

## INDICES OF PERFORMANCE FOR CONTINUOUSLY IRRIGATED RICE CULTIVATION

C.Y. Kwok, Md Sham Mumin and T.S. Lee

Faculty of Engineering  
Universiti Putra Malaysia, 43400 UPM, Serdang, Selangor,  
Malaysia

**Keywords:** continuous irrigation, indices, performance.

### Introduction

Many rice farmers prefer to irrigate the fields continuously. Indicators of irrigation performance have been developed for upland irrigation or if it is used in rice rotational or intermittent irrigation is practised. When applied to continuous irrigation extremely low efficiencies result. The aim of irrigation is to maintain the water at a predetermined level. Based on this premise, the water needed or wasted to maintain this target was used in the index.

### Materials and Methods

A plot was selected in the Kerian Irrigation Scheme (Alfredo Valera et al. 1991) and all parameters contributing to the water balance of the plot were measured continuously. Irrigation inflow and outflow were measured using Parshall flumes. The water level in the field was also measured. Rainfall was recorded using an Electronic Pluviometer. Evapotranspiration was however measured manually each day. All other values were data logged. These measurements were made over one season.

### Results and Discussion

The design water depth was used as the criteria for irrigation performance. Two indices were suggested. The first was Effective Water Use index or EWUI, which is the ratio of Effective Water Use to Effective Supply. The target value is 1. If it is greater than 1 then this indicates inadequate supply. A value less than 1 shows the insufficient supply. The second, the Plot Consumption Index is one minus the Drainage Supply Ratio. The target value is 1. If it is less than 1 then it indicates over supply or excessive irrigation. If it is a negative value there is excessive drainage, which could result from heavy rainfall or uncontrolled inflow from adjacent plots. In the study, values of PCI on a weekly basis showed an initial value of 0.12 increasing to a maximum of 0.68 at midseason. Both these indices were able to show when the plot was receiving excess or insufficient water with regards to meeting the target design water level.

### Conclusions

These indicators could be used as indicators of irrigation performance (Nihal, 1991) at the plot level. However the values assigned as the criteria will initially need some familiarisation by users.

### References

- Alfredo Valera and Mohd. Nor Bin Hj. Mohd. Desa 1991. Design-Management Interactions of Malaysia's Kerian Irrigation Scheme. International Irrigation Management Institute (IIMI). p. 1-64.
- Nihal, F. 1992. Monitoring Irrigation Water Delivery Performance: The Concept of Cumulative Relative Water Supply (CRWS). Advances in Planning, Design and Management of Irrigation Systems as Related to Sustainable Land Use, Belgium, 1992. p. 525-534.