Annals of Arid Zone 26 (1 & 2) : 111-113, 1987

EFFECT OF GRAZING ON RUNOFF AND SOIL LOSS IN KAILANA RHYOLITE BASINS

K. A. SHANKARNARAYAN, K. D. SHARMA AND A. K. KALLA

Central Arid Zone Research Institute, Jodhpur-342003

About 20, 000 ha (9.4% of the total geographical area) in the western Rajasthan is rocky, gravelly and stony wasteland (Shankaranarayan et al., 1982) and is used as grazing land. Critical data on the effects of grazing on basin hydrology are lacking. Therefore, an attempt was made to obtain this information for rhyolite basins at Kailana plateaux lying in the outskirts of the Jodhpur town (26. 20°N, 73. 03°E). Precipitation (mean annual 360 mm) in the study area is characterised by convectional storms with relatively high intensity and extreme seasonal as well as annual variability.

The study was conducted at the Afforestation Research Station, of the Central Arid Zone Research Institute, at Kailana for two years (1979-80). Five contiguous rhyolite basins of 0.8 to 2.0 ha area having 3.6 to 8.0% slope were equipped with standard rain gauges, stage level recorders, 61 cm H-flumes and coshocton silt samplers to monitor the daily rainfall, runoff and sediment loss.

The soils were shallow to moderately deep sandy loam covered with gravels and pebbles at places. Vegetation, typical of the desert thorn forest (type 6B/CI with open stands of 10-13 plants/ha) comprised *Acacia senegal* (Linn.), *Prosopis juliflora* (Swartz) and *Prosopis cineraria* (Linn.) trees and *Ziziphus nummularia* (Burm. f.) Wt. bushes. The dominant grass species were *Cenchrus setigerus* (Vahl), *Eleusine compressa* (Forsk.) and *Aristida funiculata* (Trin.) having 1.9 to 4.6% basal cover (CAZRI, 1976). The five treatments, introduced in the rainy seasons (June to September) were: control (undisturbed, no grazing, no grazing but shrubs removed (trees and grasses retained) and three grazing intensities viz. light grazing (1 cow) moderate grazing (3 cows) and heavy grazing (4 cows) for 90 days.

Mean annual rainfall during the study period was 514. 5 mm, nearly 90% of which occurred as monsoon rains during June to September in 14 rainy days. In 1979, 8.7% storms representing 0. 2% of the total rainfall occurred as < 2.5 mm each whereas in 1980, 20. 0% storms representing 1. 6% of the total rainfall occurred in this category.

Both the peak flow and runoff yield increased with the severity of grazing (Table 1). Under heavy and light grazing, the peak flow increased by about 5 and 3 times,