

ABSTRACT

Assessment of hydrological effects of the land use transformations on both water yield and flow regimes are of vital importance aspect in watershed management. Dealing with water management issues requires analyzing of different elements of hydrologic processes taking place in a watershed area. In the present study, hydrological response of the Chirah watershed (located in the sub-Himalayan region) was studied to historical land use evolution and variable land use change scenarios using SWAT -Soil and Water Assessment Tool model. Three scenarios are developed to study effect of land use change in future. In the first scenario forest is converted into agriculture land (about 80% increase in agriculture land) which indicates 2.5 % increase in water yield, about 10.5 % increase in surface runoff while ground water recharge decreased by 1.9 % . In the second scenario forest is converted to rangeland (about 80 % increase in rangeland) which gives 3.2 % increase in water yield, 7.7 % increase in ground water recharge and surface runoff is also increased by 4.4 % . In the third scenario all other land covers are converted to forest to study hydrological parameters if afforestation takes place which gives 2.5 % increase in water yield while surface runoff and ground water recharge is decreased by 1.2 % and 3.8% respectively. Results shows that surface runoff is increased due to deforestation that may lead to flash flooding so government and local communities should play their role to overcome this and should adopt afforestation techniques.

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ABBREVIATIONS

MTIP	Medium term investment plan
SWAT	Soil and water analysis tool
PCRWR	Pakistan council of research in water resources
GIS	Geographical information system
RS	Remote sensing
PMD	Pakistan meteorological department
WAPDA	Water and power development authority
DEM	Digital elevation model
UTM	Universal transverse mercator
RMSE	Root mean square error
HRUs	Hydrological response units

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