

## **STRUCTURAL TRANSFORMATIONS IN KERALA'S ECONOMY: IS THERE ANY ROLE OF AGRICULTURE SECTOR?**

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*Structural transformation is a process by which the relative importance of different sectors and activities of an economy changes over time. Kerala's model of economic development has also witnessed several structural transformations during the period of 1980-81 to 2010-11. One of the structural transformations is sharp reduction in the share of primary sector in GSDP. But, the corresponding decline in employment share has not taken place in primary sector. Kerala did not experience a sequential growth process (as propounded by structural change growth theories) as the service sector led growth did not provide employment matching with its income and the process of industrialization failed to take off as share of income from secondary sector did not commensurate with the level of employment in the sector. The changes in land use pattern in Kerala were unprecedented during the past decades in terms of deforestation, increase in area as current fallow, increase in area under non-agricultural land, decrease in both net area sown and gross cropped area resulting in decline in cropping intensity. Irrigation intensity of only 20 per cent points that about 80 per cent of the cropped area is rain-fed. Kerala witnessed shift in the cropping pattern in favour of non-food crops at the expense of food crops as crops such as pulses, rice, tapioca, cashewnut, ginger were replaced by commercial cash crops like rubber and coconut. The declining cultivable area, predominance of tiny and fragmented holdings, decline in work force in terms of reduction in agricultural labour and cultivator has made farming more vulnerable. Finally, the study has suggested some policy suggestions such as training to labour moved to secondary sector, keeping a check on the area under food crops, bringing more area under assured irrigation, strict law enforcing mechanism to avoid unnecessary conversion of agricultural land to non-farming activities, creation of 'Labour Banks' to revive agricultural economy of the Kerala.*

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### **INTRODUCTION**

Structural transformations/changes are considered as a crucial factor for economic development. It has been argued that economic growth and development are strongly inter-linked with the structural changes. Structural changes are considered as the vehicle of economic growth and economic growth in turn also induces structural changes (Van Gemert, 1986). The structural changes would ideally imply as those changes which take place primarily due to economic development and result in shift in the shares of gross domestic product (GDP) and labour force from primary sector to secondary sector and the tertiary sector. During the structural transformation, labour is pulled out of agriculture at a speed that depends on the labour intensity of industry and services. A turning point is reached when the share of labour in agriculture starts to decline faster than its share in output and the productivity differential between the sectors starts to diminish (Binswanger-Mkhize, 2012).

The development experience of Kerala, popularly known as Kerala Model of Development (KMD) has received international attention owing to its high achievements in the social sectors such as adult literacy, life expectancy, infant mortality and birth rates with a weak commodity producing sectors. The remarkable achievement of Kerala in respect of human development,

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despite stagnation in agriculture and a low rate of economic growth has been a puzzle to development experts (Rajan, 2011). According to the Indian Human Development Report (2011), among the Indian states, Kerala stands first in Human Development Index. The high Physical Quality of Life Index (PQLI) of Kerala is at par with the developed western nations. The Census of India (2011) reveals that Kerala is the highest literate state in the country with 93.91 per cent of literacy rate against the national level of 74.04 per cent. The gender ratio in Kerala shows that it has more female population than male. Kerala represents the highest sex ratio with 1084 females per 1000 males against 940 at India level. It is also the state with the lowest positive population growth rate in India. Kerala has experienced a very low population growth rate (0.91 per cent) compared to the national population growth rate (1.93 per cent) during 1991-2001.

Kerala's economy has also been experiencing a wide variety of changes in its productive sectors and other dimensions of the economy and the economy has changed from a traditional backward agrarian economy to modern growing economy (Rajan, 2011). The changes in Kerala's economy have led to a structural transformation, giving it a non-agrarian character, both in terms of income and employment, which has now possessed new difficulties for agricultural development at a time when there is a scarcity of labour as well as profits (Kannan, 2011). Agriculture development experience of Kerala, since the last seventies has been characterized by sharp decline in the share of agriculture and allied sectors in gross state domestic product (GSDP) and area under food crops and the substantial expansion in the area under non-food crops (Karunakaran and Gangadharan, 2013).

