



Diversification in J and K Agriculture towards High Value Cash Crops

Role of Small Holders

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Abstract:

Agricultural diversification towards high value cash crops can potentially increase farm incomes, especially in a State like Jammu and Kashmir where demand for high value crops especially fruits has been increasing more quickly than that of cereal crops. Jammu and Kashmir agriculture is overwhelming dominated by small holders, and researchers have long debated the ability of smallholders-dominated subsistence farm economy to diversify into high value commercial crops. Here, we present evidence that the gradual diversification of J&K agriculture towards high value cash crops exhibits pro-smallholder bias, with smallholders playing prominently larger role in the cultivation of horticulture crops. The observed patterns are consistent with simple comparative-advantage based production choices. The comparatively high labour endowments of the small farmers, as reflected in their greater family sizes, induce them to diversify towards horticulture crops. Small or medium holders do not appear to allocate a greater share of land to vegetables or fruits. However, the share allocated to fruits significantly higher if the family size is bigger, while the reverse is true in case of vegetables.

Keywords: Diversification, Smallholders, Agriculture, High-value crops.

Introduction:

Although agriculture occupies a shrinking share of J&K's state economy, achieving rapid growth in agriculture remains a major policy concern statewide. The contribution of agriculture to GSDP fell from 23.86% in 2010-11 to 20.59% in 2013-14. However, 75% population of J&K lives in rural areas and three-fourth of

people making up these rural populations depend on agriculture and allied activities for their livelihood. Furthermore the agricultural sector is the main source of employment in the state, comprising 49% of state's labour force in 2013-14.

Area under fruits in J&K state has increased from 23.25 lakh hectares in 2011-12 to 3.55 lakh hectares in 2013-14. The production has increased from 17.42 lakh MT in 2012-13 to 21.17 lakh MT in 2013-14.

Per capita income of Rs 58593 at current prices and Rs 31773 at constant (2004-05) prices was estimated for J&K FOR 2013-14, showing 13.79% and 4.74% increase over the estimate 2012-13 at current and constant prices respectively. The rise or fall in Per Capita Income signals direction of growth in the economy.

The potential to increase growth through staples appears limited, mainly due to stagnant demand for staples. The consumption patterns have diversified towards high value agricultural commodities such as fruits, vegetables, poultry, dairy and processed food. This demand shift is underpinned by sustained income growth and urbanization, and show that the diversification in consumption patterns towards high value agricultural products will become more pronounced with income growth and changes in other determinants such as urbanization.

From the prospective of poverty reduction, diversification is particularly appealing. Most high value commodities are labour-intensive, have low gestation periods and generate quick returns. Hence they offer a perfect opportunity for smallholders to utilize surplus labour and augment their incomes.

However, the transition towards high value agriculture is not without constraints, especially for smallholders. If the high value commodities are products that the farmers have not grown before, the farmers may lack necessary information on production methods, marketing opportunities, and the probable distribution of net returns. This problem is particularly acute when the target consumers have very specific quality requirements and/or strict food safety requirements. Of course the farmers can attempt to gather information, but this often involves fixed cost, thus giving an advantage to large-scale farmers. Larger farmers are often better able to bear the risks associated with producing and marketing of high value commodities.

Furthermore, a small farmer who allocates land to a commercial crop often has to depend on market purchases to meet food requirements, resulting in an additional source of risk. Some high value agricultural commodities also require significant investments including the use of specific inputs. The production and marketing of highly perishable high value crops benefit from the producing farm being located near markets and good marketing infrastructure (Torero and Gulati, 2004).

Farmers in the state like Jammu and Kashmir, particularly poor farmers often do not have the savings or credit access needed to make these investments and purchase the necessary inputs. However, high value crops like fruits may become viable prospects when these constraints are relieved through intervention. Furthermore,

smallholders tend to have greater labour endowments, meaning that they may be better suited in cultivating labour intensive high value crops.

Using state-level information on the percentage of landholdings belonging to smallholders, along with various indicators of diversification in agriculture, we show that diversification away from cereals into fruits is significantly higher in the state with a greater share of smallholders.

Objectives:

- To identify the role of smallholders in diversification towards high-value crops.
- To examine patterns of diversification in Jammu and Kashmir.

