

“An Economic Analysis of Cropping Pattern in the state of Jammu and Kashmir from 2000-01 to 2016-17”

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Abstract

In the state of Jammu and Kashmir, agriculture is the key sector for employment and income generation, because large scale industrialization is not ecologically desirable, and the infrastructure is too poor to attract industries. Jammu and Kashmir is essentially a mountainous state in which only about 30 per cent of the reported area is under cultivation. The cropping pattern usually changes over time with the development of agriculture. In this paper an attempt has been made to examine the direction of cropping pattern, annual growth rate of major crops and percentage share of major crops to gross sown area in the state of Jammu and Kashmir from 2000-01 to 2016-17. It is found from the study that the fruits and vegetables have displayed the highest growth of 96.36 percent among individual crops during the year 2016-17 over 2000-01. The area under fruits and vegetables in the state has increased remarkably from 67.26 thousand hectares in 2000-01 to 132.07 thousand hectares during the year 2016-17 with average of 89.89 thousand hectares between 2000-01 and 2016-17. From table 3.2, it becomes clear that the area fruits and vegetables rice has displayed remarkable average annual growth rate of 4.47 percent between 2000-01 and 2016-17. From table 3.3, it becomes clear that the percentage share of fruits and vegetables to gross sown area has increased from 6.03 percent in 2000-01 to 11.22 percent in 2016-17, which means there have been increase of 5.19 percentage points in its share with average percentage share of 7.89 percent over the study period of 17 years.

Keywords: Agriculture Sector, Area, Cropping Pattern, Jammu and Kashmir, Fruits and Vegetables,

1: Introduction

India is predominantly an agrarian country with nearly 70 per cent of its population living in rural areas, nearly 60 percent of workforce being dependent directly and indirectly on agriculture and allied activities as the main occupation and a big proportion of rural households earning their subsistence from agriculture. In the state of Jammu and Kashmir, agriculture is the key sector for employment and income generation, because large scale industrialization is not ecologically desirable, and the infrastructure is too poor to attract industries. Jammu and Kashmir is essentially a mountainous state in which only about 30 per cent of the reported area is under cultivation (**Anonymous, 2011-12**). The average land holding in the state is (0.67 ha) and majority of the farmers (78 per cent) in the state are marginal having less than 1ha land holding. Paddy and fruits are the main crops of Kashmir, followed by maize, oilseeds, pulses, vegetables, fodders and wheat. In Jammu region wheat is the predominant crop followed by maize, paddy, pulses, oilseeds, fodder, vegetables and other crops while in Ladakh, barley is the major cereal crop followed by wheat. State has also the honor amongst the world's few places where saffron is cultivated.

Cropping pattern is defined as a combination of agricultural crops that are grown in a particular geographical area. It can be viewed either in terms of the area allocated for each crop, or, by the production composition in value terms for any specific area (**Vyas, 1996**). It is determined mainly by physical, socio-cultural and historic factors. Besides technological factors have also played an important role (**Misra & Puri, 2011**). It is important to note that the adoption of a scientific cropping pattern best suited to the technological changes and that maximizes the net value of agricultural production is extremely essential (**Murthyunjaya and Kumar, 1989**). The cropping pattern usually changes over time with the development of agriculture, as is evident in the case of agriculture in India. This type of change is largely characterized by an increasing trend towards commercial crops over the years (**Nadkarni and Vedini, 1996**). The cropping pattern in a particular region is subject to changes depending on a large number of factors like climate, rainfall, agricultural technology, availability of irrigation facilities, relative price and profitability of various crops, and so on (**Misri and Bhat ;1994**).

II: Research Objectives

In the light of importance of the present study entitled “*An Economic Analysis of Cropping Pattern in the state of Jammu and Kashmir from 2000-01 to 2016-17*” researcher has set the following objectives:

- To explore the direction of cropping pattern in the state of Jammu and Kashmir from 2000-01 to 2016-17
- To examine the annual growth rate of major crops in the state of Jammu and Kashmir from 2000-01 to 2016-17
- To analyse the percentage share of major crops to gross sown area from 2000-01 to 2016-

III: Research Methodology

The study is purely based on secondary data. The secondary data have been collected as per the requirements of the study from various official sources like Ministry of Agriculture, Horticulture Statistics Division, Department of Agriculture, Cooperation and Farmers Welfare (Government of India), Central Statistics Office, Ministry of Statistics and Programme Implementation (Government of India), Department of Economic Affairs, Economic Division (Government of India), Economic survey, Directorate of Economics and Statistics ,J&K, Directorate of Agriculture, J&K, Directorate of horticulture, J&K. Further various published research papers, books, periodicals, reports, magazines, newspapers, and websites have also been used for the study. Further various published research papers, books, periodicals, reports, magazines, newspapers, and websites have also been used for the study.