Agriculture sector is the primary sector whose growth acts as a catalyst to the growth of other sectors. Several studies (Unni, 1983; Mahesh, 1999, 2000; Narayana, 1990; Nithya, 2013) in the context of Kerala's agriculture has largely concentrated on agricultural trends such as land utilization pattern, cropping pattern and the area, production and productivity growth, particularly of plantation crops like rubber, coconut, coffee, cardamom and tea etc. There also exist several studies (Kannan and Pushpangadan, 1989; Sivanandan, 1985; Kannan, 2011; and George, 2011) that deal with the performance of agriculture in state in relation with national perspectives. The present study deviates from the above studies and makes an attempt to identify the structural transformations in Kerala's economy since 1980-81 and tries to identify the role of agriculture sector in causing the structural transformations. As discussed earlier, theorists have also propounded the different stages through which economy's growth is transited from agriculture through industry to the service sector. Thus, the study attempts to find out whether structural changes in Kerala economy have taken place as per the various structural transformation theories propounded or not. The significance of the present study lies in the fact that the structural transformation in the Kerala economy has not so far been addressed in a detailed and comprehensive manner in the earlier studies.

## **STRUCTURAL TRANSFORMATIONS IN KERALA**

### ***Changes in Sectoral Structure of Output***

Table 1 shows the sectoral contribution of GSDP in different sectors of Kerala economy during 1980-81 to 2010-11. The contribution of agricultural sector in GSDP has continued to decline over the years; while that of other sectors, particularly services has increased. In 1980-81, primary sector contributed about 38 per cent of GSDP, which declined to 27.82 per cent, 21.88 per cent

and 10.37 per cent in 1990-91 and 2000-01 and 2010-11 respectively. Out of the total share of 38 per cent of the GSDP from primary sector in 1980-81, agriculture and allied activities accounted for 21 per cent followed by forestry and logging (13.26 per cent), fishing (3.40 per cent) and mining and quarrying (0.19 per cent). The share of agriculture and allied sectors in GSDP has rapidly declined from 21.04 per cent in 1980-81 to 7.78 per cent in 2010-11.

All the sub-components of primary sector except mining and quarrying have witnessed a decline over the last three decades. Forestry and logging has declined from 13.26 per cent in 1980-81 to 1.25 per cent in 2010-11. All the sub-components of secondary sector have shown an increasing trend during the period of 1980-81 to 2010-11. In the secondary sector, construction sector has contributed the highest share in GSDP. The share of the tertiary sector, which comprises of transport and communication; storage; trade, hotels and restaurants; banking and insurance; real estates and ownership of dwellings; public administration and other services has leaped up from 45.22 per cent in 1980-81 to 54.54 per cent in 1990-91. It further hiked to 58.32 per cent in 2000-01 and 67.61 per cent in 2010-11. The tertiary sector is the one, which has consistently shown high growth rates. The growth in aggregate income has been largely achieved due to the buoyancy in tertiary sector only. Under tertiary sector, all the sub-components have shown an increasing trend during the entire study period, except trade, hotel and restaurant. In 1980-81, the share of trade, hotel and restaurant in GSDP was 19.87 per cent, which increased to 20.42 per cent in 2000-01 with marginal decrease to 19.26 per cent in 2010-11. The contribution of public administration to GSDP has also increased from 2.09 per cent in 1980-81 to 3.61 per cent in 2010-11 (Table 1). There is a large decline in the contribution of primary sector to the total GSDP and a rapid increase in the contribution of service sector. More than half of the share of primary sector had declined from 1980-81 to 2010-11. The growth of secondary sector has also increased, but there is not much variation and the lion share of GSDP is now contributed by tertiary sector.

