

# CHANGING CROPPING PATTERN IN INDIAN AGRICULTURE

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*In recent past, many studies have been conducted on the issue of agricultural productivity and output in India and the factors impacting it. Some of such studies came out with the conclusion that during post-economic reforms period, farmers and other farm workers tend to migrate from farm to non-farm activities and to the urban areas for search of alternate employment opportunities in manufacturing and tertiary activities. It also resulted in increase in the number non-cultivating peasant household (NCPHs) as farmers were increasingly leaving cultivation and leasing their land to others which adversely impacting the agricultural productivity and output. Disapproving the findings of earlier studies, this paper, using NSSO 59th round (2002-03) and 70th round (2012-13) data, establishes that it is not that agricultural output declines due the above said structural changes/ changes in the land owning pattern in agriculture sector in India or movement of farm workers to non-farm activities and to the urban areas, rather the pattern of crop cultivation has been changing since 2002-03 across agro-climatic zones of India and farmers are increasingly shifting from cultivation of traditional intensive subsistence non-commercial/ non-cash crops to commercial/ cash crops which is favourably impacting the level of productivity and output in agriculture sector in India.*

**Keywords:** New landlord, Peasant, Land-lessee relation, Farm and Non-farm sector

## INTRODUCTION

Traditionally, agriculture and allied sector has been the primary source of livelihood of the people living in rural India. Not only the proportion of dependence of the rural masses on agriculture and allied activities has been substantial but also in terms of employment generation and contribution to national economy, the importance of agriculture and allied sector has been immense. Even after implementation of the New Economic Policy (NEP) of 1991 and consequent economic reforms, the importance of agriculture and allied sector in terms of employment generation and a source of livelihood of rural India has been enormous. However, contribution of this sector to the Gross Domestic Product (GDP) is on decline *vis-à-vis* the manufacturing and services sector.

Notably, over the years, agriculture sector in India has been experiencing marked changes with respect to area under cultivation, cropping pattern, productivity, use of technology, land holding pattern and reforms thereof, use of fertilizers and pesticides, pattern of irrigation and area under irrigation, use of high yielding variety of seeds *etc.* Issues associated with the said parameters of agriculture and their changing dimensions have been under the research domain of various scholars over the years with varying research outcomes. It may be noted that, of the aforesaid issues, much interest have been shown to study changing cropping crop pattern of agriculture in India which has significant bearing on agricultural productivity and volume of agricultural output of different crops. In the recent past, many studies have also undertaken to establish that there was a trend amongst

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the farmers in rural India during the post reforms period to shift from farm to non-farm activities mainly because of decline in profitability in farming activities. Other than decline in profitability in agriculture, availability of employment opportunities outside the agriculture sector (Chand and Srivastava, 2014), lower per-capita output compared to manufacturing/ capitalist sector (Rains and Fei, 1961) *etc.* are stated to be reasons of such shifting. The aforesaid trend of shifting of farmers from farm to non-farm activities appears to be in tandem with the Arthur Lewis' contention that there has been unlimited supply of labour in subsistence (agriculture) sector and due to economic expansion or availability of activities outside agriculture sector, the labour supply to non-farm (capitalist) sector tends to increase over the years (Arthur Lewis, 1954). Arthur Lewis advocated that expansion of the capitalist/ industrial sector is nourished by the supply of cheap labour from the agricultural/ subsistence sector. Because of labour surplus and other inherent lapses in agriculture sector, output per head in this sector is often lower than capitalist sector. It is due to the low labour output ratio in agricultural sector and rising employment opportunities outside the agriculture sector, labourers employed in agricultural activities tends move toward the non-farm sector in rural areas or to the urban areas for search of employment opportunities in non-farm/ manufacturing activities, which has been considered as the major reason of rural-urban labour migration. As the economy experiences development and achieves higher growth rate of GDP, there is a tendency on the part of the labourers, those who were earlier engaged in agricultural activities, to move to the non-farm activities. As revealed from some of the recent studies that, in India, workers engaged in the agriculture and allied activities are moving to non-farm activities over the years and the said movement is affecting the productivity and output of agricultural sector. A brief of the available literature on related issues and the emerging research question for the purpose of this paper has been outlined in the subsequent sections.