IV. Statistical Analysis

Collected information was analyzed with the help of Excel. The statistical techniques used in this study are Average, Growth Rate and Percentage.

V. Data Analysis and Interpretation

The state of Jammu and Kashmir has a good potential for changes in the cropping pattern. In response to this potential and the changing market conditions, farmers have been changing their cropping pattern. A study on the nature of changes in the cropping pattern, whether they lead to crop diversification or crop concentration, in a detailed and analytical way will be useful for designing the policy for agricultural diversification. The cropping pattern in the state of J&K from 2000-01 to 2016-17 is presented in below table.

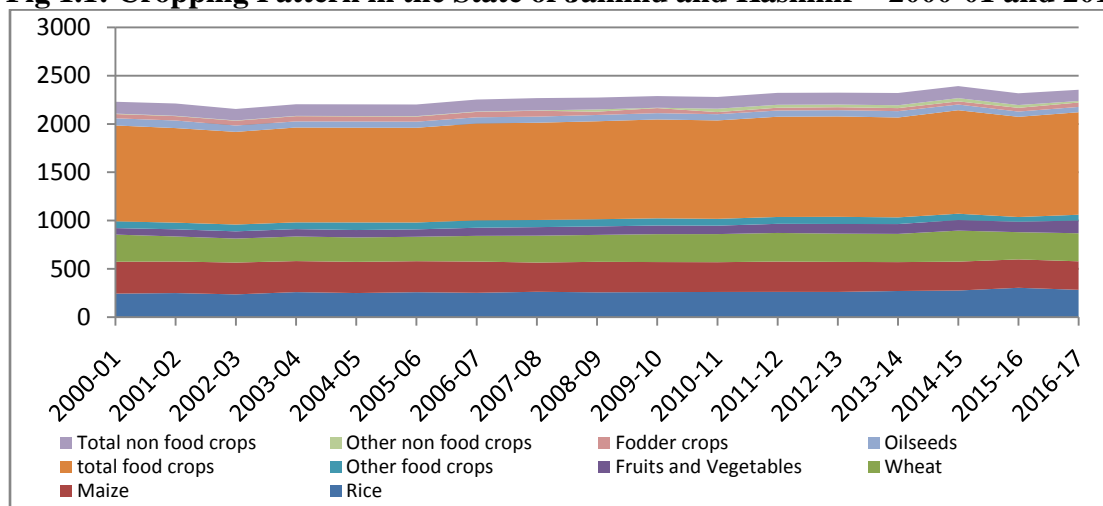
Table 1.1: Cropping Pattern in the State of Jammu and Kashmir – 2000-01 and 2016-17

(Area in 000, hectares)