### ***Changes in Sectoral Structure of Employment***

Employment elasticity varies from sector to sector. Some sectors, by their very nature, are labour intensive. Also, demand for labour depends on the relative prices of capital and labour (Rangarajan, 2006). The sectoral composition of employment in Kerala is given in Table 2. The sectoral composition of employment shows the dominance of tertiary sector from 1999-2000 onwards. The 38<sup>th</sup> round of NSSO showed that majority of the workforce was engaged in primary sector followed by tertiary and secondary sectors as 46.2 per cent of the population in Kerala was engaged in primary sector, 31.1 per cent in tertiary sector and 22.3 per cent in secondary sector in 1983. During 43<sup>rd</sup> round, the employment in primary sector declined to 44.2 per cent, while in case of secondary and tertiary sectors, it increased to 22.7 per cent and 33 per cent respectively. Under 50<sup>th</sup> round of NSSO, percentage share of employment in primary as well as tertiary sector has decreased, while that in secondary sector has increased. From 55<sup>th</sup> round onwards, Kerala's sectoral share of employment is higher in tertiary sector. The 68<sup>th</sup> round indicates that the employment was the highest in tertiary sector (42.6 per cent) followed by secondary (31.8 per cent) and primary sectors (25.5 per cent).

Figure 1 shows the relative comparison of sectoral contribution of GDP in Kerala with India. There was a sharp decline in the share of output from primary sector in both Kerala and India. But, the decline was much faster in Kerala than India.

**Table 1**  
**Sectoral Contribution in GSDP of Kerala (%) (at 2004-05 prices)**

<i>Sectors/Sub-sectors</i>	<i>1980-81</i>	<i>1990-91</i>	<i>2000-01</i>	<i>2010-11</i>	<i>Growth rate (%)</i>
<b>Agriculture and allied activities</b>	21.04	21.87	17.49	7.78	2.5
<b>Forestry and logging</b>	13.26	2.22	2.15	1.25	-0.91
<b>Fishing</b>	3.40	3.22	1.93	0.95	1.5
<b>Mining and quarrying</b>	0.19	0.51	0.31	0.39	7.15
<b>Sub-total of primary sector</b>	37.90	27.82	21.88	10.37	1.88
<b>Manufacturing</b>	7.65	9.19	9.77	7.95	5.1
<b>Electricity, gas and water supply</b>	1.16	0.96	2.17	1.28	8.11
<b>Construction</b>	8.07	7.50	7.86	12.79	7.03
<b>Sub-total of secondary sector</b>	16.88	17.64	19.79	22.02	6.25
<b>Railways</b>	0.34	0.41	0.44	0.43	5.1
<b>Transport by other means</b>	2.32	3.97	6.72	7.40	9.15
<b>Communication</b>	0.30	0.46	1.38	6.90	16.25
<b>Storage</b>	0.03	0.05	0.05	0.05	5.75
<b>Trade, hotel and restaurants</b>	19.87	19.83	20.42	19.26	5.22
<b>Banking and Insurance</b>	0.99	2.61	4.90	7.17	12.23
<b>Real estate etc services</b>	9.80	14.56	10.64	11.78	5.31
<b>Public administration</b>	2.09	3.39	4.00	3.61	7.39
<b>Other services</b>	9.49	9.26	9.78	11.00	4.81
<b>Sub-total of tertiary sector</b>	45.22	54.54	58.32	67.61	6.28

Source: GoK (Various Issues)

The primary sector accounted for only 10.37 per cent of total output in Kerala and 14.59 per cent in India during 2010-11. The secondary sector has improved its share in GDP from 16.88 per cent to 22.02 per cent in Kerala and from 18.5 per cent to 20.3 per cent in India during the three decadal periods, while it is almost stagnant at about 20 per cent in India during 1990-91 and 2000-01. The share of tertiary sector was much higher for Kerala than India between 1990-91 and 2010-11. During this period, the share has increased from 54.54 per cent to 67.61 per cent in Kerala as against an increase from 49.61 per cent to 65.1 per cent in India.