Data Base:

The present study is totally based on secondary data sources, collected from “Digest Of Statistics” Directorate of Economics and Statistics, Govt. of Jammu and Kashmir and other published sources like Jammu and Kashmir Economic Survey, Journals, Magazines, Papers and Thesis etc. Mostly data for the present study has been collected from “Digest Of Statistics”, Govt. of Jammu and Kashmir.

Crop Diversification in Jammu and Kashmir.

The process of crop diversification in the state of Jammu and Kashmir towards horticulture crops started with the introduction of several land reforms initiated at time to time by the Govt. of India. The cultivation of such crops has made a noteworthy impact on the generation of household income, employment and revenue for the state. The study of factors which improved the course of crop diversification reveals the explicit consideration of geographical significance in formulating developmental strategies, resulting in the establishment of basic infrastructural services like accessibility to various markets in the neighboring states, high level of price receptiveness among the farmers and the emergence of timely policies by the govt. triggered the process of diversification towards the horticulture crops in the state.

Apple cultivation is the main occupation in the Kashmir valley, contributing to GSDP up to considerable level, still it has not been provided industrial status, owing to ignorance from govt. side, lack of infrastructure and proper marketing channels. During the last several years diversification of agriculture in the state towards high value commodities like fruits, vegetables, spices etc. has been proceeding at a fast pace and is reflected in the high share of HVCs in agricultural production in a number of districts.

Sustained economic and income growth, globalization and urbanization are fuelling rapid

growth in demand for high value commodities in the state. It is expected that by 2025 demand for fruits, vegetables etc. to be double over the current levels. High value agriculture has a comparative advantage in production and labour absorption over staple and therefore is reckoned as an important strategy for small orchard holders. Equally important, the consumption of high value commodities is on rise.

Finally it is expected that by 2025 demand for HVCs including fruits, vegetables, spices etc. would almost double than that of 2000. In order to understand the extent of crop diversification in J&K, a state level and district level analysis of crop diversification is followed. Firstly, the status of land utilization pattern in the state is examined, secondly status of cropping pattern is examined and thirdly index of crop diversification is calculated for different periods during 1990-91 to 2013-14, which are shown in the tables given below.

Table 1.

Land use Pattern in Jammu and Kashmir in Different Years (1990-91 to 2013-14)

S No	Classification of Area	1990-91 %	2000-01 %	2009-10 %	2013-14 %
1	Total Geographical area (as per village paper.	100	100	100	100
2	Area covered by forest.	27.23	27.23	27.23	27.23
3	Land put to non-agriculture uses	12.04	12.04	12.25	10.43
4	Permanent pastures and other grazing land.	5.25	5.21	4.96	4.71
5	Barren and cultivable land	12.21	12.04	11.34	12.66
6	Land under miscellaneous uses	3.02	2.98	2.64	2.69
7	Cultivable waste land	5.67	5.79	6.16	5.54
8	Fallow land other than current fallow	0.24	0.33	1.07	0.66
9	Current fallow	4.01	3.39	3.47	4.71
10	Net sown area	30.25	30.96	30.42	30.67
11	Area sown more than once	13.90	15.19	16.92	17.34
12	Total cropped area	44.16	46.15	47.35	48.01

Source: Digest of Statistics and Financial Commissioner Revenue, Govt. of J&K.

Area in '000' hectares, Percentage to total geographical area (As per village paper)

Table shows land use classification at four periods of time viz. 1990-91, 2000-01, 2010-11 and 2013-14. According to the classification of area in the table cited above, Jammu and Kashmir has 27.23 per cent of its total area under forest that has remained unchanged over the entire period. The land put to non-agricultural uses remained unchanged as 12.04 per cent of its total area in 2000-01. This figure rises from 12.04 per cent in 2000-01 to 12.25 per cent in 200-11, while it decreased to 0.43 per cent in 2013-14.

Permanent pastures and other grazing land decreased from 5.25 per cent of its total area in 1990-91 to 5.21 per cent in 2000-01. It further declined to 4.96 per cent in 2010-11 and 4.71 per cent in 2013-14. Barren and cultivable land declined from 12.21 per cent in 1990-91 to 12.04 per cent in 2000-01. This figure further declined to 11.34 per cent in 2010-11. During 2013-14 this figure has increased to 12.66 per cent of its total area.