## LITERATURE REVIEW & RESEARCH QUESTIONS

From the available literature it is observed that in the recent past, agriculture sector in India has experienced structural changes in terms of *inter alia* land market, lessor-lessee relation and agricultural productivity. Vijay (2012) while analysing the structural changes in agriculture sector in India, has coined a new concept for land owners in rural India namely, 'new landlord'. As stated above, traditionally agriculture sector has been surplus labour and they tend to migrate to non-farm activities and to the urban areas over the years in search of employment opportunities in manufacturing sector. Binswanger-Mkhize (2013) study has revealed that because of the structural transformation in Indian rural economy, farm workers move primarily from agriculture sector to the rural non-farm sector and to the urban areas to secure jobs with pension and health benefits. Accordingly, the movement of farm workers from agriculture sector to the rural non-farm sector formed an informal sector (Vijay, 2012). It is because of this movement, agriculture sector has been experiencing labour shortage which in turn causing the agricultural productivity and output to decline. Thus, the scholars considered the movement of farm workers from agricultural sector to non-farm sector as one of the important reasons of decline in agricultural productivity and output. Besides the scarcity of labour supply in the agriculture sector, changes in land-lessee relationship is also affecting the agricultural productivity and output. It is established that changes in land-lease relationship over the years in rural India has generate a new class who has own the land but do not cultivate (Vijay, 2012). Such households are termed as 'non-cultivating peasant households' (NCPHs). Owing to the owning of land, such households can influence the land market so on the agricultural productivity and output. Even though, NCPHs do not cultivate despite holding land, they may earn by leasing it. According to Vijay (2012), the number of NCPHs in India has increased over the years and such households are moving from farm to non-farm sector, even migrating to

urban areas in search of employment in manufacturing sector. Also, it is observed that NCPHs are either 'too poor to farm' implying they cannot meet the minimum required expenses for the farming activities or such households are 'too busy to farm' implying that they have profitable employment opportunities in non-farm sector.

NCPHs are those households who own land but do not cultivate, as such households include agricultural labour, rural artisans and others. However, such households continue to exert and influence the land market, land lease relationship and the productivity and output of agriculture activities in rural India. They earn income from non-farm sector and rent from their land holding. From the definition of NCPHs, it is clear that such households are non-cultivator but are peasants to the extent that they are moving away from cultivating practices to non-farm activity without breaking their peasant origins (Vijay, 2012). However, Reddy and Shaw (2012) established that declining cropped area may not hold on the emergence of new landlord *i.e.* NCPHs and it may be due to changing terms of tenancy *i.e.* share cropping or increase in reverse tenancy. Also, from the study of Reddy and Shaw (2012) it is revealed that share cropping is mainly among the marginal holdings while fixed rent is for large holdings.

