

THESIS

DOMINATING FACTOR AFFECTING RAINFALL LAG FOR HILL
TORRENT WATERSHED: (A Case Study of the Vidore Hill Torrents)



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ABSTRACT

The D.G.Khan Hill torrent area is one of the 14 major hill torrent areas in Pakistan. It is located in the west of the river Indus in Punjab and shares boundaries with Sindh, Blochistan and North West Frontier Province (NWFP). The Suleiman hills a denuded mountain range with pachy soil cover, create hill torrent flash flows to the piedmont plains extending from the foot hills to river rain areas of the Indus. Vidore hill torrent area is located Suleiman range and piedmont plain and the later is further subdivided into canal irrigated area at the east of Dera Ghazi Khan canal and non irrigated area at the west of canal.

The time lag rainfall to runoff is very short which leads to flash flooding. Thus it is extremely important to understand the dominating factors affecting the rainfall runoff lag. In this study the time lag is computed form different set of storms from the raw data of Vidore hill torrent by Synthetic and Hydrographic approaches. During the phenomenon of flash flooding in hill torrent floods the Time Lag mostly depends upon the Climatic i.e. duration and intensity of rainfall and physiographic Factors i.e. Slope, Soil condition & vegetation of the catchment.

The effect of each climate and physiographic factors is assessed on the time lag to determine which factors placed significant role on time lag. The time lag of rainfall to runoff comes out to be 3 hours for Vidore catchment. The affect of soil type, slope and vegetation on time lag shows that slope play more significant role on time lag in comparison to other two factors.

On the basis of this study it is recommended that rainfall gauging network may be strengthen in the catchment area together with regular gauging of flow at the outlet to assess the exact quantum of available water. Secondly watershed management of Vidore catchments may be under taken to increase time lag together with construction of flow breaking structures likes dykes, retaining dams to utilize the surface water potential for irrigation.