Land under miscellaneous uses also experienced a reduction in area. It has come down from 3.02 per cent in 1990-91 to 2.69 per cent in 2013-14. Cultivable waste land increased from 5.67 per cent of its total area in 1990-91 to 5.79 per cent in 2000-01 and 6.16 per cent in 2010-11. This figure has come down to 5.54 per cent in 2013-14. Area under fallow land other than current fallow has increased from 0.24 per cent in 1990-91 to 0.33 per cent in 2000-01. It has further gone up to 1.07 per cent in 2010-11. But this figure has declined to 0.66 per cent in 2013-14.

Current fallow land has shown fluctuating trends. This category has registered a decline from 4.01 per cent in 1990-91 to 3.39 per cent in 2000-01. The figure has increased to 3.47 per cent in 2010-11 and 4.71 per cent in 2013-14.

Net sown area has shown fluctuations over the entire period. This class of area has increased from 30.25 per cent of its total area in 1990-91 to 30.96 per cent in 2000-01. This figure declined to 30.42 per cent in 2010-11, while it has again gone up to 30.67 per cent in 2013-14.

Area sown more than once has shown increasing trends. This category has increased from 13.90 per cent in 1990-91 to 15.19 per cent in 2000-01. It has further gone up to 16.92 per cent in 2010-11 and 17.34 per cent in 2013-14.

Total cropped area represents the net area sown and area sown more than once during the same period. Total cropped area has increased from 44.16 per cent in 1990-91 to 46.15 per cent in 2000-01, which has further gone up to 47.35 per cent in 2000-11 and 48.01 per cent in 2013-14.