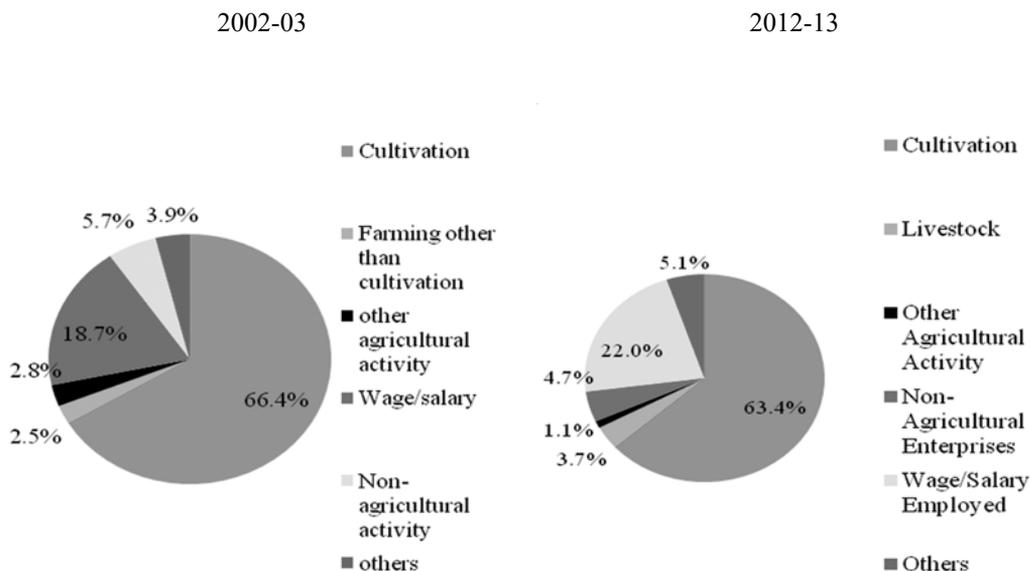
It is observed from the above studies that the number of NCPHs has been increasing over the years and they are moving to non-farm sector either after disposing their land holdings or by leasing the same to other cultivators who do not own land and the same is significantly affecting the agricultural productivity and output. Contrary to the aforesaid finding that farmers and labourers are shifting from farm activities to non-farm activities over the years resulting in lower agricultural productivity and output, this paper argues that it is not that the agricultural productivity and output has declined across agro-climatic zones in India due migration of farm farmers and labourers to non-farm activities and increase in the number of NCPHs rather, farmers are changing their cropping pattern *i.e.* moving from production of non-commercial crops to commercial crops, resulting in increase in the productivity of commercial crops across all agro-climatic zones in India. There are fifteen agro-climatic regions in India, major six of them include Himalayan Region, Gangetic Regions, Plateau Region, Coastal Region and Gujarat & Dry Region. To substantiate the argument, this paper uses National Sample Survey Office (NSSO) data, collected in its 59<sup>th</sup> round (2002-03) and 70<sup>th</sup> round (2012-13) surveys, relating to changes in the principal sources of income of the people in rural India and changes in the cropping pattern during 2002-03 and 2012-13 across agro-climatic zones in India. Present paper has tried to answer following research question : i) 25 there proportionate change in agriculture productivity and output across agro-climate zones. and ii) Whether the farmers are moving from non-commercial to commercial crops.

## **STRUCTURAL CHANGE IN THE PRINCIPAL SOURCE OF INCOME IN RURAL INDIA**

As per NSSO survey, the principal source of income of the people of rural India includes cultivation, farming other than cultivation/ livestock, other agricultural activity, wage/ salary employed non-agricultural activity/ non-agricultural enterprises and others. From NSSO's 59<sup>th</sup> round (2002-03) and NSSO 70<sup>th</sup> round (2012-13) data, it is observed that principal sources of income of the people of rural India have experienced a change. If we closely look at the proportionate changes in some of the principal sources of income of the people of rural India during 2002-3 and 2012-13, it reveals an interesting fact and contradicts the findings of the earlier studies that there was a trend amongst the people of rural India to leave agricultural activities and move to non-farm sector for their livelihood which in turn adversely impacted the productivity and output in agriculture

sector. The following pie diagram captures the proportionate changes in different principal sources of income of the people of rural India during 2002-03 and 2012-13.

**Fig.1: Structural Change in Principal Source of Income**



Source: Data Compiled from NSSO 59<sup>th</sup> round (2002-03) and from NSSO 70<sup>th</sup> round (2012-13)

