Research Paper   **Engineering**

Assessment of Runoff using Mapwindow SWAT hydrological Model: Case Study of Sabarmati river

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ABSTRACT

The study area is covering Sabarmati river from Gujarat portion to Vasna barrage which is situated down-stream of Ahmedabad city. In present Study, hydrologic response of the watershed to precipitation is situated in order to estimate the runoff using MAPWINDOW SWAT and find runoff for each mini watershed.

Keywords : Map-Window, Swat, Runoff

INTRODUCTION

The water and land resources need to be developed, utilized and managed in an integrated and comprehensive manner. With the advancement of the computer technology, GIS and Remote Sensing have become efficient tools to integrate the spatial and non-spatial data bases for the hydrological modelling. A number of advanced techniques have been developed for water resources planning and management like system approach to mathematical modelling, GIS and Remote Sensing and Watershed Management.

Hydrological modelling and its integration with GIS have lead to the development of powerful tool for predicting runoff and other parameters. AGNPS, CREAMS, GLEAMS, SWRRB and SWAT.

Soil Water Assessment Tool (SWAT)

SWAT is the most recent one used successfully for simulating runoff, sediment yield, evapo-transpiration and water quality of small watershed. There are such application of SWAT canopy storage, infiltration, redistribution, evapo-transpiration, lateral sub surface flow.

STUDY AREA

Sabarmati river water deficit lies on the west coast of India between latitudes 220 N to 250 N and longitudes 710 E to 730 30' E, and is spread across the states of Rajasthan and Gujarat. After travelling 48 km in the state of Rajasthan, it enters the Gujarat state, the river joins the Gulf of Cambay after travelling 323 km in Gujarat.
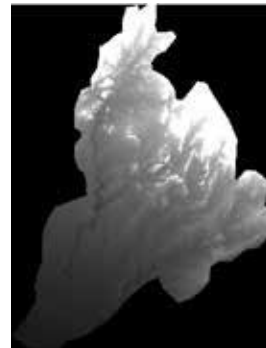
The study area is taken in to part of Gujarat up to Vasna barrage, located and of the Ahmedabad city.

ANALYSIS

The following maps are carried out from the Digital Elevation Model (DEM) of the study area.

- Land use/ Land cover Map.
- Soil Map.
- Mask Map.
- Contour Map.
- Stream Map.
- Rain-gauge Station Map.

Digital Elevation Model (DEM)

METHODOLOGY

- Data Collection.
1. Collected Data
2. Remote Sensing Data
- Integrate with GIS.
- Input in MWSWAT.
- Run the MWSWAT model.
- Conclusion.

CONCLUSION

The SWAT model is used on Sabarmati River to calculate the flow at vasna barrage. The SWAT hydrological model successfully used to calculate surface runoff of each mini watershed individually of the study area. SWAT model generate automatically delineate the watershed and 29 mini watershed was generated. The sensitivity analysis was done by changing the number of rain gauge station in the catchments area.

REFERENCES

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