Changes in Cropping Pattern in Jammu and Kashmir

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Abstract

The aim of the present paper is to understand the changes in the cropping pattern in Jammu and Kashmir. This paper will also give some suggestion for improving the cropping pattern in Jammu and Kashmir. The Regression analysis has been done in order to see causal relationship between area and production. The cropping pattern of Jammu and Kashmir was based on the traditional system of the subsistence farming without any surplus. But with the advent of New Agricultural Strategy, there emerged the complementary relationship between the commercialization and cropping pattern of the state. The state of Jammu and Kashmir has micro-level variations in the agro-climatic conditions. The agro-climatic variations supported different types of cropping patterns in the state, however, it was the availability or unavailability of irrigation facilities which played a key role in determining the cropping structure in the state. The study revealed that the crop sector of Jammu and Kashmir agriculture at an aggregate level is gradually diversifying in favour of high-value crops. However, while analyzing the diversification, the Jammu division is witnessing a specialization in food-grain crops, while as Kashmir division depicting a trend towards diversification. The farmers are gradually diversifying to commercial crops for the sake of higher earnings.

Keywords

Cropping pattern, Crop diversification, Food crops, Jammu and Kashmir.

I. Introduction

Agriculture is the predominant sector in the economy of Jammu and Kashmir. Directly and indirectly, it supports about 80 percent of the population besides contributing nearly 60 per cent of state revenue, which adequately explains the over dependency of the population on agriculture. The overall economic growth of the state depends largely on the progress of agricultural sector, the development of which becomes even more important in the context of the very nominal progress it has made in secondary sectors with the introduction of planned development of food grains considerably. Jammu and Kashmir is divided into three agro climatic zones cold arid desert areas Ladakh, temperate Kashmir valley and humid sub tropical region of Jammu. Each has its own specific geo-climatic conditions which determines the cropping pattern and productivity profits. Rice is the chief crop of Kashmir zone, followed by maize, barley and wheat. Jammu region dominates both in maize and wheat production. In the Ladakh region, barley is the major cereal crop followed by wheat. The production of three important food crops, namely, rice, maize and wheat, contributes a major portion of the food grain in the State and accounts for 84 percent of the total cropped area; the balance 16 percent is shared by inferior cereals and pulses. nearly 75 percent of the country temperate fruits, mainly apples, are grown in the state.

The cropping pattern of a region reveals the proportion of area of land under different crops at a point of time, the rotation of crops and the area under different crops. The cropping pattern changes in space and time. In fact, no cropping pattern can be good and ideal for all times to come. The cropping systems of a region are decided by and large, by a different types of soil and climatic parameters (existence of cold arid, temperate, intermediate and sub-tropic zones) which determine overall agroecological setting for nourishment and appropriateness of a crop or a set of crops for cultivation. Nevertheless, at the farmer's level, potential productivity and monetary benefits act as guiding principles while opting for a particular crop/cropping system. These decisions with respect to choice of crops and cropping systems are further narrowed down under the influence of several other forces related to infrastructure facilities, socio-economic factors and technological developments, all operating interactively at micro-level. The prevalent cropping system of any locality is, therefore, the cumulative result of the past and present decisions by individuals, communities or governments and their agencies. The cropping pattern plays a vital role in determining the level of agricultural production and reflects the agricultural economy of an area/region. A change or shift in cropping pattern implies a change in the proportion of area under different crops which depends, to a large extent, on the facilities available to raise crops in the given agro-climatic setting. Moreover, the natural, social, economic and historical factors which determine the cropping pattern of a region, the cropping pattern also changes in consonance with the government policies and technological innovations especially in agriculture.

II. Review of Related Literature

A thorough review and survey of related literature forms an important part of research. It deals with the critical examination of various published research, enables the researcher to define the frontiers of his fields. The format of a review of Literature may vary from discipline to discipline. A review may be self- contained unit ... an end in itself... or a preface and rational for engaging in primary research. A review is a required part of grant and research proposals and often a chapter in theses and dissertation.

