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Development of rainfall intensity-duration-frequency constants, curves and nomographs for selected station Arni, dist. Yeotmal

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■ **ABSTRACT :** Rainfall intensity-duration-frequency relationship and nomographs are required for design of soil and water conservation structures. Rainfall IDF relation depends on the physical characteristics of rainfall occurring in a particular place. The rainfall IDF relationship can be expressed as, $I= (KT^a) / (t+b)^d$ in which, I is maximum rainfall intensity (cm/h), T is return period (years), t is duration (h) and K, a, b and d are location specific constants. These specific constants in above relationship vary location to location and calculated by evaluating the rainfall IDF relationship. The study was undertaken to develop the rainfall IDF relationship and nomograph for Arni tehsil of Yeotmal district of Vidharbha region. The required automatic rainguage charts were collected from Arni station of hydrology project. These rainfall charts were analyzed for maximum annual rainfall intensity of selected duration's *viz.*, 0.08, 0.16, 0.25, 0.5, 1, 2, 3, 6, 12 and 24 hours. The plotting positions were obtained by using the 'computed method' for development of frequency lines. Value of constants a and b were determined by using graphical method and the values of K and d were determined by using least square method. The values of constants K, a, b and d were found to be 3.148, 0.2074, 0.12 and 0.5574 for Arni station of Yeotmal district. The nomograph was developed for the IDF relationship for the same station.

■ **KEY WORDS :** Nomographs, Rainfall intensity-duration-frequency

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