**Table 2**  
**Sectoral Share of Employment in Kerala and India (%)**

NSSO Rounds	Primary		Secondary		Tertiary	
	Kerala	India	Kerala	India	Kerala	India
<b>38th (1983)</b>	46.2	68.59	22.3	13.78	31.1	17.63
<b>43rd (1987-88)</b>	44.2	64.87	22.7	17.04	33	18.09
<b>50th (1993-94)</b>	43.5	63.98	23.8	14.96	32.7	21.07
<b>55th (1999-00)</b>	33.1	60.32	28.3	16.24	38.6	23.43
<b>61st (2004-05)</b>	31.6	56.30	28	18.78	40.4	24.92
<b>68th (2011-12)</b>	25.5	48.9	31.8	24.26	42.6	26.84

Source: NSSO (Various Rounds)

Table 2 shows the sectoral share of employment in Kerala and India based on various NSSO rounds. The share of employment in primary sector in Kerala has throughout remained less than the share in India. But, both Kerala and India has experienced downfall in primary sector. Thus, the share of employment in primary sector in Kerala stood at only around 25 per cent, whereas it still provided employment to about half of the population in India as a whole. Kerala and India witnessed a steady increase in the share of secondary and tertiary sectors. The share in both the sectors has always remained higher in Kerala than that in India. Thus, it can be easily inferred

from the above analysis that the share of agriculture sector in output and employment has systematically gone down in Kerala, whereas in India, the share of output in GDP has fallen down drastically but about 50 per cent of the population still depends on the agriculture and allied activities.

### ***Casualisation of Rural Workforce***

Table 3 shows the distribution of usually employed persons by status of employment in Kerala. There are mainly three categories of employment, namely, self-employed, regular employment and casual labours. In Kerala, the percentages of self-employed persons in rural and urban areas are declined. In 1983, 51.5 per cent of rural persons and 46.8 per cent of urban persons were self-employed. While, in 2011-12, the proportion of self-employed persons declined to 38.2 per cent and 36.4 per cent in rural and urban areas respectively. The regular employed persons witnessed an increasing trend in both rural and urban Kerala. During 1983, only 12.6 rural persons were regular employed in Kerala, which increased to 17.8 per cent in 2011-12, while regularly employed persons in urban areas were 32 per cent in 1983 which increased to 35.8 per cent in 2011-12.

In Kerala, the percentage share of casual labours in the distribution of usually employed persons has also increased in both rural and urban areas during 1983 to 2011-12. The percentage of casual labours engaged in Kerala has increased from 35.8 per cent to 44 per cent in rural areas and from 24.8 per cent to 27.8 per cent in urban areas during 1983 to 2011-12. The increase in casual labours was higher in rural areas than that in the urban areas which points labourers working in rural areas start getting more of casual works rather than regular works. In urban areas, the percentage of casual labours was highest in 1999-00 (40.5 per cent) and lowest in 1987-88 (22 per cent).

**Table 3**

### **Distribution of Usually Employed Persons by Status of Employment in Kerala ( in %)**

<i>Year</i>	<i>Self employed</i>		<i>Regular employment</i>		<i>Casual labours</i>	
	<i>Rural</i>	<i>Urban</i>	<i>Rural</i>	<i>Urban</i>	<i>Rural</i>	<i>Urban</i>
<b>1983</b>	51.5	46.8	12.6	32.1	35.8	24.8
<b>1987-88</b>	51.1	46.3	10.8	31.8	38.0	22.0
<b>1993-94</b>	45.4	39.8	11.5	26.8	43.1	33.4
<b>1999-00</b>	45.6	21.8	14.0	16.3	41.1	40.5
<b>2004-05</b>	43.7	26.4	15.8	25.4	41.6	38.6
<b>2009-10</b>	39.8	34.1	19.4	34.2	40.7	31.8
<b>2011-12</b>	38.2	36.4	17.8	35.8	44.0	27.8

Source: Same as Table 2.

