Hydrol Current Res 2014, 5:4
http://dx.doi.org/10.4172/2157-7587.S1.015

OMICS Group Conferences
Accelerating Scientific Discovery

3rd International Conference on
Hydrology & Meteorology
September 15-16, 2014 Hyderabad International Convention Centre, India

Yield forecasting for rice in Cauvery delta zone of Tamil Nadu using space, agro meteorology and land based observations

P Parasuraman, G Senthilkumar, E Subramanian, R Pushpa and R Rajendran
Tamil Nadu Rice Research Institute, India

Rice is the principal crop of Cauvery Delta Zone (CDZ). District Level Rice Yield Forecast for Delta districts viz., Thanjavur, Thiruvarur, Perambalur, Nagapattinam, Cuddalore, Ariyalur and Trichy was issued by using Statistical Model at mid-season (F2) and pre-harvest stage (F3) during Kharif, 2013 and Rabi 2013-14. The forecast has been developed by using crop yield data considering four weather variables (Maximum and Minimum temperature, Rainfall, Morning and Evening Relative Humidity) with Long term weather (1995-2013) and historical crop yield (1995-2011) data. During Kharif, 2013 the highest paddy yield of 3929 kg/ha has been predicted for Thanjavur district while the lowest yield has been predicted for Tiruvarur district (3287 kg/ha). The major rice varieties grown in Cauvery delta zone during Kuruvai season is ADT 43, ADT-45 and ADT 36. In F3 forecast, higher paddy yield of 3853 kg/ha was predicted in Thanjavur district followed by Nagapattinam district (3575 kg/ha). Lower yield of 2909 kg/ha was predicted in Cuddalore district. Verification on yield forecast by using actual yield indicated that actual yield was more than predicted yield in all the districts .The error percentage varied from 1.5 to 23. The lacunae in the statistical model is that it is taking into consideration of the weather parameters prevailed during the season only and not the management practices adopted by the farmers. During Rabi, 2013 season the highest paddy yield of 3955 kg/ha has been predicted for Tiruvarur district. The major rice varieties were CR1009, ADT 46, and BPT 5204. During F3 forecast, Perambalur district registered higher rice yield of 3717 kg/ha and Ariyalur district recorded lower yield of 2784 kg/ha. Verification of yield forecast by using actual yield indicated that actual yield was less than predicted yield in two districts (Karur and Perambalur) and actual yield was more than predicted yield in Thanjavur, Thiruvarur, Nagapattinum, Trichy, Ariyalur and Cuddalore. The error percentage was very less in Perambalur (-0.5) followed by Karur (-2.8). Tiruvarur and Cudadalore recorded the highest error percentage of 25.2, 29.1 respectively.

Biography

P Parsuraman has completed his PhD at TNAU, Coimbatore during 1993. After completing his service in various capacities, at present he is working as rice Agronomist under AICRIP system. He has published more than 25 papers in reputed journals and has been serving as an editorial board member of reputed Journal like Indian Journal of Agronomy, Mysore Journal of Agricultural Sciences etc. His field of specialization is agricultural meteorology, INM, weed management and dry farming.

parasuraman.p@gmail.com

River flow forecasting using higher order neural networks coupled with wavelet analysis

Mukesh K Tiwari[1] and C Chatterjee[2]
[1]Anand Agricultural University, India
[2]Indian Institute of Technology, India

Daily river flow forecasting is an important component of effective and sustainable management of water resources. Accurate predictions of daily river flow can play a significant role for water resources planners and managers. Performance of traditional Neural Network models weakens with Non-Stationary dataset. To improve the NN model performance, a novel approach based on coupling discrete wavelet transforms (DWT) and higher order neural networks (HONNs) for river flow forecasting is explored in this study. HONNs-wavelet based HONNs (WHONNs), multiple linear regression (MLR) and wavelet based multiple linear regression (WMLR) models are developed in this study for river flow forecasting in the upper Mahi river basin, Gujarat, India. The performance of the developed models is evaluated using the coefficient of determination, Nash-Sutcliffe coefficient, root mean square error, and mean average error. The key variables used to develop and validate the models are daily precipitation, daily maximum temperature and daily river flow. It is found in this study that the WHONNs models are found to provide more accurate river flow forecasts than the HONNs, WNNs, WMLR and MLR models. The results of this study indicate that coupled wavelet-higher order neural networks (WHONNs) models improve the performance significantly and can be used successfully for accurate and reliable river flow forecasting.

tiwari.iitkgp@gmail.com