Optimization of Low Impact Development Based on SWMM and Genetic Algorithm: Case Study in Tianjin, China

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Low impact development (LID) is an important measure to control the total amount of rainwater runoff from the source and solve the problem of non-point source pollution. However, there are many kinds of LID facilities, and the selection and layout of these facilities are restricted by the local physical and geographical conditions, hydrogeological characteristics, water resources, rainfall patterns and other factors. Therefore, the selection of LID facilities and the determination of optimization scheme are the main challenges for the construction of LID rainwater system. In this study, SWMM model and genetic algorithm (GA) are used to optimize the layout of LID. The multiple objectives include runoff reduction, occupied area and lifecycle cost. The results show that the combined LID facility scheme has obvious control effect on runoff reduction in the 10-year rainfall process.