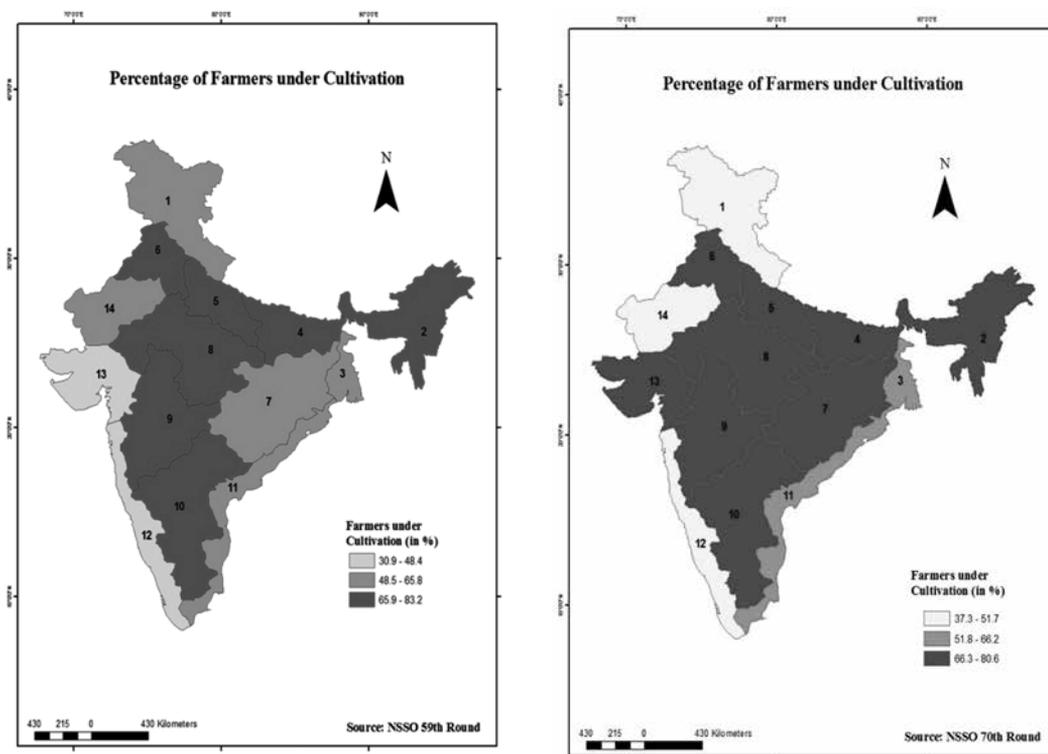
Looking at the data relating to non-agricultural activities as a source of principal income during the aforesaid period in the above pie chart, it is clear that it was decreased from 5.7 percent in 2002-03 to 4.7 percent in 2012-13. This decline is a clear indication that dependency of the rural people on non-agricultural activities has reduced during the aforesaid period which is contrary to the earlier findings that people of rural areas are migrating to non-agricultural activities and urban areas resulted in lower agricultural productivity and output. Further, if we see the proportionate change in cultivation as the principal source of income during the said period, it may be observed that there was a marginal 3 percent decline from 66.4 percent in 2002-03 to 63.4 percent in 2012-13. Moreover, if we compared agriculture and allied activities *i.e.* combination of cultivation, farming other than cultivation and other agricultural activities as a source of principal income of the people of rural India during the said period, it experienced a marginal decline from 71.7 percent in 2002-03 to 68.2 percent in 2012-13. This marginal decline in agriculture and allied activities as a source of principal income cannot be attributed to migration of farmers and labourers from farm activities to non-farm activities as many of the earlier studies revealed. The similar trend is also observed across agro climatic zones in India with minor variation.

## FARMERS UNDER CULTIVATION

Another factor to assess the research question in hand is to study the proportionate change in the farmers under cultivation and level of concentration of agricultural activities. To substantiate the argument, NSSO 59<sup>th</sup> round (2002-03) and 70<sup>th</sup> round (2012-13) data on the proportionate change

in the farmers under cultivation has been used. The data compiled from the aforesaid NSSO surveys on the area under cultivation by farmers in different agro-climatic regions of India has been shown in the following map 1:

**Map 1.: Farmers Under Cultivation during 2002-03 to 2012-13**



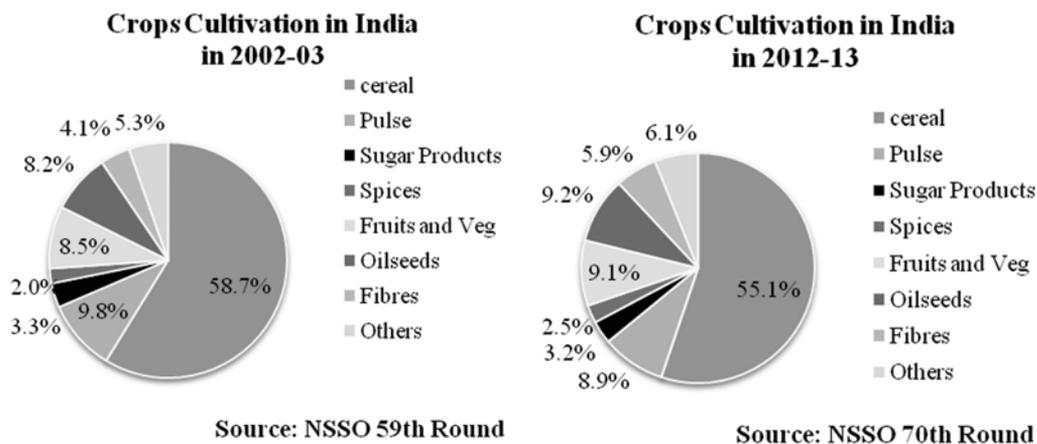
**Source:** Data Compiled from NSSO 59<sup>th</sup> round (2002-03) and from NSSO 70<sup>th</sup> round (2012-13)

