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# Impact Assessment of Landuse Change on Peak Flowrate by Using Hydrological Model of Alibeyköy Watershed

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## Abstract

Floods causing loss of life and property indicate the importance of flood management in urban planning. Land use change due to unplanned urbanization causes flooding. Land use is rapidly changing as a result of increasing population and uncontrolled urbanization in Istanbul, Turkey. This change causes an increase in flood risk for residential areas. Computer modeling is a vital tool to predict the risk of flooding and to take precautions. These models have great importance in flood management and urban planning. Hydrological modeling which determines the relationship between precipitation and flowrate is of great significance in flood management. In this study, the Alibeyköy Watershed located in the northwest of Istanbul was investigated. New Istanbul Airport is located in Alibeyköy Watershed. Therefore, Alibeyköy Watershed is under pressure of intense urbanization where new settlement areas are planned. In this study, Quantum Geographic Information System (QGIS) program was used to obtain the necessary satellite data related to the watershed area. Land use maps for previous years were also obtained by using QGIS. By examining the settlement plans published for Istanbul, future land use map is forecast in the watershed. The change in the watershed was identified by comparing three different land use maps in the past, present and future. Hydrological model of the basin was generated by using Hydrologic Engineering Center-Hydrologic Modeling System (HEC-HMS) program. In order to calibrate the Hydrological Model, precipitation and flow data measured previously were used in the watershed. Finally, using the calibrated hydrological model, the results of the models generated for different land use in temporal scale were compared with each other. These results were evaluated and the hydrological impact of land use change in the watershed was investigated.

**Keywords:** Alibeyköy Watershed; HEC-HMS; Land use Change; QGIS.