A MARKOV CHAIN MODEL FOR DAILY RAINFALL DATA

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The use of daily rainfall data for answering questions of agricultural importance has received much attention in the recent past. In particular, aspects such as the distribution of dry spells and the start and end of the rainy seasons have been studied in detail. The direct method of analysis (eg. Stern et al 1982) is adequate provided long rainfall records, (eg. more than 50 years) are available.

However for shorter records the precision achieved when looking at particular events is low. The modelling approach provides a method of overcoming this problem.

A Composite Markov Chain model for modelling for occurence of rain as well as the amount of rain is outlined.

Examples using data from Jaffna and Frocester are given. Details of how such models can be used for agricultural purposes are outlined. In particular, aspects such as dry spells and amounts of rain are looked at.

Finally, some shortcomings of the model are highlighted. In particular the Markov chain model was found to be inadequate for modelling long sequences of dry and wet spells.

References

Coe R. and Stern R.D. (1982) Fitting models to daily rainfall data. J.Appl. Meteor, 21: 1024 - 1031

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