This thesis aims to study the hydrological and hydrogeological consequences due to rapid and large-scale urbanization through a literature review of three cities. The catchment area of one of the three cities is further studied by computing surface runoff and amount of infiltration through the ground surface for two different years, using software such as extension tools of ArcGIS and HEC-HMS.

Shanghai, Hanoi and Bengaluru cities were chosen for the literature review. These cities face different consequences due to rapid and large-scale urbanization. One of the catchment area of Bengaluru city namely Vrishabhavathi valley, was used to estimate the surface runoff and amount of infiltration through the ground surface by numerical simulations.

Shanghai mainly faces land subsidence due over exploitation of groundwater. In the case of Hanoi, the city faces water quality degradation and a phenomenon called “heat island”. Flooding during monsoon, was one of the major effects faced by the Bengaluru city, as the city’s lake areas have been encroached which once acted as flood controllers.

The estimation of surface runoff and amount of infiltration through the ground surface was carried out on Vrishabhavathi catchment area in Bengaluru city. The year 1975 and 2017 were selected for past and present scenarios respectively. According to the simulation, the surface runoff was more important for the year 2017 whereas the amount of infiltration through the ground surface was larger for the year 1975.

Generally, rapid and large–scale urbanization does have effects on the hydrological and hydrogeological processes. Care should be taken before the city is expanded, and measures such as artificial recharge, rainwater harvesting and flood management should be taken.

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