## **PATTERN OF AGRICULTURAL DEVELOPMENT IN KERALA**

### ***Changes in Land Use Pattern***

Kerala has witnessed major changes in its land use pattern over the period. The most important change is the shrinkage of area devoted to cultivation of food crops and an increase in the rate of deforestation (George, 2001). The total geographical area of Kerala is 3885 thousand hectares. Land under forests has remained same (1082 thousand hectares) as it includes all forested areas and land classified or administered as forests under any legal enactment dealing with forests, whether state or private owned (GoK, 2008). Land put to non-agricultural use include land

occupied by buildings, roads, railways or water (e.g. rivers, canals) and land in use other than agricultural purposes. From 1980-81 onwards, area put to non-agricultural use had steadily increased from 6.94 per cent in 1980-81 to 9.89 per cent in 2010-11 of the total geographical area of the state. On the other hand, area under barren and uncultivable land (which includes areas under mountains, deserts etc.) has witnessed a continuous decline from 85 thousand hectares in 1980-81 to 20 thousand hectares in 2010-11. Area under permanent pastures and other grazing land has also steady declined from 5.4 thousand hectares to 0.15 thousand hectares i.e. from 0.13 per cent to 0.004 per cent of total geographical area of Kerala during the period under study.

**Table 6**  
**Land Use Pattern in Kerala (Area in 000'ha)**

<i>Classification of land</i>	<i>1980-81</i>	<i>1990-91</i>	<i>2000-01</i>	<i>2010-11</i>
<b>Geographical area</b>	3885.50 (100)	3885.50 (100)	3885.50 (100)	3885.50 (100)
<b>Forest</b>	1081.50 (27.83)	1081.50 (27.83)	1081.50 (27.83)	1081.50 (27.83)
<b>Land put to non-agricultural uses</b>	269.80 (6.94)	297.38 (7.65)	381.87 (9.83)	384.17 (9.89)
<b>Barren and uncultivable land</b>	85.80 (2.21)	58.31 (1.50)	29.32 (0.75)	19.57 (0.50)
<b>Permanent pastures and grazing land</b>	5.40 (0.139)	1.91 (0.049)	0.16 (0.004)	0.15 (0.004)
<b>Land under tree crops</b>	63.90 (1.64)	34.38 (0.88)	15.41 (0.40)	3.69 (0.09)
<b>Cultivable waste</b>	129.00 (3.32)	94.61 (2.43)	59.26 (1.53)	91.67 (2.36)
<b>Current fallow</b>	43.60 (1.12)	44.16 (1.14)	77.85 (2.00)	76.03 (1.96)
<b>Fallow other than current fallow</b>	26.90 (0.69)	26.47 (0.68)	33.99 (0.87)	51.94 (1.34)
<b>Net Sown Area (NSA)</b>	2179.60 (56.10)	2246.77 (57.82)	2206.13 (56.78)	2071.51 (53.30)
<b>Area sown more than once</b>	705.20 (18.15)	773.21 (19.90)	815.56 (20.99)	575.95 (14.82)
<b>Gross cropped area</b>	<b>2884.80</b>	<b>3019.98</b>	<b>3021.68</b>	<b>2647.46</b>
<b>Cropping intensity</b>	<b>132.35</b>	<b>134.41</b>	<b>136.97</b>	<b>127.80</b>

*Source:* Same as Table 1.

Area under miscellaneous tree crops has also declined continuously from 63.9 thousand hectares (1.64 per cent) in 1980-81 to 3.69 thousand hectares (0.09 per cent) in 2010-11. Cultivable waste represents land available for cultivation, but not occupied for actual cultivation or uncontrolled after a few years of cultivation for one reason or other. Area under cultivable waste land has decreased from 3.32 per cent in 1980-81 to 1.53 per cent in 2000-01 and after that the increasing trend in the area was noted. An increasing trend in the area under current fallow was noted in the period of 1980-81 to 2000-01. It increased from 43.6 thousand hectares (1.12 per cent of total area) in 1980-81 to 77.85 thousand hectares (2.0 per cent) in 2000-01. While in the next ten year period, there was a slight decline in area under current fallow as it was 76.03 thousand hectares (1.96 per cent) of total geographical area in the year 2010-11. Area under fallow other than current fallow land was 26.9 thousand hectares (0.69 per cent of total geographical area), which increased to 51.94 thousand hectares in 2010-11(1.34 per cent). Net sown area (NSA) had increased from

2179 thousand hectares (56.10 per cent) in 1980-81 to 2246 thousand hectares (57.82 per cent) in 1990-91. It declined to 2071 thousand hectares (53.30 per cent) in 2010-11 (Table 6).