Year	Rice	Maize	Wheat	Fruits & Vegetables	Other Food Crops	Total Food Crops	Oilseeds	Fodder Crops	Other Non Food Crops	Total Non Food Crops	Gross Area Sown
2000-01	244.05	330.21	280.96	67.26	69.97	992.45	73.91	43.86	4.76	122.53	1114.99
2001-02	249.80	326.48	259.60	73.78	69.16	978.82	78.31	45.45	3.46	127.22	1106.04
2002-03	236.20	329.46	248.30	74.98	70.2	959.14	66.12	48.91	3.54	118.57	1077.71
2003-04	259.82	321.19	254.66	76.30	69.85	981.82	63.08	54.09	3.15	120.32	1102.14
2004-05	250.04	322.70	252.78	76.86	78.53	980.91	64.49	52.41	3.82	120.72	1101.64
2005-06	259.01	320.92	252.83	76.50	71.31	980.57	63.01	52.91	4.44	120.36	1100.93
2006-07	252.52	323.60	266.11	83.95	76.34	1002.52	64.30	55.36	4.23	123.89	1126.41
2007-08	263.25	302.44	278.30	88.37	74.09	1006.45	63.27	60.73	3.49	127.49	1133.94
2008-09	257.63	315.81	278.72	87.42	74.45	1014.03	65.24	34.22	23.3	122.76	1136.73
2009-10	259.89	311.02	288.94	89.32	74.28	1023.45	65.26	52.44	3.42	121.12	1144.57
2010-11	261.35	308.22	290.72	87.19	70.88	1018.36	64.56	21.76	35.15	121.47	1139.81
2011-12	262.17	314.03	296.17	94.30	70.83	1037.50	64.53	28.86	30.23	123.62	1161.11
2012-13	261.66	310.91	292.38	100.07	74.17	1039.19	64.91	30.44	27.56	122.91	1162.09
2013-14	271.49	298.68	292.07	101.99	69.29	1033.52	65.73	31.51	29.55	126.79	1160.31
2014-15	276.42	298.87	320.97	109.66	65.3	1071.22	59.19	32.59	33.14	124.92	1196.14
2015-16	304.50	293.86	281.87	108.11	48.76	1037.10	54.52	38.33	28.97	121.82	1158.92
2016-17	283.44	295.17	290.30	132.07	59.8	1060.78	54.71	45.87	15.71	116.29	1177.07
Average	261.96	313.15	277.98	89.89	69.84	1012.81	64.42	42.93	15.17	122.52	1135.33
Growth	16.14	-10.61	3.32	96.36	-14.53	6.88	-25.98	4.58	230.04	-5.09	5.57

Source: Financial Commissioner, Revenue- Jammu and Kashmir, Srinagar

Fig 1.1: Cropping Pattern in the State of Jammu and Kashmir – 2000-01 and 2016-17



Source: Based on table 1.1

The cropping pattern in the state of Jammu and Kashmir from 2000-01 to 2016-17 is presented in table 1.1. It is evident from the table that the gross sown area in the state has increased from 1114.99 thousand hectares in 2000-01 to 1177.07 thousand hectares during the year 2016-17 with average of 1135.33 thousand hectares and displayed remarkable growth of 5.57 percent over the study period of 17 years.

Further, it is clearly found from the table that the area under rice in the state has increased from 244.05 thousand hectares in 2000-01 to 283.44 thousand hectares during the year 2016-17 with average of 261.96 thousand hectares and displayed remarkable growth of 16.14 percent between 2000-01 and 2016-17. The area under maize in the state has decreased from 330.21 thousand hectares in 2000-01 to 295.17 thousand hectares during the year 2016-17 with average of 313.15 thousand hectares and displayed negative growth of -10.61 percent over the study period of 17 years. The area under wheat in the state has increased from 280.96 thousand hectares in 2000-01 to 290.30 thousand hectares during the year 2016-17 with average of 277.98 thousand hectares and displayed marginal growth of 3.32 percent between 2000-01 and 2016-17.

Fruits and vegetables have displayed the highest growth of 96.36 percent among individual crops during the year 2016-17 over 2000-01. The area under fruits and vegetables in the state has increased remarkably from 67.26 thousand hectares in 2000-01 to 132.07 thousand hectares during the year 2016-17 with average of 89.89 thousand hectares between 2000-01 and

2016-17. The area under other food crops in the state has decreased from 69.97 thousand hectares in 2000-01 to 59.8 thousand hectares during the year 2016-17 with average of 69.84 thousand hectares and displayed negative growth of -14.53 percent over the study period of 17 years. The area under total food crops in the state has increased from 992.45 thousand hectares in 2000-01 to 1060.78 thousand hectares during the year 2016-17 with average of 1012.81 thousand hectares and displayed growth of 6.88 percent between 2000-01 and 2016-17.

Furthermore, it is obvious from the table that the area under oilseeds in the state has decreased immensely from 73.91 thousand hectares in 2000-01 to 54.71 thousand hectares during the year 2016-17 with average of 64.42 thousand hectares and displayed negative growth of -25.98 percent, the lowest observed growth rate among the individual crops over the study period of 17 years. The area under total fodder crops in the state has increased marginally from 43.86 thousand hectares in 2000-01 to 45.87 thousand hectares during the year 2016-17 with average of 42.93 thousand hectares and displayed growth of 4.58 percent between 2000-01 and 2016-17. The area under other nonfood crops in the state has increased from 4.76 thousand hectares in 2000-01 to 15.71 thousand hectares during the year 2016-17 with average of 15.17 thousand hectares and displayed growth of 230.04 percent over the study period of 17 years. Similarly, it is clearly found from the table that the area under total nonfood crops in the state has decreased from 122.53 thousand hectares in 2000-01 to 116.29 thousand hectares during the year 2016-17 with average of 122.52 thousand hectares and displayed growth of -5.09 percent over the study period of 17