NSSO classified the intensity of cultivation by farmers across all agro-climatic zones into three broad categories *i.e.* high concentration, middle concentration and low concentration areas. It is observed from the map that during 2002-03 to 2012-13, the geographic areas where large scale cultivation takes place *i.e.* high concentration of agricultural activities has increased substantially during 2002-03 and 2012-13 in all gangetic regions (except lower gangetic region), eastern Himalayan region and plateau region (except eastern plateau region). Middle concentration is observed in western Himalayan region, western dry region, lower gangetic region, eastern plateau region and east coast region during 2002-03 and in lower gangetic region and east coast region during 2012-13. As far as low concentration is observed in western Himalayan region, western dry region and western coast region. It may be noticed that dependency on cultivation as principal source of income in rural area has been increased in Gujarat and Eastern Plateau region while it has decreased in western Himalayan region and western dry region. Thus, dependency on cultivation in the most of the agro-climatic regions has not decreased which is contrary to the claims made in the earlier studies.

## CHANGING CROPPING PATTERN IN INDIA

Not only the dependency on cultivation across agro-climatic regions has not decreased showing large chunk of rural workers still pursuing cultivation and considering it as the principal source of income but also it is observed from the NSSO data that cropping pattern across agro-climatic regions in India has changed during 2002-03 and 2012-13. Fig. 2 depicts changing cropping pattern in India during 2002-03 to 2012-13.

**Fig.2 Farmers under different Crop Cultivation in India (in %)**



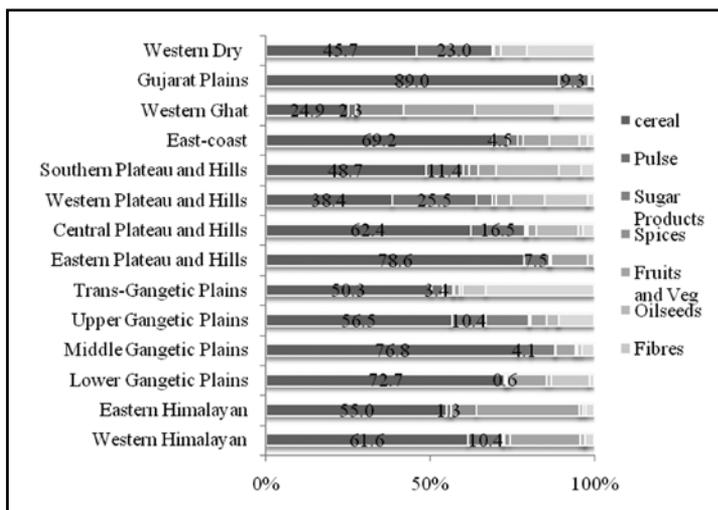
Source: Data Compiled from NSSO 59<sup>th</sup> round, 2002-03 and from NSSO 70<sup>th</sup> round, 2012-13.

From fig. 2, it may be observed that 58.7 percent farmers were engaged in cereal cultivation in 2002-03 which was reduced to 55.1 percent in 2012-13. Similarly, 9.8 percent farmers grew pulse in 2002-03 which was reduced to 8.9 percent in 2012-13. Except in these two crops, in other crops the proportion has increased during the said period. It may be noted that as 8.5 percent farmers cultivated fruits and vegetables in 2002-03 which was increased to 9.1 percent in 2012-13, 8.9 percent farmers were engaged in cultivation of oilseeds in 2002-03 which was increased to 9.2% in 2012-13. Further, percentage of farmers engaged in fibre production has increases from 4.1 percent to 5.9 percent during the said period. The same trend is also observed in case of spices. The percentage of farmers engaged in production of spices grew from 2 percent to 2.5 percent during the said period. From the above, it can be observed that other than cereals and pulses, farmers in India have increasingly engaged in the production of commercial crops such as fruits and vegetables, oilseeds, fibres *etc.* during 2002-03 to 2012-13. Thus, it is not that farmers are losing interest in farm activities and moving to the non-farm sector for search of employment, rather they are more intensively moving towards cultivation of cash/ commercial crops such as oilseeds, fruits, vegetables, spices, *etc.* from the traditional non-cash/ non-commercial crops such as than cereals and pulses.

