EFFECT OF CROP MANAGEMENT PRACTICES ON WATER BALANCE COMPONENTS IN AN AGRICULTURAL CATCHMENT

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Background: The water balance of a catchment and its response to anthropogenic forcing is complex and underscores the need for modelling studies apart from historical observations. Crop management practices can have significant impact on the water balance components in a region. From this perspective, understanding the hydrology of Bharathapuzha river basin (BRB) with specific consideration to its crop management practices is of paramount importance as it flows through areas with intense paddy farming. Moreover, the catchment area has suffered from extreme flooding and dry events in the recent warming climate, with parts of the catchment under severe water stressed condition.

Method: The water balance components of BRB was estimated by employing the SWAT model with different levels of management operations to study the impact of water management on the water balance components.

Results: The water balance components of the model setups with and without crop management practices, show statistically significant differences between them. The model configuration with irrigation operations results in 6% decrease in the catchment water yield. This can be attributed to the allocation of water for irrigation, causing a reduction in the amount of water flowing into the river channel.

Conclusion: Crop management activities have significant impact on catchment water balance components.

Keywords: Water Balance, Hydrological Modelling, Crop Management, Irrigation Scheduling