

THESIS

**ANALYSIS OF RUNOFF PROCESS IN IRRIGATED RICE
AREAS**

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ABSTRACT

ANALYSIS OF RUNOFF PROCESS IN IRRIGATED RICE AREAS

Runoff estimation is a basic requirement for planning of a drainage projects. The main problem faced by the design engineers is to determine the quantity and peak runoff from a given irrigated rice areas. At present very little is known about the runoff processes in irrigated rice areas. This study was proposed to document the runoff process and peak runoff rate from these areas.

A small catchment area meaning 13.91 acres under rice crop was selected. The area was divided into 9 fields separated by 14 to 40 cm dikes. Data was collected for rainfall and outflow from individual fields and at the outlet. The water depth in individual fields was monitored to determine detention storage at various times. Runoff routing within the catchment was observed. The potential and actual runoff from various fields was analyzed and found to depend upon the irrigation application, rainfall and antecedent water depth in the fields. The detention storage was maximum during early stage of the crop and decreased with the later stages of the crop.

Out of 12 rainfall events varying from 0.34 cm to 4.00 cm depth , only one event (25-July, 1996) with rainfall depth of 3.72 cm could produce net runoff. Even a large depth of rainfall at other times did not produce runoff due to large antecedent detention storage. Potential runoff was generated from few fields for five other rain-storms but

it was completely detained in the next fields before reaching the basin outlet. The measured runoff hydrograph had a wide peak. The Dimensionless Unit hydrograph of the measured outflow differed considerably from the SCS dimensionless hydrograph.

From the Study it is concluded that all rain storms do not produce runoff and runoff potential depends upon the antecedent water depth in the fields. This in turn depends on the farmers irrigation practices. The runoff potential is greater during early and middle stages of crop growth when farmers tend to provide supplemental irrigation water as well as contain all rain water in the fields by maintaining the field dikes. It was observed that runoff process do not follow a sheet flow but follow as flow Through a cascade of reservoir. This study also revealed the major causes of difference which affect potential and actual runoff processes.

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