ABSTRACT

The southern part of Afghanistan, Kandahar province is characterized by an arid climate; the annual rainfall is insufficient for crop, people and animal. A systematic identification of areas suitable for different forms of rain water harvesting (RWH) may effective contributes to the local people. By integrated GIS (Geographic Information System) and RS (Remote Sensing) based methodologies, mapping solution was developed to find a suitable site for rain water harvesting. Land use and Land cover change classification were derived from Landsat 5 image (1992 and 2011) with overall accuracy assessment of 87.23 % and 86.68% in 1992 and 2011 respectively.

The outcome of the change was determined for the period 1992 to 2011. It was found that built up land has increased for 3.33 % (579.49 sq.km), while water decreased for 1.04% (180.09 sq.km). In addition, vegetation is found to be decreased at the rate of 7.62 % (1325.00 sq. km), while the bare land increased up to 5.32% (925.60sq.km), According to the analysis, The total changes in the study area in major land use and land cover equal to 17.48% (3010.18sq.km).

In recognizing suitable area for rainwater harvesting, seven thematic layers (slope, land use, flow accumulation, rainfall and soil texture, population density, distance from road) were applied. Pair- wise importance weight and rate were also derived from Analytical Hierarchy Process (AHP) method.

In summary, high suitable class was found to be 9315.63sq.km (17.41%), while moderate class was 9521.54sq.km (17.80%) and low suitable class was 8512.33 sq.km (15.91%) and not suitable class was found to be 26150.50 sq.km (48.88%). Five districts will get benefit from the harvested water where 216700 people are living.

Keywords: Rainwater harvesting, Land use Land cover GIS and RS Afghanistan, Kandahar