Fig:1

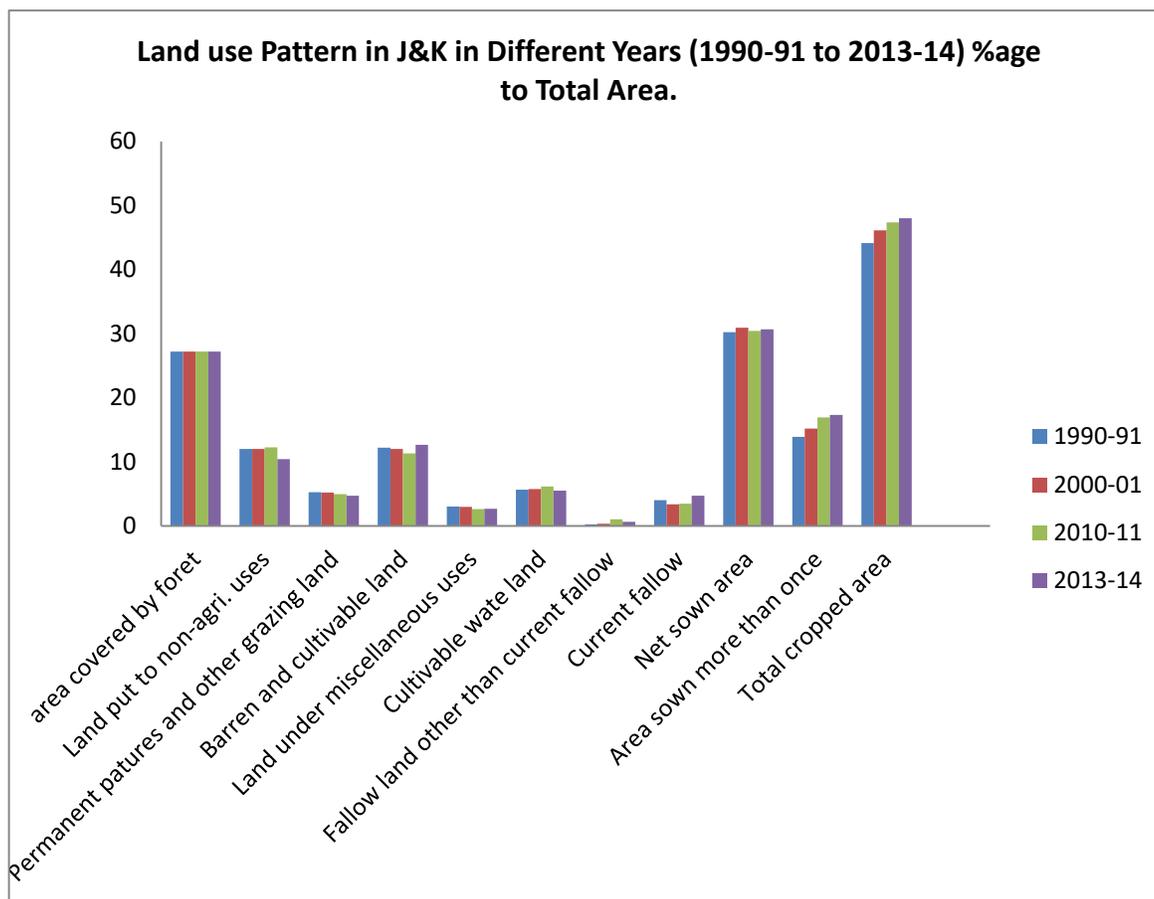


Table.2

Variations in the Land use Pattern in Jammu and Kashmir during 1990-91 to 2013-4.

(In Percentages)

S No	Classification of Area	2000-01 over 1990-91	2010-11 over 2000-01	2013-14 over 200-11
1	Area covered by forest.	0.00	0.00	0.00
2	Land put to non-agriculture uses	0.00	0.2	-1.82
3	Permanent pastures and other grazing land.	-0.04	-0.25	-0.25
4	Barren and cultivable land	-0.17	-0.7	1.32
5	Land under miscellaneous uses	-0.04	-0.34	0.05
6	Cultivable waste land	0.12	0.37	-0.62

7	Fallow land other than current fallow	0.09	0.74	-0.41
8	Current fallow	-0.62	0.08	1.24
9	Net sown area	0.71	-0.54	0.25
10	Area sown more than once	1.29	1.73	0.42
11	Total cropped area	1.99	1.2	0.66

Source: Digest of Statistics, Govt. of J&K, 2013-14.

It is observed from the table that there have been fluctuations in almost all categories of land during the entire period. Area under current fallows has shown rapid increase and highest current fallow area 1.24 per cent was recorded in 2013-4. Total cropped area has shown steady decline over the entire period due to decline in net sown area and area own more than once. Area not available for cultivation has shown more or less decline during entire period.

Table.3

Cropping Pattern in Jammu and Kashmir in Different Years (1990-91 to 2013-14)

(Percentage to Total Cropped area).

Crops	1990-91 %	2000-01 %	2010-11 %	2013-14 %
Cereal crops				
Rice	25.38	21.30	21.03	21.55
Maize	27.29	28.82	24.80	23.71
Wheat	22.69	24.52	23.39	23.19
Bajra	1.48	1.16	1.34	1.11
Barley	0.75	0.77	1.07	0.99
Total Cereals	77.64	76.60	71.65	70.57
Pulses	3.82	2.39	2.32	2.04
Oilseeds	6.25	6.45	5.19	5.21
Fruits				
Apple	6.31	7.11	11.40	12.77
Walnut	3.78	5.22	7.22	7.59
Almond	1.77	1.57	1.41	1.26
Apricot	NA	0.35	0.47	0.51

Total fruits	11.87	14.27	20.51	22.14
Saffron	0.49	0.26	0.30	-

Source: Digest of Statistics, Govt. of J&K, 2013-14.

It is depicted in the table cited above that during 1990-91 the order of the first five crops was Maize, Rice, Wheat, Apple and Oilseeds in descending order of share to the total cropped area. Table 4.4.3 shows that during 2000-01 the first five crops were Maize, Wheat, Rice, Apple and Oilseeds. Wheat came to second position by pushing Rice to the third. During 2010-11 the first five crops were Maize, Wheat, Rice, Apple and Walnut. Walnut came at fifth position by pushing Oilseeds to sixth position. In 2013-14 the order of first five crops was Maize, Wheat, Rice, Apple and Walnut.

The main crops losing area between 1990-91 to 2013-14 were Rice, Maize, Wheat, Barley, Oilseeds, Pulses, Almond and Saffron, while Apple, Walnut, Bajra and Apricot gained area during the same period.