Cropping pattern means the proportion of area under different crop at a point of time, change in this distribution over a period of time and factors affecting this change in distribution (Misra & Puri ; 2011). Cropping pattern is a dynamic concept as it changes in time and space. Cropping pattern in a state keep on changing from time to time with the change in related factors. It is determined mainly by physical, socio-cultural and historic factors. Besides technological factors have also played an important role. For example HYV Programmes. In 1962-63, the IADP was introduced in the state in two districts i.e. Jammu (In Jammu division) and Anantnag (In Kashmir division). This programme were encouraging the production of paddy, wheat, and maize. The state of Jammu and Kashmir has higher degree of variation in its cropping pattern, crop combination and crop diversification (Hussain; 2000). The cropping pattern of the state by and large had a subsistence in nature during the Dogra rule. Cropping pattern was highly biased towards food crops with paddy, maize and wheat. Paddy, maize and wheat accounting for about 73 percent of total gross cropped area in 1938-39. The cropping pattern was reversed with the independence of the state. After independence ,the state government take certain initiatives to transform the traditional agriculture into modern one joint with the institutional and technological reforms thereby, liberating the agriculture of the state from the shackles of stagnation. During the sixties, the introduction of high yielding varieties of seeds and fertilizers and provision of assured irrigation gave a boost to the production of agriculture (Singh; 1998). The impact of the cropping pattern in the state was not uniform due to different topography and agroclimatic conditions. There was shift of cropping pattern in favour of commercial crops which may attributed to the development of infrastructure, like roads, bridges and irrigation. Technological innovation also influenced the cropping pattern on the state in many ways. It can be the asserted that after the introduction of New Agricultural Strategy (development of Agricultural Land, mechanization, manures and use of HYV seeds), there has been the complementary relationship between the commercialization and cropping pattern of the state. For the sake of higher earnings, the farmers has been switched from cereal crops to non cereals crops. The provision of pesticides, transport and cold storage to ensure disease free maturation and delivery of fruits in various market played an important role in diversion of cereals and other land to orchard (Misri and Bhat ;1994).

From the above mentioned reviews, it is revealed that varied and diverse research has been done in the field in an efficient manner. It is evident that many research related to Cropping Pattern in different states of India has been done in different angles from different variables but least research work is done in Jammu and Kashmir. As we know that the state has higher degree of variation in its cropping pattern, crop combination and crop diversification. So, there is still need to work on the same field and to make agriculture more remunerative, as it is important to bring business in agriculture based on the demand of consumers.

III. Objectives Of The Study

- To find out the area covered under different Crops in Jammu 1. and Kashmir.
- 2. To find out the growth of Agricultural Crops in the Jammu and Kashmir.
- 3. To find out the changes in cropping pattern in Jammu and Kashmir.
- To give some suggestion for improving the cropping pattern 4. in Jammu and Kashmir.

IV. Hypotheses

- 1. Over the years there is consistency in the growth of Agricultural crops.
- There is positive relationship between Area and Production 2. of agricultural crops.

V. Research Methodology

Keeping in view the status of the research work, the data has been collected from the secondary sources. The present study conducted for Jammu and Kashmir State pertains to the period of 2005-06 to 2012-13. The data has been collected from government official records, valid records of the state government, Directorate of Economics and Statistics, Jammu and Kashmir, Department of Financial commissioner revenue, Jammu and Kashmir, Department of Agriculture, Jammu and Kashmir, various published reports, books, journals, statistical digest and other official record from outside and within the state. The production under different crops has been analyzed through regression model. The area under different food crops has been analyzed and interpreted through tabulation and simple percentage method.

 $Y = \beta 0 + \beta 1 X 1 + Ut$

Where,

Y- Dependent variable

X- Independent variable

 β_0 - Intercept

 β_1 - coefficient (Slope)

 $U_t = \text{Error term}$ Growth rate = $Y_c - Y_b / Y_b *100$ Where

 $Y_c =$ value of variable in current year $Y_b =$ value of variable in base year

VI. Results and Discussion

Agriculture in recent years has emerged as an important sector and growing sub-sector of the Jammu and Kashmir. The State is famous for its Agricultural produce both in India as well as abroad. The State offers a wide range of choice to the farmers for the cultivation of various chief crops such as Maize, Rice, Wheat, fruits and Vegetables etc. Jammu and Kashmir is home to growing all varieties of fresh and dry fruits. Fruits and vegetables contribute more than 30 percent to value of output from agriculture in Jammu and Kashmir. During the past few years, the demand for highvalue crops has been showing much faster growth. These crops have potential of income augmentation, employment generation, poverty alleviation and export promotion.

