

Integrated watershed rehabilitation in dry lands: A case study of interventions in Dera Ismail Khan and Tank districts of Khyber-Pakhtunkhwa

Wajid Ali, Samina Siddiqui, M. Asif Khan, Shabir Ahmad

National Centre of Excellence in Geology, University of Peshawar

Email: wajeedaali@gmail.com

Watersheds are a complex of soils, landforms, water, vegetation and land uses; watershed management forms a crucial step in Sustainable Utilization and Management of Natural Resources, especially, soils, surface and groundwater, forests and agriculture. Dry lands are the most fragile and vulnerable bio-physical systems. Dry lands are characterized by acute water scarcity, erratic rainfall patterns, pronounced soil degradation, low levels of soil moisture and organic matter and sparse vegetation cover. Among others the impending threats of climate change and desertification always linger over such regions. The Watershed Rehabilitation Project Team of National Centre of Excellence in Geology, University of Peshawar, demonstrated a number of effective technologies in the Paniyala watershed, Dera Ismail Khan and Yar Manji Khel area of Tank Districts. Based on Aridity Index, the project sites are situated in dry-lands ($AI < 0.65$), the mean annual rainfall in Dera Ismail Khan Region is 272 mm and Tank region is 292 mm. The potential evaporation is 2015 mm and respectively 2514 mm. Among the interventions were loose stone check dams for gully erosion control. Earthen Gully Plugs for gully erosion control, run-off harvesting, sediment control and ground water recharge. Spillways were installed on terraces for run off control and as an effective means of distributing water. For the first time in the region, the utility of in situ rain water harvesting was demonstrated successfully using semi-circular micro catchments, Negarim micro catchments and Planting Pits (Zai). Similarly, experimentation with drip bucket irrigation system for growing vegetables was successful. For On Farm Water storage Large Run-off harvesting ponds were demonstrated successfully to address the scarcity of water resources for irrigation. The rainwater harvesting Taanka was modified in to an on farm water storage tank (capacity 72 cubic meters), which enables the farmer to store his allocation of water for use according to an irrigation schedule. Interventions in Yar Manji Khel area of Tank districts focused on rod kohi/spate irrigation methods for flood water harvesting. Water application and distribution structures not only enables the local community to utilize run off for agriculture purposes but also helps in the addition of nutrient laden sediments to their land. The interventions have shown good results and acquired acceptability among the local populace. After project interventions some previously un-cultivable land has come under cultivation and preliminary results show progress made in soil and water conservation aspects. The interventions and the results of the project could serve as a model for watershed management and rehabilitation in other areas of FATA and Khyber Pakhtunkhwa.