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International Research Journal of Agricultural Economics and Statistics
Volume 3 | Issue 2 | September, 2012 | 197-201

Research Paper

Structural changes in cropping pattern in Northern transitional zone of Karnataka

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ABSTRACT : Changes in cropping pattern was studied by using Markov chain analysis and the results showed that the area under maize and chickpea showed most instability and area under cotton was most stable in period I. While in period II, except for paddy, all the crops considered in the study have shown stability and area under maize was most stable.

KEY WORDS : Cropping, Pattern, Structural change

HOW TO CITE THIS PAPER : Kammar, Aravind and Basvaraja, H. (2012). Structural changes in cropping pattern in Northern transitional zone of Karnataka, *Internat. Res. J. agric. Eco. & Stat.,* **3** (2) : 197-201.

***Paper History* : Received :** *14.09.2011;* **Revised :** *10.04.2012;* **Accepted :** *11.06.2012*

INTRODUCTION

A change in cropping pattern implies a change in proportion of area under different crops. It has significant bearing on widening the geographical inequalities in income distribution. A dynamic change has been witnessed in agricultural scene in our country, particularly during post-green revolution period. Cropping pattern refers to adoption of particular type of crops by the farmers in a particular region. It is expressed at macro level, that is, district, taluk or village level. Hence, present study was conducted with the specific objective to analyze the structural changes in cropping pattern over the years in Northern transitional zone of Karnataka.

MATERIALS AND METHODS

For the purpose of analyzing the changes in cropping pattern and factors contributing to it, Northern transitional zone of Karnataka was purposively selected. The Northern transitional zone cuts across four districts encompassing 14 Taluks of Karnataka (Table A). The time series data were obtained for a period of 30 years (1977-78 to 2006-07) which were further divided into two sub-periods as pre-liberalization (1977-78 to 1990-91) and post-liberalization(1991-92 to 2006-07) periods. The data were collected from various issues of "District at a glance" of from 1977-78 to 2006-07.

Markov chain analysis:

The Markov chain analysis is an application of dynamic programming to the solution of a stochastic decision process that can be described by a finite number of states.The Markov process was used to study the shifts in the shares of crops which facilitated the understanding of the dynamics of crop changes.

The Markov probability model:

Any sequence of trials (experiments) that can be subjected to probabilistic analysis is called a stochastic, process. For a stochastic process it is assumed that the movements (transitions) of objects from one state (possible outcome) to another are governed by a probabilistic mechanism or system. A finite Markov process is a stochastic process whereby the outcome of a given trial t (t=1, 2,……,T) depends only on the outcome of the preceding trial (t-1) and this dependence is the same at all stage in the sequence of trials. Consistent with this definition, let Si = be the i^{th} state of r possible outcomes; i=1, 2, ……, r ,W_{it} = be the probability that state S_i occurs on trial t or the proportion observed in trial t in alternate outcome state I of the multinomial population based on a sample of size n, *i.e.* Pr (S_{it}), P_{ij} = Represents the