During 2005-06, the total area sown under different food crops was 938.53 thousand hectares and during 2012-13, the area under food crops is 992.43 thousand hectares. The maximum area covered under food crops like Maize, Rice and Wheat was 320.92 thousand hectares (34.19 percent), 259.01 thousand hectares (27.60 per cent) and 252.83 thousand hectares (26.93 per cent) of total area sown respectively. The area under fruits and vegetables and pulses was 76.50 and 29.27 thousand hectares which accounted 8.15 and 3.12 per cent of the total area sown. In 2010-11, the area under Maize was 308 thousand hectares (31.56), thus there is decrease in the area under Maize. The area under Rice and Wheat was 261.35 (26.76 per cent) and 290.72 (29.77 per cent) thousand hectares respectively. The area under fruits and vegetables was 87.19 thousand hectares which constitutes 8.90 per cent. Table shows that the area under maize suddenly decreased in 2010-11. In 2012-13, the area under Maize was 310 thousand hectares (31.32) per cent). The area under Rice and Wheat was 261.66 (26.36 per cent) and 292.38 (29.46 per cent) thousand hectares respectively. The area under fruits and vegetables was 100.7 thousand hectares which constitutes 10.14 per cent. Thus, it is clear that the area under fruits and vegetables increased while the area under other food crops Rice, Maize and Wheat has been fluctuated over the study period.

There was significant change in the cropping pattern over years. Cropping pattern is determined mainly by natural factors like rainfall, climate and soil conditions. Technological factors have also played an important part. Cropping pattern has undergone significant changes during the period of planning (particularly during the last three and a half decades). It has been shown in the table that the area under fruits and vegetables increased over the years but it is strange that the area under Maize, Rice and Wheat is fluctuated showing that the main crops of the state lost their demand over years. The growth rate of Maize, Pulses, Rice is low. Pulses and Maize has negative growth. While fruits and vegetables have high growth rate in the state. Fruits and vegetables show a steady improvement in their area, while others show mostly a declining trend. The climate of the state is favorable for the production of wheat, oil seeds, fruits and vegetables and other cash crops.

Variable	Intercept	X ₁	R ²	P value	G.R	
Rice	7280.43	-6.9726	0.013	0.28654	1.023	
Wheat	7256.57	-9.6648	0.042	0.21649	15.64	
Maize	5084.53	-0.0723	7.4E-07	0.6521	- 3.11	
Pulses	42.8833	3.66924	0.11	0.73963	-8.5	
Fruits &	- 425.11	24.8878	0.36	0.73531	31.634	
vegetables						

Table. 1.1 : Regression Table Summary

From the Table 1.1, it is clear that the cropping pattern is determined mainly by natural factors like rainfall, climate and soil conditions as the production does not have any positive relationship with area under different crops. The above regression table shows that both R2 and P value are insignificant, as R2 value should be near to 100 and P value should be less than 10 percent. Both the values are insignificant. Thus we reject our null hypothesis as there is not positive relationship between area and production of these selected crops.

Economic factors play a stronger role influencing the crop pattern in areas with better irrigation and infra-structure potential. Price related factors covering output and input prices as well as trade policies and other economic policies influences the cropping pattern of area. In addition to this, the climate change is a very big issue at the moment in the whole world. Lot of changes have taken place in the climate of the state also. The uncertain weather, especially the erratic rainfall is the main cause. It is affecting us badly. The pesticides that are used in the agricultural field are illegal. Even the fertilizers used are illegal and directly affecting our fields. There are no industries here, but the industries located close to our state are also affecting us. With the improvement of Technology farmers have now gone to grow fruits and vegetables in a big way. In fact, the region of Kashmir is world famous for its fruits and vegetables, depending on agro-climatic suitability, off season vegetables and high quality seeds also being grown in specific clusters. The increase in the area under fruits and vegetables was due to the effect that at the national level the government initiated a series of measures during 1980"s and Market Opportunity.(Bazaz & Haq.2013).

One of the case study has been cited here in order to show the changes in the cropping pattern and increase in the demand of fruits and vegetables in Jammu and Kashmir.

Case Study: Bugam Batpora, a small hamlet in the central Budgam district has emerged as one of the largest producing village in Kashmir valley by producing high quality vegetables worth crores annually.