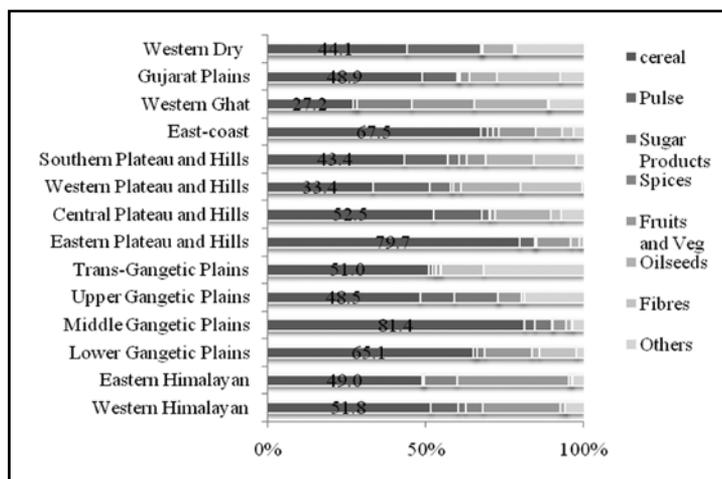
## Changing Cropping Patterns under Different Agro-climatic Regions

Following Fig.3 and Fig.4 show the cropping pattern under different agro-climatic regions during 2002-03 to 2012-13.

**Fig. 3: Farmers under Different Crop Cultivation in Different Agro-Climatic Regions during 2002-03 (in %)**



**Fig. 4: Farmers under Different Crop Cultivation in Different Agro-Climatic Regions during 2012-13 (in %)**



Source: Data Compiled from NSSO59<sup>th</sup> round, 2002-03 and 70<sup>th</sup> round, 2012-13.

The above figures shows that during 2002-03 and 2012-13, in Himalayan regions, the proportion of farmers who are cultivating fruits & vegetables and sugar has increased while the proportion of farmers who are engaged in the cultivation of cereals and pulse has declined. In all gangetic regions, the proportion of farmers who are cultivating cereals, pulse and sugar has declined however, fruits & vegetables cultivation has increased in lower and upper gangetic region. Beside these regions, in all plateau regions the proportion of farmers who are cultivating cereals, pulses and fruits & vegetables has declined and, except southern plateau region, the proportion of farmers who are cultivating oilseeds has increased during 2002-03 and 2012-13. In east coast region, cultivation of

Appendix-A. Cropping Pattern in different agro-climatic regions in India (% of Farmers)

