Flood Inundation Mapping at Wuseta River, East Gojjam Zone, Amhara Regional State, Ethiopia

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Abstract : Flood is a usual phenomenon that will continue to be a leading risk as extensive as societies living and effort in flood-disposed areas. It happens when the size of rainwater in a stream surpasses the volume of the canal. In Ethiopia, municipal overflow events are suitable for severe difficulty in current years. This overflow is mainly related to poorly planned city drainage schemes and land use design. Collective with it, the absence of detailed flood levels, the absence of an early caution scheme and systematized flood catastrophe alleviation actions at countrywide and local levels further raise the gravity of the problem. Hence, this study produces flood inundation maps in the Wuseta River using HEC-GeoRAS and HEC-RAS models. The flooded areas along the Wuseta River have been plotted based on different return periods. The highest flows for various return periods were assessed using the HEC-RAS model, GIS for spatial data processing, and HEC-GeoRAS for interfacing among HEC-RAS and GIS. The areas along the Wuseta River simulated to be flooded for 5, 10, 25, 50, and 100-year return periods. For a 100-year return period flood frequency, the maximum flood depth was 2.26m, and the maximum width was 0.3km on each riverside. This maximum Depth of flood was extended from near to the journey from the university to Debre Markos Town. Most of the area was affected near the Wuseta market to Abaykunu new bridge, and a small portion was affected from Abaykunu to the road crossing from Addis Ababa to Debre Markos Town. The outcome of this study will help the concerned bodies frame and advance policies according to the existing flood risk in the area.

Keywords : flood innundation, wuseta river, HEC-HMS, HEC-RAS