The change in cropping pattern reflects shift from subsistence cropping to commercial cropping. Table 4.3.3 and 4.3.4 clearly reveals shift from cereal crops mainly Rice, Maize, Wheat, Barley etc. in favour of fruits and spices like Apple, Walnut, Apricot and high value quality Saffron in Jammu and Kashmir

Fig: 2

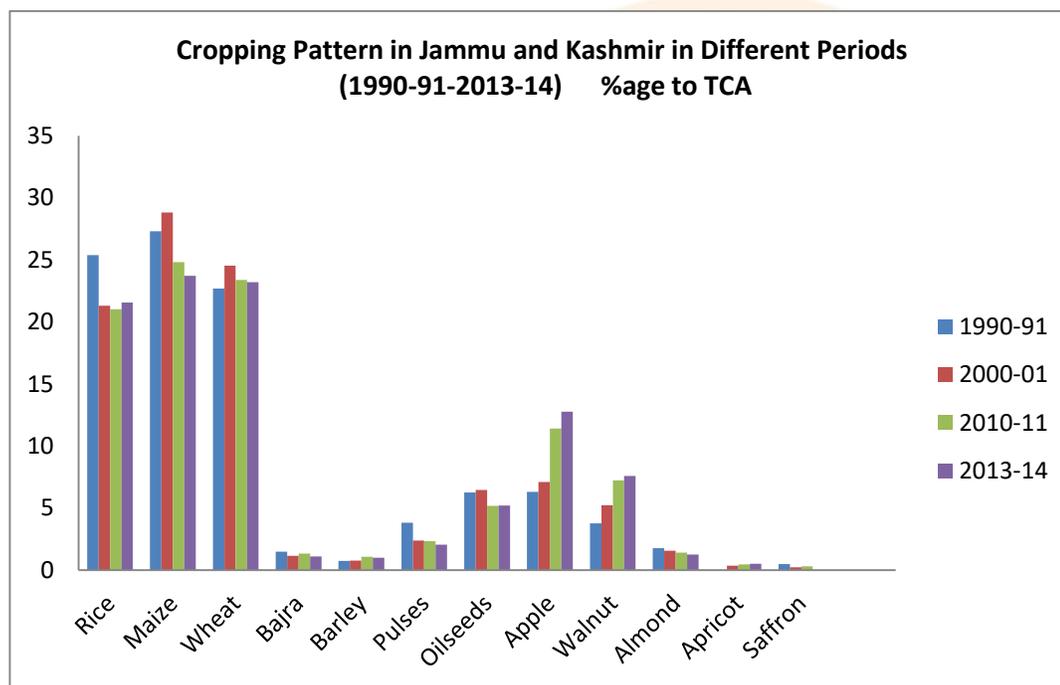


Table.4**Variations in Area Sown under Different Crops in Jammu and Kashmir.****(1990-91 to 2013-14)****(In Percentages)**

