

Growth rates of rice through non-linear models

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Abstract

The god *Shiva* called rice *Vrihi*, in Sanskrit. India is one of the original centres of rice cultivation. The rice harvesting area in India is the world's largest. Indian rice cultivation is found in all states, but West Bengal, Uttar Pradesh, Madhya Pradesh, Orissa and Bihar are the major producing states. Rice is the staple food for 65% of the total population in India. The Indian population was about 1 billion people in 2000 and is still growing at a high rate (1.7% per year). Although the country exports several varieties of rice, many scientists have expressed concern that current Indian rice production techniques cannot sustain the growing domestic population. India has a large number of rice dishes and many of them are very simple to prepare. Indian pilaf rice is very flavourful and fluffy when cooked with Basmati rice.

The usual parametric approach for growth rate analysis is to assume multiplicative error in the underlying nonlinear geometric model and then fit the linearized model by "method of least squares". This paper deals with a critical study of rice yield of India and states-wise with a non-linear approach. The available data of rice during different years is taken into consideration and different statistical models are fitted for that. The time series data on annual production of Rice in India from 1962-2006 were collected from various sources. Growth rates are computed through non-linear models viz., Logistic, Gompertz and Monomolecular models and all three nonlinear models are suitable to fit.