Gross cropped area represents the net area sown and area sown more than once during the same year. During the period under study, area sown more than once showed a fluctuating trend and reached the peak level during 2000-01 with 815.56 thousand hectares (20.99 per cent of total geographical area). NSA represents the total area sown with crops and orchards. Area sown more than once in the same year is counted only once. Area sown more than once has also increased from 18.15 per cent in 1980-81 to 20.99 per cent in 2000-01. However, it sharply declined to 14.82 per cent in 2010-11. Although the cropping intensity has increased from 132.5 in 1980-81 to 136.97 in 2000-01, but thereafter it has sharply declined to 127.80 in 2010-11 (Table 6). This points that land use changes in Kerala were unprecedented during the past decades in terms of deforestation, increase in area as current fallow, decrease in both net area sown and gross cropped area resulting in decline in cropping intensity.

### ***Pattern of Irrigation***

Irrigation is considered as one of the most important inputs in the agriculture production as it plays an important complementary role in the production process. The irrigation development in Kerala is apparently different from that of the rest of the country although the state is blessed with timely and satisfactory rainfall with an annual rate of 3107 mm (GoK, 2013). As regards the pattern of irrigation from different sources, the major sources of irrigation in the state are canals, tanks and wells including tube wells. During 1980-81, the major sources of irrigation in the state were government canals, which accounted for about more than one-third of the total area under irrigation, followed by private tanks.

**Table 7**  
**Source-wise Pattern of Irrigation in Kerala (ha)**

<i>Sources</i>	<i>1980-81</i>	<i>1990-91</i>	<i>1999-00</i>	<i>2010-11</i>
<b>Govt. canals</b>	99397 (41.77)	104265 (31.28)	81231 (21.37)	85825 (20.68)
<b>Private canals</b>	5299 (2.23)	3691 (1.11)	4803 (1.26)	1971 (0.47)
<b>Govt. tanks</b>	5048 (2.12)	2514 (0.75)	1832 (0.48)	1777 (0.43)
<b>Private tanks</b>	50922 (21.40)	46438 (13.93)	51100 (13.45)	49287 (11.88)
<b>Govt. wells</b>	-	745 (0.22)	1347 (0.35)	603 (0.15)
<b>Private wells</b>	-	64933 (19.48)	120258 (31.64)	137113 (33.08)
<b>Other sources</b>	43606 (18.32)	110783 (33.23)	119472 (31.44)	138437 (33.36)
<b>Net irrigated area</b>	<b>237974</b>	<b>333369</b>	<b>380043</b>	<b>415013</b>
<b>Irrigation intensity</b>	<b>10.92</b>	<b>14.84</b>	<b>17.23</b>	<b>20.03</b>

*Source:* Directorate of Economics and Statistics, Kerala.

From 1980-81 to 1990-91, irrigation through government canals had a dominant place compared to the other sources. In 1999-2000, its share dwindled and after that a small increment was witnessed in 2010-11. The irrigated area under private wells has increased significantly. During

1990-91, the irrigated area under private wells was 64933 ha (19.48 per cent) which increased to 137113 ha (33.08 per cent) in 2010-11. Meanwhile, the area irrigated through government wells went down from 745 ha to 603 ha in the same period. The other major sources include getting water from rivers and lakes, natural streams etc. It has also increased from 43,606 ha (18.32 per cent) in 1980-81 to 1,38,437 ha (33.36 per cent) in 2010-11. Net irrigated area has increased from 237974 ha in 1980-81 to 415013 ha in 2010-11 resulting in increase in irrigation intensity from 10.92 per cent to 20.03 per cent during the same period (Table 7). Despite the investments on canal irrigation, the area under this system has not increased much. However, irrigation through canals has also contributed to rise in the water levels in the soil through water seepage and supported ground and other surface water irrigation (GoK, 2014). Tanks, even though they are not as important for the state as they are in the other states, still contribute to 10 per cent of the total area irrigated, as per the data of 2010-11.