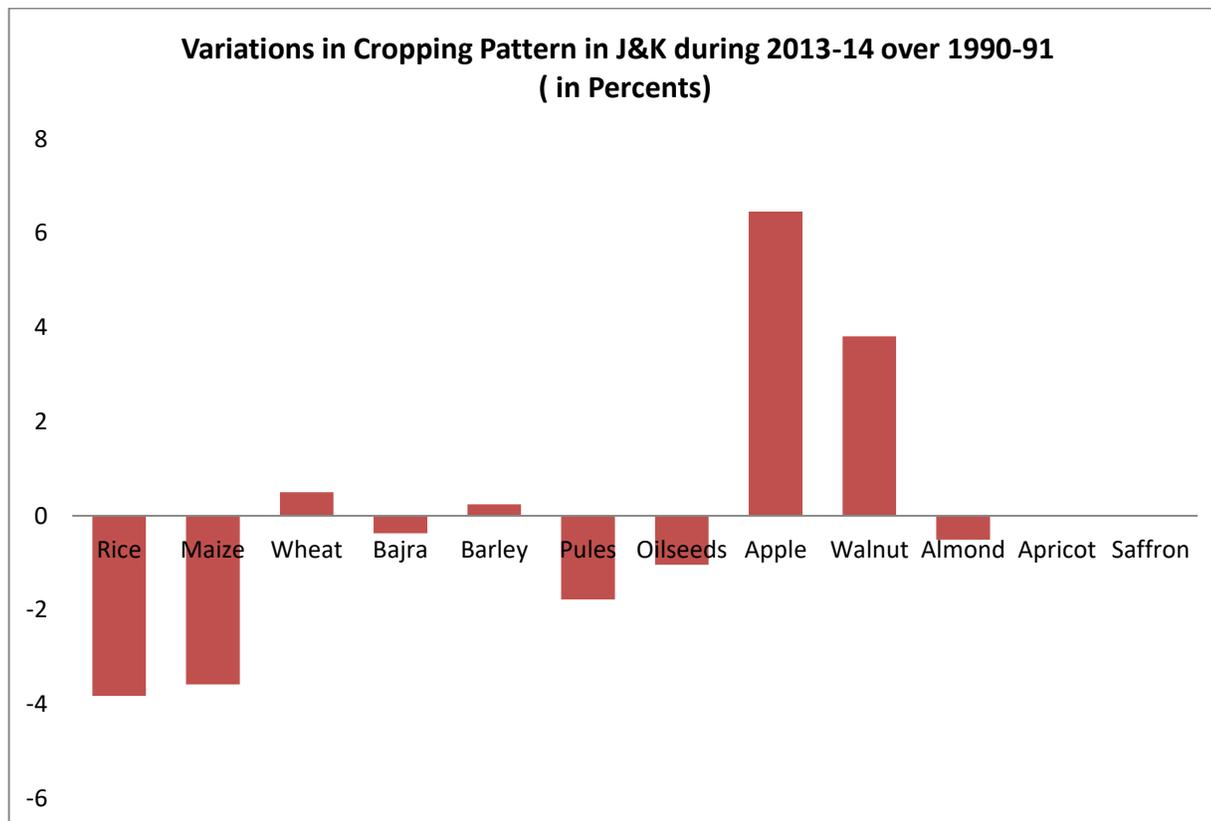
Crops	2000-01 Over 1990-91	2010-11 Over 2000-01	2013-14 Over 200-11	2013-14 Over 1990-91
Cereal crops				
Rice	-4.08	-0.27	0.52	-3.83
Maize	1.53	-4.02	-1.09	-3.58
Wheat	1.83	-1.13	-0.2	0.5
Bajra	-0.32	0.18	-0.23	-0.37
Barley	0.02	0.3	-0.08	0.24
Total Cereals	-1.04	-4.95	-1.08	-7.07
Pulses	-1.43	-0.07	-0.28	-1.78
Oilseeds	0.2	-1.26	0.02	-1.04
Fruits				
Apple	0.8	4.29	1.37	6.46
Walnut	1.44	2.00	0.37	3.81
Almond	-0.2	-0.16	-0.15	-0.51
Apricot	NA	0,12	0.04	NA
Total fruits	2.4	6.24	1.63	10.27
Saffron	-0.23	0.04	-	-

Source: Computed by Author.

The above table 4 reveals the decline in the percentage of area under cereal crops and increase in horticulture crops. During 1990-91 to 2013-14 percentage shares of cereal crops like Rice, Maize and Bajra declined about, 3.83 per cent, 3.58 per cent, and 0.37 per cent respectively. The percentage shares of Pulses, Oilseeds and Almond also declined about 1.78 per cent, 1.04 per cent and 0.15 per cent respectively during same period. However the percentage share of total cereal crops declined about 7.07 per cent during 1990-91 to 2013-14.

Whereas horticulture crops like Apple and Walnut improved to 6.46 per cent and 3.81 per cent respectively during the same period. However the percentage share of total fruits increased about 10.27 per cent.

The picture in the above table clearly depicts that there has been diversification of crop area away from cereal crops to horticulture crops. The table is clear evidence of substitution of area from cereals to horticulture crops.

Fig: 3**TABLE. 5****Crop Diversification Indices for Jammu and Kashmir (1990-91 to 2013-14)**

S No	Year	Crop Diversification Indices
1	1990-91	17.58
2	2000-01	15.57
3	2010-11	15.50
4	2013-14	15.67

Source: Computed by Author from Data Obtained.

The indexes of crop diversification in J&K are calculated by Jasbir Singh's Method:

$$Icd = \frac{\text{Percentage of total Cropped area under "n" crops}}{\text{Number of "n" crops}}$$

Here those “n” crops are identified whose proportion is 5% of total cropped area.