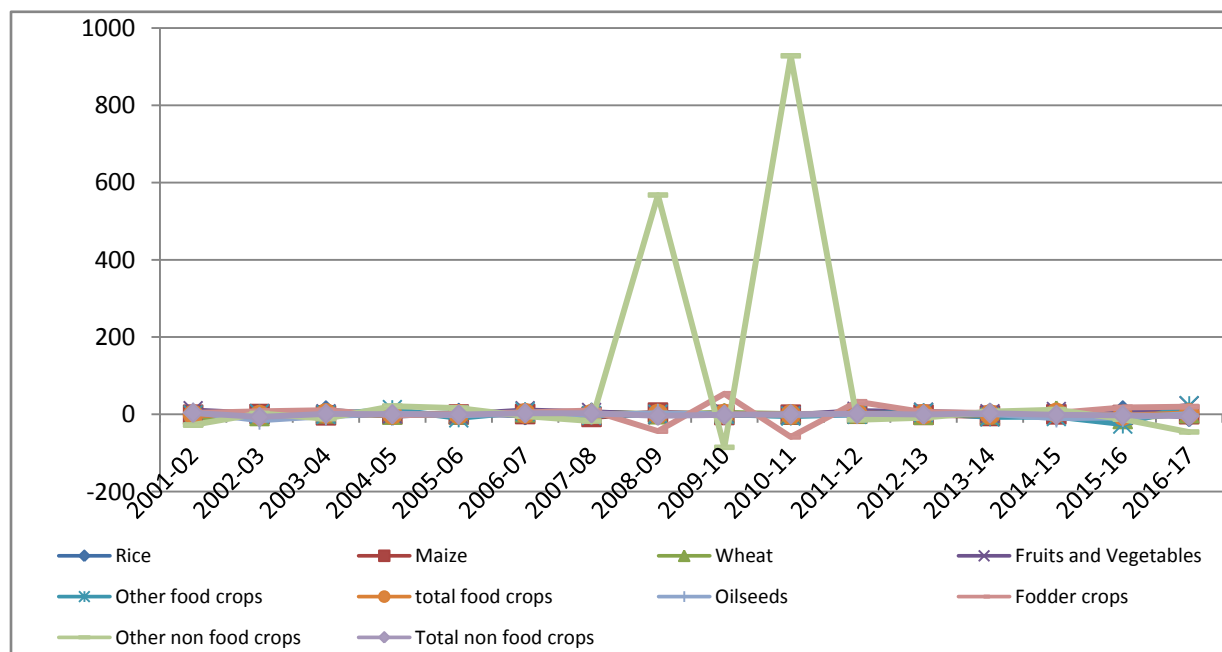
Hence, it is inferred from the above table that the area under maize, other food crops, oilseeds and total nonfood crops has decreased over the study period and the area under rice, wheat, fruits and vegetables, fodder crops and other nonfood crops has increased over the study period. The highest growth 96.36 percent of was observed in case of fruits and vegetables while as lowest growth of -25.98 was observed in case of oilseeds, which means the area under fruits and vegetables is increasing at faster pace with changes in cropping pattern.

Table 1.2: Annual Growth Rate of major crops in the State of Jammu and Kashmir – 2000-01 and 2016-17