### ***Shift from Food to Cash Crops***

The performance of major crops during the period 1980-81 to 2010-11 in terms of the trend growth rates in their area, production and yield is shown in Figure 1. Only five major crops namely, rubber, coffee, coconut, pepper and to some extent tea has displayed increase in area, production and yield over the past three decades. The production of rice, pulses, cashew nut and ginger have experienced a conspicuous decline largely due to the reduction in area under these crops though yield of these crops improved to some extent. Area under paddy has declined although there have been some attempts to conserve paddy area through measures such as the Kerala Conservation of Paddy and Wetland Act, 2008 (GoK, 2014a). Cashew nut experienced decline in productivity in the 1990s, which showed signs of improving in the 2000s. In the case of coffee and cardamom, growth of production was high in the 1990s due to the growth of productivity. However, in case of coffee yield decreased in 2000s.

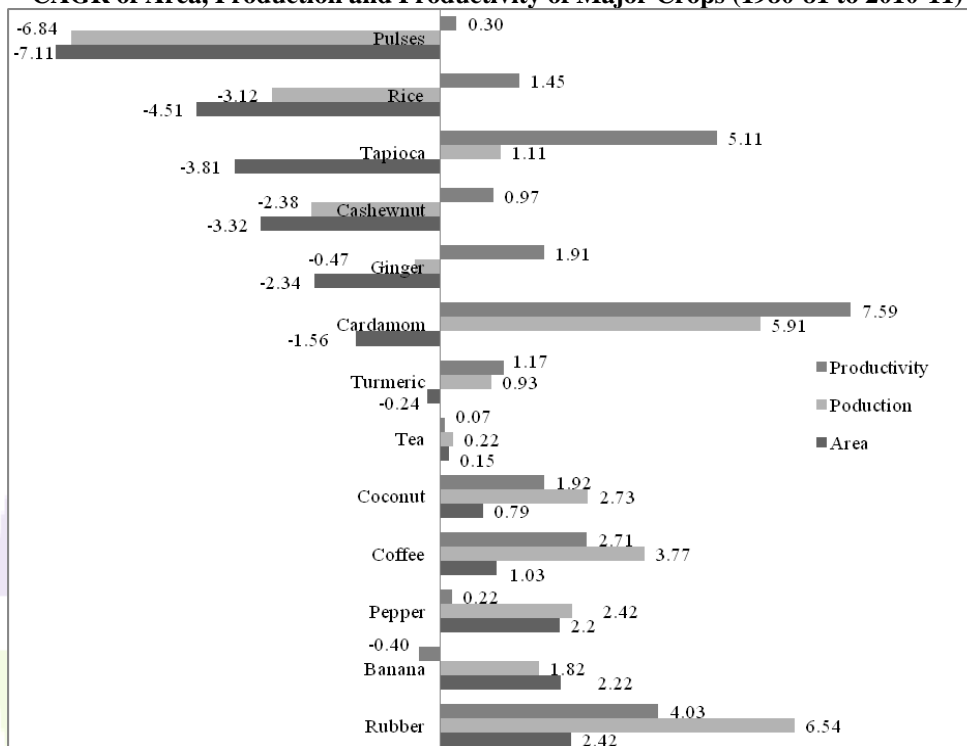
Between 1980-81 and 2010-11, growth in the area of most of the crops was negative. Rice and tapioca became lesser important crops compared to other crops in Kerala as area has declined by three-fourth from 801 thousand hectare to 213 thousand hectare for rice and from 245 thousand hectare to 72 thousand hectare for tapioca in 1980-81 to 2010-11. However, productivity of these crops has increased during this period. The area under rubber has increased two times from 237.8 thousand hectare to 534.2 thousand hectare in the same period. Rice, pulses, cashewnut and tapioca are the crops which have lost their area during the last three decades.