The table reveals steady diversification in the initial years but few periods indicates more diversification. Considering the value of crop diversification indices for Jammu and Kashmir from 1990-91 to 2010-11, relatively more diversification in the year compared to other years could be attributed mainly to the peasant's performance for growing more number of commercial crops and less number of subsistence crops. The value of crop diversification indices for Jammu and Kashmir during 2013-14 is relatively less compared to previous years due to short period of time (4 years). The diversification in cropping pattern mainly towards Apple and Walnut was noticed during recent years.

Fig:4

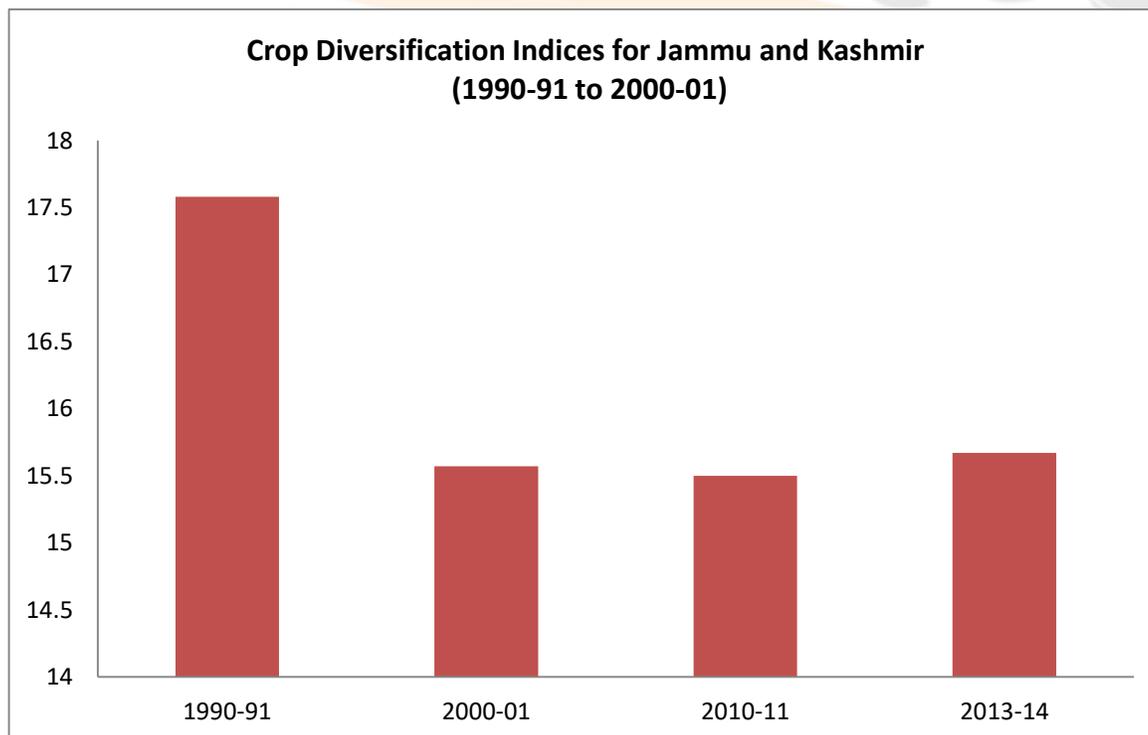


Table. 6**District wise Indices of Crop Diversification in Jammu and Kashmir – 2013-14**

S No	Districts	Crop Diversification Indices	Group of Crops
1	Anantnag	19.54	R, MZ, OS, AP, WN
2	Kulgam	19.17	R, AP, WN, OS, MZ
3	Pulwama	16.42	R, OS, AP, AL, WN, MZ
4	Shopian	30.89	AP, OS, WN
5	Srinagar	19.43	AP, R, AL, MZ, WN,
6	Ganderbal	19.71	AP, WN, R, MZ, OS
7	Budgam	16.15	R, MZ, AP, WN, AL, OS
8	Baramullah	30.42	R, MZ, AP
9	Bandipora	15.81	R, MZ, AP, WN, B, P
10	Kupwara	24.97	R, MZ, AP, WN
11	Leh	23.68	W, AC, AP, P
12	Kargil	24.93	AC, W, P, AP
13	Jammu	31.30	R, W, MZ
14	Samba	18.95	R, W, MZ, BR, P
15	Udhampur	28.93	R, W, MZ
16	Reasi	30.15	MZ, W, WN
17	Doda	17.52	MZ, WN, AP, W, B
18	Kishtwar	17.71	MZ, WN, AP, W, B
19	Ramban	16.05	MZ, WN, AP, OS, W, B
20	Kathua	28.84	W, R, MZ
21	Rajouri	43.71	MZ, W
22	Poonch	23.38	MZ, W, WN, R

Source: Computed by Author from Data Obtained.

