

main components that played a significant role in the **analysis** of the flood were precipitation data, flow data, digital elevation data, land use and soil data.

The SCS CN loss method was a useful tool to simulate the rainfall runoff relationship. The curve number grid was generated from the union of land use and soil data of the catchment that ranges from 71 – 100. The dominating soil group of the catchment is clay soil which covers 78.72 % of the area categorized under HSG of “D” and loam soil which covers about 21.28 % of the catchment under HSG of “C”. The land use of the catchment was re classified under four as; agriculture, medium residential, water and forest for the generation of curve number grid.

The flooded areas along the Gelana River have been mapped based on the exceedance of highest flows for different return periods using the HEC-RAS model, GIS for spatial data processing and HEC-GeoRAS for interfacing between HEC-RAS and GIS. The areas along the Gelana River simulated to be inundated for 2, 10, 25, 50 and 100 years return periods. The velocity of 2, 10, 25, 50, and 100 years are; 5, 5, 5.1, 15.6, and 13.2m/s respectively.

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