IRRIGATION MANAGEMENT FOR RICE USING GEOGRAPHIC INFORMATION SYSTEMS

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Introduction

A complex of factors contributes to the management of an irrigation scheme. Physical and engineering factors have to be integrated with agronomic, socio-economic and human behaviour. A GIS based model can combine the physical and agronomic factors and summarise large amounts of information and present them in easily understood tables, maps and graphs. This information is easily understood and is valuable to the irrigation manager or engineer for decision making considering many variables.

Materials and Methods

The Kerian Irrigation Scheme was selected for the study, where a digitised map was produced using the GIS Software. Physical details of the scheme such as the location of canals, drains, control structures, water sources were located on the map. Information on these was input to the respective data-bases. Based on these, a model was developed for determining irrigation requirements for specified periods. It will display what happened in terms of rain, evapotranspiration, canal discharge, drainage during the previous period and to use these data settings for the next period.

Results and Discussion

The model was developed based on two planting seasons and relationships in the plot and field water balance were developed. The model showed graphically and in the form of maps, the on-going events in the scheme. Performance indicators like Water Use Efficiency, Relative Water Supply are also displayed and plotted on the map for all fields or plots. From the point of irrigation the predicted canal diversion can be compared with the actual diversion to arrive at a decision for the next period. In terms of Relative Water Supply for the 3 block in compartment F had values ranging from 0.05 to 2.92 for main season and 0.10 to 1.78 for off-season respectively. The ideal value should be between 1.5 to 2.0 for an adequate supply relative to demand. Values different from these indicate over supply or under supply.

Conclusions

The Geographical Information Systems based model is a user friendly management tool, which was able to process and summarise a large volume of data to aid decision making in an irrigation scheme.