Year	Rice	Maize	Wheat	Fruits & Vegetables	Other Food Crops	Total Food Crops	Oilseeds	Fodder Crops	Other Non Food Crops	Total Non Food Crops	Gross Area Sown
2000-01	-	-	-	-	-	-	-	-	-	-	-
2001-02	2.36	-1.13	-7.60	9.69	-1.16	-1.37	5.95	3.63	-27.31	3.83	-0.80
2002-03	-5.44	0.91	-4.35	1.63	1.50	-2.01	-15.57	7.61	2.31	-6.80	-2.56
2003-04	10.00	-2.51	2.56	1.76	-0.50	2.36	-4.60	10.59	-11.02	1.48	2.27
2004-05	-3.76	0.47	-0.74	0.73	12.43	-0.09	2.24	-3.11	21.27	0.33	-0.05
2005-06	3.59	-0.55	0.02	-0.47	-9.19	-0.03	-2.29	0.95	16.23	-0.30	-0.06
2006-07	-2.51	0.84	5.25	9.74	7.05	2.24	2.05	4.63	-4.73	2.93	2.31
2007-08	4.25	-6.54	4.58	5.27	-2.95	0.39	-1.60	9.70	-17.49	2.91	0.67
2008-09	-2.13	4.42	0.15	-1.08	0.49	0.75	3.11	-43.65	567.62	-3.71	0.25
2009-10	0.88	-1.52	3.67	2.17	-0.23	0.93	0.03	53.24	-85.32	-1.34	0.69
2010-11	0.56	-0.90	0.62	-2.38	-4.58	-0.50	-1.07	-58.50	927.78	0.29	-0.42
2011-12	0.31	1.89	1.87	8.15	-0.07	1.88	-0.05	32.63	-14.00	1.77	1.87
2012-13	-0.19	-0.99	-1.28	6.12	4.72	0.16	0.59	5.47	-8.83	-0.57	0.08
2013-14	3.76	-3.93	-0.11	1.92	-6.58	-0.55	1.26	3.52	7.22	3.16	-0.15
2014-15	1.82	0.06	9.89	7.52	-5.76	3.65	-9.95	3.43	12.15	-1.47	3.09
2015-16	10.16	-1.68	-12.18	-1.41	-25.33	-3.19	-7.89	17.61	-12.58	-2.48	-3.11
2016-17	-6.92	0.45	2.99	22.16	22.64	2.28	0.35	19.67	-45.77	-4.54	1.57
Average	1.04	-0.67	0.33	4.47	-0.47	0.43	-1.71	4.21	82.97	-0.28	0.35

Source: Computed by Researcher from table 1.1 Source: Based on table 1.2

The year on year growth rate of major crops and gross area sown in the state of Jammu



and Kashmir between 2000-01 and 2016-17 is presented in table 1.2. It is obvious from the table that in case of gross area sown, the highest growth rate of 3.09 was observed in 2014-15 and lowest growth rate of -3.11 was observed during the year 2015-16 with average annual growth rate of 0.35 percent.

The table further depicts that in case of rice, the highest growth rate of 10.16 was observed in 2015-16 and lowest growth rate of -6.92 was observed during the year 2016-17 with average annual growth rate of 1.04 percent. In case of maize, the highest growth rate of 4.42 was observed in 2008-09 and lowest growth rate of -6.54 was observed during the year 2007-08 with average annual growth rate of -0.67 percent. In case of wheat, the highest growth rate of 9.89 was observed in 2014-15 and lowest growth rate of -12.18 was observed during the year 2015-16 with average annual growth rate of 0.33 percent.

In case of fruits and vegetables, the highest growth rate of 22.16 was observed in 2016-17 and lowest growth rate of -1.41 was observed during the year 2015-16 with average annual growth rate of 4.47 percent. In case of other food crops, the highest growth rate of 22.64 was observed in 2016-17 and lowest growth rate of -25.33 was observed during the year 2015-16 with average annual growth rate of -0.47 percent. In case of total food crops, the highest growth rate of 3.65 was observed in 2014-15 and lowest growth rate of -3.19 was observed during the year 2015-16 with average annual growth rate of 0.43 percent.

Furthermore, it is apparent from table 1.2 that in case of oilseeds, the highest growth rate of 5.95 was observed in 2001-02 and lowest growth rate of -15.57 was observed during the year 2002-03 with average annual growth rate of -1.71 percent. In case of fodder crops, the highest growth rate of 53.24 was observed in 2009-10 and lowest growth rate of -43.65 was observed during the year 2008-09 with average annual growth rate of 4.21 percent. In case of other non food crops, the highest growth rate of 927.78 was observed in 2010-11 and lowest growth rate of -85.32 was observed during the year 2009-10 with average annual growth rate of 82.97 percent. In case of total non food crops, the highest growth rate of 3.83 was observed in 2001-02 and lowest growth rate of -6.80 was observed during the year 2002-03 with average annual growth rate of -0.28 percent.

