

Flood Mapping and Inoudation on Weira River Watershed (in the Case of Hadiya Zone, Shashogo Woreda)

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Abstract : Exceptional floods are now prevalent in many places in Ethiopia, resulting in a large number of human deaths and property destruction. Lake Boyo watershed, in particular, had also traditionally been vulnerable to flash floods throughout the Boyo watershed. The goal of this research is to create flood and inundation maps for the Boyo Catchment. The integration of Geographic information system(GIS) technology and the hydraulic model (HEC-RAS) were utilized as methods to attain the objective. The peak discharge was determined using Fuller empirical methodology for intervals of 5, 10, 15, and 25 years, and the results were 103.2 m³/s, 158 m³/s, 222 m³/s, and 252 m³/s, respectively. River geometry, boundary conditions, manning's n value of varying land cover, and peak discharge at various return periods were all entered into HEC-RAS, and then an unsteady flow study was performed. The results of the unsteady flow study demonstrate that the water surface elevation in the longitudinal profile rises as the different periods increase. The flood inundation charts clearly show that regions on the right and left sides of the river with the greatest flood coverage were 15.418 km² and 5.29 km², respectively, flooded by 10,20,30, and 50 years. High water depths typically occur along the main channel and progressively spread to the floodplains. The latest study also found that flood-prone areas were disproportionately affected on the river's right bank. As a result, combining GIS with hydraulic modelling to create a flood inundation map is a viable solution. The findings of this study can be used to care again for the right bank of a Boyo River catchment near the Boyo Lake kebeles, according to the conclusion. Furthermore, it is critical to promote an early warning system in the kebeles so that people can be evacuated before a flood calamity happens.

Keywords: Flood, Weira River, Boyo, GIS, HEC- GEORAS, HEC- RAS, Inundation Mapping

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