamcheon which had been severely urbanized, considering future climate scenarios presented by various general circulation models (GCMs).

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

Rapid urbanization increases the risk of hydrologic disasters due to the increase of impervious areas in urban areas. Precipitation characteristics can be transformed due to the rise of global temperatures. Thus urban areas with the increased impervious areas are more exposed to hydrological disasters than ever before. Therefore, low impact development practices have been widely installed to rehabilitate the distorted hydrologic cycle in the urban area.

## (c) Methodology or approach used

This study used Stormwater Management Model to analyze the water quantity and quality of the Mokgamcheon which had been severely urbanized, considering future climate scenarios presented by various general circulation models (GCMs). In addition the effectiveness of permeable pavement by 27 sub-watersheds was simulated in terms of water quantity and quality considering various GCMs and then the priorities of sub-watersheds were derived using alternative valuation index which uses the pressure-state-response framework.

## (d) Results or conclusions derived from the project

As a result of priority selection of quantity, scenario 1 was selected in order of D7, D12, D11, and D1, and scenario 2 was selected in order of D7, D12, D1, D11, and D10. In scenario 3, D1, D7, D19, D10, and D18 were selected in order. In the scenario 1, D27, D2, D6, D3, and D4 were selected in order, and in scenario 2, D27, D6, D2, D3, and D4 were selected. D15 and D1 were selected in this order. In order to prioritize quantity, the maximum value of each scenario of AEI decreases when weight is gradually increased, and the difference between maximum value and minimum value gradually decreases.

## (e) Implications of the project relevant to congress themes

When we add and analyze the factors that correspond to the PSR model, it is expected that accurate results of the study will be derived. In addition, it is expected to have a positive effect on the stable water circulation during the urbanization period, which is expected to reduce abnormal rainfall and climate uncertainty caused by global temperature rise.

**Keywords** : Permeable Pavement, General Circulation Model, Low Impact Development, Alternative Evaluation Index