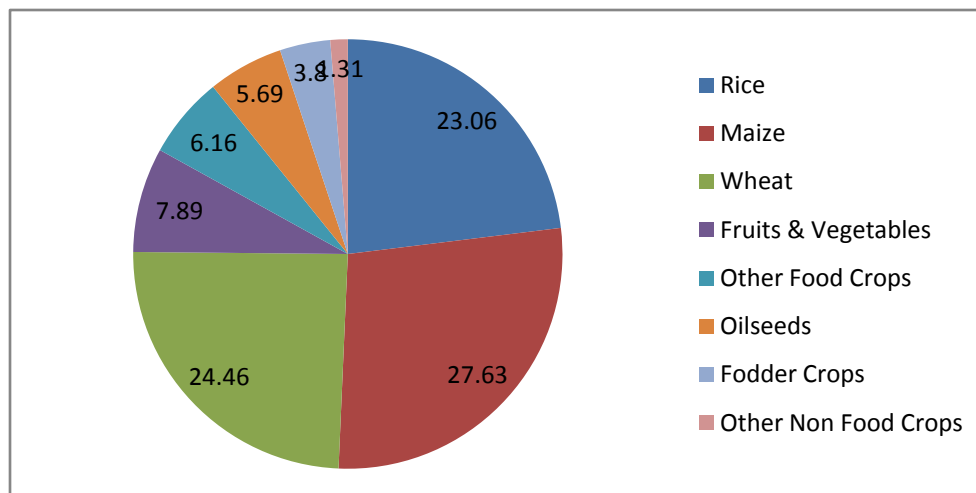
Table 1.3: Percentage Share of Major Crops to Gross Sown Area (2000-01 to 2016-17)

Year	Rice	Maize	Wheat	Fruits & Vegetables	Other Food Crops	Total Food Crops	Oilseeds	Fodder Crops	Other Non Food Crops	Total Non Food Crops	Gross Area Sown
2000-01	21.89	29.62	25.20	6.03	6.28	89.01	6.63	3.93	0.43	10.99	100.00
2001-02	22.59	29.52	23.47	6.67	6.25	88.50	7.08	4.11	0.31	11.50	100.00
2002-03	21.92	30.57	23.04	6.96	6.51	89.00	6.14	4.54	0.33	11.00	100.00
2003-04	23.57	29.14	23.11	6.92	6.34	89.08	5.72	4.91	0.29	10.92	100.00
2004-05	22.70	29.29	22.95	6.98	7.13	89.04	5.85	4.76	0.35	10.96	100.00
2005-06	23.53	29.15	22.97	6.95	6.48	89.07	5.72	4.81	0.40	10.93	100.00
2006-07	22.42	28.73	23.62	7.45	6.78	89.00	5.71	4.91	0.38	11.00	100.00
2007-08	23.22	26.67	24.54	7.79	6.53	88.76	5.58	5.36	0.31	11.24	100.00
2008-09	22.66	27.78	24.52	7.69	6.55	89.21	5.74	3.01	2.05	10.80	100.01
2009-10	22.71	27.17	25.24	7.80	6.49	89.42	5.70	4.58	0.30	10.58	100.00
2010-11	22.93	27.04	25.51	7.65	6.22	89.34	5.66	1.91	3.08	10.66	100.00
2011-12	22.58	27.05	25.51	8.12	6.10	89.35	5.56	2.49	2.60	10.65	100.00
2012-13	22.52	26.75	25.16	8.61	6.38	89.42	5.59	2.62	2.37	10.58	100.00
2013-14	23.40	25.74	25.17	8.79	5.97	89.07	5.66	2.72	2.55	10.93	100.00
2014-15	23.11	24.99	26.83	9.17	5.46	89.56	4.95	2.72	2.77	10.44	100.00
2015-16	26.27	25.36	24.32	9.33	4.21	89.49	4.70	3.31	2.50	10.51	100.00
2016-17	24.08	25.08	24.66	11.22	5.08	90.12	4.65	3.90	1.33	9.88	100.00
Average	23.06	27.63	24.46	7.89	6.16	89.20	5.69	3.80	1.31	10.80	100.00

Source: Computed by Researcher from table 1.1

Figure 1.3: Average Percentage Share of Major Crops to Gross Sown Area (2000-01 to 2016-17)