Agro-climatic Region	Cereal			Pulse			Sugar Product			Spices			Fruits and Vegetables			Oilseeds			Fibres			Others		
	NSS	NSS	NSS	NSS	NSS	NSS	NSS	NSS	NSS	NSS	NSS	NSS	NSS	NSS	NSS	NSS	NSS							
	70th Round	59th Round	70th Round	59th Round	70th Round	59th Round	70th Round	59th Round	70th Round	59th Round	70th Round	59th Round	70th Round	59th Round	70th Round	59th Round	70th Round	59th Round	70th Round	59th Round	70th Round	59th Round	70th Round	
Western Himalayan	61.6	51.8	10.4	8.6	0.5	2.3	1.7	5.6	21.5	24.5	1.4	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	2.8	5.7	
Eastern Himalayan	55.0	49.0	1.3	0.6	0.1	0.2	7.6	10.3	31.4	35.5	0.9	0.7	1.1	0.3	0.3	0.3	0.3	0.3	0.3	0.3	2.6	2.6	3.5	
Lower Gangetic Plains	72.7	65.1	0.6	1.2	0.1	0.1	0.9	2.4	11.1	14.9	1.4	2.4	11.7	11.8	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	2.2	
Middle Gangetic Plains	76.8	81.4	4.1	3.3	7.2	5.5	0.3	0.2	5.7	4.3	0.8	1.6	1.3	0.4	3.8	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	
Upper Gangetic Plains	56.5	48.5	10.4	10.6	13.0	13.9	0.5	0.1	5.0	7.3	3.5	1.0	0.2	0.0	10.8	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	
Trans-Gangetic Plains	50.3	51.0	3.4	1.4	3.2	0.9	0.1	0.1	1.9	1.4	0.6	0.2	7.3	13.5	33.1	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	
Eastern Plateau and Hills	78.6	79.7	7.5	4.8	0.3	0.1	0.3	0.5	11.2	10.9	1.6	2.7	0.3	1.1	0.2	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.0	
Central Plateau and Hills	62.4	52.5	16.5	15.3	0.2	2.3	0.5	0.4	2.7	1.4	12.7	17.8	1.7	3.2	3.4	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	
Western Plateau and Hills	38.4	33.4	25.5	18.0	5.0	6.7	1.0	0.7	4.6	2.5	10.2	18.9	13.2	19.3	2.0	0.5	0.5	0.5	0.5	0.5	2.0	2.0	0.5	
Southern Plateau and Hills	48.7	43.4	11.4	13.6	1.8	3.7	2.6	2.3	5.6	6.0	19.1	15.2	6.7	13.6	4.2	2.2	2.2	2.2	2.2	2.2	4.2	4.2	2.2	
East-coast	69.2	67.5	4.5	2.3	2.7	1.5	1.9	2.1	7.9	11.4	9.0	8.5	2.7	3.6	2.1	3.2	3.2	3.2	3.2	3.2	2.1	2.1	3.2	
Western Ghat	24.9	27.2	2.3	1.2	0.1	0.1	14.6	17.2	21.6	19.7	24.3	23.5	0.8	0.1	11.3	11.0	11.0	11.0	11.0	11.0	11.3	11.3	11.0	
Gujarat Plains	89.0	48.9	9.3	11.2	0.4	0.4	0.0	0.4	0.9	3.1	0.1	8.5	0.0	20.0	0.4	7.4	7.4	7.4	7.4	7.4	0.4	0.4	7.4	
Western Dry	45.7	44.1	23.0	23.4	0.0	0.0	0.0	0.3	0.6	0.2	2.0	10.1	7.9	0.6	20.7	21.3	21.3	21.3	21.3	21.3	20.7	20.7	21.3	
India	58.7	55.1	9.8	8.9	3.3	3.2	2.0	2.5	8.5	9.1	8.2	9.2	4.1	5.9	5.3	6.1	6.1	6.1	6.1	6.1	5.3	5.3	6.1	

Source: Data Compiled from NSSO 59<sup>th</sup> round, 2002-03 and from NSSO 70<sup>th</sup> round, 2012-13.

cereals, pulse, sugar and oilseeds has decreased while fruits & vegetables, spice has increased. In western Ghat region, there is increase in the proportion of farmers who are engaged in the cultivation of cereals and spice during the said period. Apart from these regions, cultivation of cereals as well as fruits and vegetable in Gujarat has declined while pulses, oilseeds and fiber production have increased during the said period. In dry region, cultivation of oilseeds has increased. Broadly, it is observed that the proportion of farmers who are engaged in the cultivation of cereals and pulses in all agro-climatic regions of India has declined during the said period, which shows that farmers are increasingly moving towards cultivation of cash/ commercial crops from the cultivation of traditional non-cash/ non-commercial crops.

## CONCLUSION

Contrary to the findings of earlier studies that during post-economic reforms period farmers are losing interest from cultivation because of structural changes (increase in NCPHs) in rural economy and they are increasingly moving towards non-farm activities leading to fall in agricultural productivity and output, this paper, using NSSO's data, proved that it is not that people in rural India are leaving agriculture rather, a trend is observed amongst the farmers that they are moving to the cultivation of more remunerative commercial crops in place of traditional cash crops. This paper provides that the proportion of high concentrated on cultivation areas has slightly decreased during 2002-03 and 2012-13 but the dependency of the farm workers on cultivation has increased during the said period in different agro-climatic regions of India. It is also found that during the said period farmers have changed their crop pattern in order to reap the benefits of economic expansion. They have now increasingly cultivating more cash crops such as oilseeds, spices, fibres, *etc.* compared to non- cash crops such as cereals. The same trend was observed across all agro-climatic regions of India.

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