(R= Rice, MZ= Maize, W= Wheat, B= Barley, BR= Bajra, OS= Oilseeds, P= Pulses, AP= Apple, WN= Walnut, AL= Almond, AC= Apricot.)

Crop diversification indices for districts in Jammu and Kashmir are also calculated by Jasbir Singh's method mentioned above. The above table reveals that in all the districts except Rajouri, Jammu Reasi and Shopian high diversification of crops occurred in recent years.

District Bandipora has the highest diversification of crops followed by Budgam, Pulwama and Ramban with six crops combination. On the other hand district Rajouri with two crops combination has the lowest diversification of crops followed by Jammu, Reasi and Shopian with three crops combination.

It is clearly observed that most of districts of the state has been diversifying cropping pattern mainly towards commercial crops especially fruits including fresh and dry from cereal crops .

Determinants of Crop Diversification in J&K

Crop diversification in any region is determined by various factors like, changing social, economic, technological, geographical and institutional structure of that region.

Likewise in the state of Jammu and Kashmir, major underlying factors which are conceived to be great importance in determining the allocation of land resources among competing crops are price and yield of different crops, level of irrigation, rainfall, availability and variation of agricultural inputs, climatic conditions and demand of increasing population.

On the one hand increase in price and productivity of cash crops like Apple, Walnut, Oilseeds, Almond, Saffron etc. to that of cereal crops has tempted the farmers to allocate resources to produce commercial crops in preference to cereal crops. Therefore, high relative price and productivity of commercial crops at the existing state of technology has created an affinity of farmers towards high value crops.

On the other hand there are other factors like, rainfall, irrigation, improvement and availability of technology, demand of increasing population, geographical conditions etc. allowed farmers to diversify their cropping pattern mainly towards HVCs.

Monsoon has also played a key role in diversification of crops from subsistence to value addition in the state, as J&K state is dependent on monsoons and most of area is rain fed. Factors like irrigation, favorable climate etc. has provided a desire to produce high value cash crops which results diversification of crops.

It is observed that before 1990 production of crops was primarily organized for self-consumption and so the cropping pattern prompted by family requirements of the farmers. But after 1990, in a system of commercialized agriculture, cultivation of crops is contingent upon these factors. After having obtained self-sufficiency in food grains production, agriculture has become increasingly commercialized. The fundamental change seems to have been possible primarily due to the drastic expansion of irrigation. The technological change that has taken place in the field of irrigation has remarkable impact on productivity and cropping intensity growth in the state. In most of area in the state with good irrigation facilities cropping pattern has become diversified.

In view of above arguments, all factors have played prominent role in diversifying crops, but rain fall has shown significant effect on the variation of acreage, because if rain disappears for a long time, then production and productivity will be greatly affected.

Conclusions:

One of the main channels through which diversification towards high-value crops can enhance farmer's income is via the participation of small farmers. However, although smallholders have the benefits of proportionally large labour pools; this may be offset by constraints such as lack of access to credit. Thus, there is continued debate as to whether smallholders can successfully diversify into the high value sector.

Using district level data from J&K, we herein show that smallholders show more participation in high-value crops, especially fruits compared to larger farmers. This is not to say, of course, that the observed level of diversification is necessarily the optimal level. Given the high labour endowments in the state and the preponderance of smallholders the share of resources allocated to high value agriculture continues to be relatively small, although it is increasing over time. Conditional on supporting infrastructure and institutions, smallholders have an advantage when adopting labour intensive crops such as fruits. The bias towards fruits rather than vegetables clearly points to the role of enabling factors in transforming the potential advantages of the smallholders (such as large families) into realized crop choices that favour high-value products.

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