Source: Based on table 3.3



The year wise percentage share of major crops to gross sown area from 2000-01 to 2016-17 in the state of Jammu and Kashmir is

presented in table 1.3. It is clearly found from the table that the percentage share of rice to gross sown area has increased from 21.89 percent in 2000-01 to 24.08 percent in 2016-17, which means there have been increase of 2.19 percentage points in it share with average percentage share of 23.06 percent over the study period of 17 years. The percentage share of maize to gross sown area has decreased from 29.62 percent in 2000-01 to 25.08 percent in 2016-17, which means there have been decrease of 4.54 percentage points in it share with average percentage share of 27.63 percent between 2000-01 and 2016-17. The percentage share of wheat to gross sown area has decreased from 25.20 percent in 2000-01 to 24.66 percent in 2016-17, which means there have been decrease of 0.54 percentage points in it share with average percentage share of 24.46 percent over the study period of 17 years.

The table further depicts that the percentage share of fruits and vegetables to gross sown area has increased from 6.03 percent in 2000-01 to 11.22 percent in 2016-17, which means there have been increase of 5.19 percentage points in it share with average percentage share of 7.89 percent over the study period of 17 years. The percentage share of other food crops to gross sown area has decreased from 6.28 percent in 2000-01 to 5.08 percent in 2016-17, which means there have been decrease of 1.2 percentage points in it share with average percentage share of 6.16 percent over the study period of 17 years.

Furthermore, it is evident from the table that the percentage share of oilseeds to gross sown area has decreased from 6.63 percent in 2000-01 to 4.65 percent in 2016-17, which means there have been increase of 1.98 percentage points in it share with average percentage share of 5.69 percent over the study period of 17 years. The percentage share of fodder crops to gross sown area has decreased from 3.93 percent in 2000-01 to 3.90 percent in 2016-17, which means there have been decrease of 0.03 percentage points in it share with average percentage share of 3.80 percent over the study period of 17 years. The percentage share of other non food crops to gross sown area has increased from 0.43 percent in 2000-01 to 1.33 percent in 2016-17, which means there have been increase of 0.9 percentage points in it share with average percentage share of 1.31 percent over the study period of 17 years.

The table further depicts that the percentage share of total food crops to gross sown area has increased from 89.01 percent in 2000-01 to 90.12 percent in 2016-17, which means there

have been increase of 1.11 percentage points in it share with average percentage share of 89.20 percent over the study period of 17 years. The percentage share of total nonfood crops to gross sown area has decreased from 10.99 percent in 2000-01 to 9.88 percent in 2016-17, which means there have been decrease of 1.11 percentage points in it share with average percentage share of 10.80 percent between 2000-01 and 2016-17.

Hence, it is inferred from the analysis table that the percentage share of rice, fruits and vegetables and other nonfood crops to gross sown area has increased over the study period and the percentage share of maize, wheat, other food crops, oilseeds and fodder crops has decreased over the study period of 17 years i.e. between 2000-01 and 2016-17. But the major beneficiaries in terms of increased percentage share to gross sown area were fruits and vegetables.

VI. Conclusion

As evident from the results, during the study period of 17 years i.e. 2000-01 to 2016-17, the cropping pattern of Jammu and Kashmir underwent drastic changes; substantial changes were observed in the nature and direction of cropping pattern. The state has undergone a major diversification, moved away from traditionally grown food crops towards the high value commodities, mainly fruits and vegetables. It becomes clear that the fruits and vegetables have displayed the highest growth of 96.36 percent among individual crops during the year 2016-17 over 2000-01. The area under fruits and vegetables in the state has increased remarkably from 67.26 thousand hectares in 2000-01 to 132.07 thousand hectares during the year 2016-17 with average of 89.89 thousand hectares between 2000-01 and 2016-17. From table 3.2, it becomes clear that the area fruits and vegetables rice has displayed remarkable average annual growth rate of 4.47 percent between 2000-01 and 2016-17. From table 3.3, it becomes clear that the percentage share of fruits and vegetables to gross sown area has increased from 6.03 percent in 2000-01 to 11.22 percent in 2016-17, which means there have been increase of 5.19 percentage points in it share with average percentage share of 7.89 percent over the study period of 17 years. Hence, it is inferred that the area under fruits and vegetables cultivation has increased in the state between 2000-01 and 2016-17.

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