

Role of Soil Clays for Watershed Management in Mewat Region of Haryana

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Abstract—Watershed management is an important technique for sustainable development of an area. A study was undertaken to assess the importance of clay fraction of soils in the management of Buraka micro-watershed in Mewat region of Haryana. The watershed is located in the foot hills of Aravallis comprising Buraka, Panchgaon and parts of Chila and Gwarka villages covering an area of 542.4 ha in Agro-ecological Subregion (AESR) No. 4.1. The elevation ranges from 259 to 340 m above MSL and slope varies from nearly level to steep, directed from south-east to north-west. The geology is sandstone and quartzite in hills and alluvium in plains. The area has been surveyed on 1:12,500 scale by using the Survey of India toposheets on 1:25,000 scale, cadastral maps on 1:4,000 scale and geo-coded IRS P6 LISS IV MSS imageries on 1:12,500 scale. Soil samples have been collected from different horizons of representative pedons as well as random (auger bores) observations in each interpreted physiographic units as per the heterogeneity of the terrains. Soil samples have been analysed for different physical and chemical properties using standard procedures. On the basis of image data interpretations and field checks seven landform units viz., hill tops, side slopes, inter hill basin, upper piedmont plain, middle (Buraka A to Buraka J) piedmont plain, lower piedmont plain and stream terraces have been identified in the study area. Ten soils have been identified and mapped into 21 soil mapping units as phases of soil series under Entisols and Inceptisols. The soil texture comprises sand, loamy sand, gravelly sandy loam and sandy loam covering 55.40 ha (10.22%), 133.90 ha (24.69%), 116.50 ha (21.48%) and 206.70 ha (38.10%), respectively. The soils of Aravalli hills are having gravelly sandy loam texture whereas in the plains it is sandy loam, loamy sand and sand. The particle size distribution i.e. sand, silt and clay ranges from 54.80 to 93.85%, 2.90 to 31.70% and 2.25 to 17.50%, respectively. The data also reveals that Buraka F soils (soil units 13 and 14) are having comparatively higher clay content (12.50 to 17.50% with a mean value of 16.38%), located in Buraka, Panchgaon and Chilla villages of the watershed area. Besides, these areas occur on nearly level to very gently sloping lands on relatively lower elevations. Hence, these areas of the watershed are potential for conserving water flown from uplands to down streams and can be used as water reservoirs for cultivation and livestock needs as well as for domestic use. On the basis of the present study, three sites have been identified for delineation of water harvesting zones for storing excess runoff water. This will help the farming community to meet their water requirements during the dry spells. By this way the chances of crops failure during droughts can be minimized and the agricultural productivity can be enhanced and sustained.

Key words: Mewat region, Buraka micro-watershed, landforms, soils, water harvesting zones