Siting of rainwater harvesting locations in District Haripur using Geographic Information Techniques

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Rainwater harvesting is important step towards maximizing the water availability and land productivity in the arid and semi arid areas of Pakistan. However, the selection of appropriate sites for rainwater harvesting on a large scale presents a great challenge. GIS and RS technologies proved best in identifying the potential sites for rainwater harvesting in Ghazi Tehsil, district Haripur covering 348 sq km area, which has great potential due to its feasible climatic and topographic conditions. The area receives good rainfall annually but, due to hilly terrain the runoff is high and most of the rainwater is being lost. In spite natural gift of rainfall water the local community of the study area is used to practice the rainfed agriculture, therefore, the rainwater harvesting is given priority in order to enhance agricultural output. Soil Conservation Service's (SCS) Curve Number (represents the effects of rainfall against Hydrological Soil Group and landcover) was computed using HECgeoHMS tool of ArcGIS 9.3. The curve number was then used as input parameter in runoff estimation method to compute the surface runoff potential for different combination of landcover and Hydrological Soil Groups (HSG) in the study area, which helped in the results to identifying the potential sites for rainwater harvesting. It was observed that runoff was higher at the mountainous areas and low at the plain. Various thematic maps of the area such as surface slope, drainage network, rainfall, landcover, landuse, soil, geology and buffer maps at a scale of 1:50,000 were generated in GIS to perform weighted overlay analysis. Reclassification of above mentioned layers were performed and weights were assigned according to technical guidelines, suggested by Integrated Mission for Sustainable Development (IMSD), Indian National Committee for Hydrology (INCOH), Food, and Agricultural Organization (FAO) and also keeping in view the study area topographic and climatic conditions, in order to identify the potential sites for rainwater harvesting. About 20 percent of the area is suitable, 52 percent is less suitable and 29 percent is not suitable. Relative suitability was assigned to the results of suitable sites for rainwater harvesting. This was further used as input in order to identify the potential sites for different rainwater harvesting structures like farm ponds, Check dams, Nigarims and gully Plugs. The study results revealed that 10 percent of the area was suitable for farm ponds, 5.74 percent area for check dams, and 21.5 percent for Nigarims and percent of the area suitable for Gully Plugs. The small dams organization Peshawar conducted field survey and suggested two on sites namely Site A (*Khairbara*) and Site B (*Kotehra*) in the study area. In order to compare the GIS derived and field based results, it was evident that field based derived results were exactly overlaid on GIS results of Check Dams and Gully Plugs and Nigarims.