

Urban Flooding in Ljungby Municipality and the Effectiveness of Blue-green Mitigation Measures Using the Software SCALGO Live

Popular science summary:

One of the realized consequences of climate change is a shift in precipitation patterns and an increase in extreme rainfall events. In addition, the growing urbanization trend associated with population and wealth growth has led to an increase in impervious surfaces while reducing groundwater recharge. In Sweden, it is expected that by the end of this century, annual precipitation will continue to increase, thereby increasing the possibility of urban flooding risks.

Ljungby city suffered a heavy rain on August 10, 2020. The rain event was about 70 mm in one hour. The event was estimated to have a return period equivalent of about 120-140 years, which caused many floods in the basements of private houses and public places.

This is an important investigation, but it will be more interesting to look at measures to ensure that similar floods do not occur again. Due to climate change, heavy rain will become more common. The area's most severely affected by floods can be delineated. Environmental measures to prevent similar floods from happening again can be proposed. In the future, how will Ljungby City adapt certain areas of the city to avoid similar flooding?

The main purpose of this thesis is to provide decision support for the implementation of Ljungby climate change adaptation strategy to reduce the risk of urban flooding caused by extreme rainfall events in the study area and the ability of blue-green solutions to manage climate impacts, and create and support ecosystem services.

In addition, the work of this thesis also supports municipality in formulating and investigating strategies to adapt the climate change to reduce or eliminate urban flooding risks in the two research areas of Lagan and Torsgatan street.

According to Scalgo Live, there is a high risk of flooding in the study areas that mainly affect residences and residential streets. It is recommended to take appropriate blue-green measures to regulate the rainwater runoff in the upstream and downstream areas.

Flooding in basements mainly comes from the rainwater pipe system and the leakage of the sewage pipe system, which are vulnerable to the high-water level in the condition of heavy downpour. If waste water is spilled into the environment, heavy rain and improperly designed rainwater systems may pose a threat to health and the environment due to floods.

Flooding often occurs, so it is recommended to change the current drainage system layout and check the old pipes of the sewer system and rainwater system.

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