The village is known as "Chota Punjab" in the Budgam as it supplies vegetables not only to other districts of Jammu and Kashmir but also exports a good quantity to several North Indian states including Delhi, Haryana and U.P. According to villagers, people in the village shifted to vegetable farming around two decades back. "With sustained efforts the production over the years has increased considerably, as a result of which the per capita income of the people associated with vegetable farming has shown sharp improvement". Around 800 hectares of Land in the village is under cultivation of vegetables including cauliflower, reddish, turnip, onion, potato, carrot, Knolkhol and tomato. The Bugam land is dry and that is why the vegetables of this area are tastier. Vegetable cultivation has helped in employment generation.

S.NO	Food Crops	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011- 12	2012-13	G.R
1	Maize	320.92 (34.19)	323.60 (33.87)	302.44 (31.422)	315.81 (32.57)	311.02 (31.75)	308.22 (31.56)	314.03 (31.58)	310.91 (31.32)	-3.11
2	Rice	259.01 (27.60)	252.52 (26.43)	263.25 (27.35)	257.63 (26.57)	259.89 (26.54)	261.35 (26.76)	262.17 (26.37)	261.66 (26.36)	1.023
3	Wheat	252.83 (26.93)	266.11 (27.85)	278.30 (28.91)	278.72 (28.74)	288.94 (29.50)	290.72 (29.77)	296.17 (29.79)	292.38 (29.46)	15.64
4	Fruits and Vegetables	76.50 (8.15)	83.95 (8.78)	88.37 (9.18)	87.42 (9.01)	89.32 (9.11)	87.19 (8.90)	94.30 (9.48)	100.7 (10.14)	31.634
5	Pulses	29.27 (3.12)	29.06 (3.04)	30.15 (3.13)	30.00 (3.09)	30.30 (3.09)	28.91 (2.96)	27.44 (2.76)	26.78 (2.74)	-8.5
Total a	rea sown	938.53	955.24	962.51	969.58	979.47	976.39	994.11	992.43	

 Table 1.2 : Total Area Sown Under Different Food Crops Area (000' hectares)

Source: Digest of Statistics, Directorate of Economics & Statistics, J&K Govt., 2012-13.

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Production of Food-Grains					Quanti	ty Produced				
	S.N	Food Crops	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13
	1	Maize	4535	4869	4745	6331	4870	5277	4745	5123
ſ	2	Rice	5574	5546	5620	5637	5011	5447	5447	5456
ſ	3	Wheat	4575	4983	4959	4835	2899	4463	5003	4646
ſ	4	Fruits*	1403.23	1504.01	1636.3	1690.99	1712.44	2221.98	2161.04	1883.50
	5	Pulses	135	141	153	139	172	169	141	144

Source: Digest of Statistics 2012-13, Directorate of Economics & Statistics, J&K Govt., *Directorate Of Horticulture(P & M), Jammu and Kashmir.

VII. Conclusion and Suggestion

Diversification is an integral part of the process of structural transformation of an economy and the economy of Jammu and Kashmir is no exception. Cropping pattern should aim at making the best use of the available land and outputs, self sufficiency in food grains as a result of higher output per unit of land and per worker should certainly be welcomed and worked for but there is no necessary merit in achieving it by raising food grains on an area which could generate higher incomes by raising fruit, mulberry, or any other cash crop. The area under fruits and vegetables increased at the cost of other food crops which showed a decreasing trend during the study period. Within crop groups, there is an increase in the area under Wheat, whereas area under Rice and Maize has been fluctuated. Due to an increase and a favorable price policy has resulted in an increase in area under wheat and fruits and vegetables. Even though with the introduction of cropping pattern in the state, production of food grains have tremendously increased.

The real difficulty in adopting a better cropping pattern is that farmers may not have adequate amount of capital to invest and therefore the farmers should know the new techniques. Government should come forward to help this. The state farmers should appreciate the importance of fruits and vegetables to improve the productivity of land, generate employment and improve their economic conditions. Initiatives are needed for the agricultural diversification, as diversification taken place in the Kashmir valley have shown a positive trend in terms of return. There should be the diversification, a proper balance between the propagation of cereal and non-cereal crops and the mechanization of agriculture. We have to learn how to use water, we have to get better technologies whether from the domestic system or from anywhere else in the world, then we have to get better price and structure and good remuneration. We have to advice farmers which crop have is to shift from subsistence farming to commercial farming and Cash Crops viz fruits, vegetables. saffron etc besides promoting our traditional and unique crops like Kamand, Zagtumul, Kashmiri Chilli etc.

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