Except banana, the growth rate of productivity was positive for all crops from 1980-81 to 2010-11. Growth rate of area, production and productivity of some crops like coconut, coffee, pepper and rubber was positive during the whole period. The growth rate of area as well as production was highest in case of rubber (Figure 1). Kerala state which had a low base in food production is facing serious challenges in retaining even this meagre area. Kerala agricultural economy is undergoing structural transformation from the last few decades by switching over a large proportion of its traditional crop area, which was devoted to subsistence crops like rice and tapioca to more remunerative crops like rubber, coconut and other plantations (GoK, 2014). Thus, from the above analysis, it can be discerned that agriculture in Kerala has suffered a severe setback during the recent years, particularly in terms of loss in area. The declining production in some crops like rice, pulses, cashew nut and to some extent ginger etc. is a main cause of concern. However, one



positive outcome that can be observed is that most crops have managed to improve their productivity (except banana and tea) even in the midst of losing share in area.

**Figure 1**  
**CAGR of Area, Production and Productivity of Major Crops (1980-81 to 2010-11)**



Source: Same as Table 1.

### ***Agricultural Labourers and Cultivators***

The profile of workers' population in Kerala is given in Table 8. The three-decade period from 1981- 2011 shows almost stagnancy in the nature of workers population in the state. In 1981, the number of main workers was 68 lakh constituting about 27 per cent of total population. After one decade, this number rose to nearly 83 lakh constituting 28.53 per cent of total population. The number of main worker remained almost stagnant during the next two decades (2001- 2011). On the contrary, the agricultural work force has exhibited an unsteady performance. There were 19.2 lakh agricultural labourers in 1981, which rose to 21.2 lakh during the 1990s. During the decade from 1991 to 2001, this number was dropped to 10.2 lakh. The proportion of main workers declined from 28.2 per cent in 1981 to 16.1 per cent in 2011. The recent census estimate (2011) has shown a slight improvement in the number to 16.5 lakh (16.1 per cent of workers population). The cultivators also followed similar pattern to that agricultural labours. The number of cultivators has increased from 8.87 lakh to 10.15 lakh during 1981 to 1991. Thereafter, their number decreased to 5.86 lakh in 2001 with small increase to 7.4 lakh in 2011, whereas their share as a per cent of main workers declined from 13.07 per cent to 12.24 per cent. The cultivators as a share of main workers have declined from 13.07 per cent in 1981 to 7.2 per cent in 2011. Thus, the

number of agricultural labourers and cultivators has declined which points to the fact that they have left farming altogether.

**Table 8**  
**Profile of Worker's Population in Kerala**

<i>Particulars</i>	<i>1981</i>	<i>1991</i>	<i>2001</i>	<i>2011</i>
<b>No. of main workers (in lakh)</b>	67.90	82.99	82.37	82.36
<b>As share of total population (per cent)</b>	26.68	28.53	25.87	24.67
<b>Agricultural labour (in lakh)</b>	19.16	21.19	10.21	16.53
<b>As share of main workers (per cent)</b>	28.23	25.54	12.4	16.1
<b>Number of cultivators (in lakh)</b>	8.87	10.15	5.86	7.40
<b>As share of main workers (per cent)</b>	13.07	12.24	7.12	7.2

Source: Same as Table 1.

### ***Marginalisation of Land Holding***

An operational holding is defined as all land which is used wholly or partly used for agricultural production and operated as one technical unit by one person alone or with others without regard to title, legal form, size or location (Shah, 1985). The size of the land holdings has implications for investments in agriculture, its productivity, farm mechanization and sustaining farm incomes itself (Mahrotra, 2014). Kerala agriculture is mainly dominated by small, marginal and homestead farmers. The average land holding size is smallest in Kerala. Marginal farmers with an area less than one hectare and dominated by home stead farming of 10-20 cents is a special characteristics of Kerala (GoK, 2013).

**Table 9**  
**Average Size, Number and Area of Land Holdings in Kerala**

<b>Land holding</b>	<b>Size (ha)</b>	<b>1995-96</b>		<b>2010-11</b>	
		<b>Number (in lakh)</b>	<b>Area (in lakh ha)</b>	<b>Number (in lakh)</b>	<b>Area (in lakh ha)</b>
<b>Marginal</b>	0.15	59.18 (93.96)	9.12 (53.27)	65.79 (96.33)	8.86 (58.64)
<b>Small</b>	1.33	2.63 (4.17)	3.49 (20.39)	1.80 (2.64)	2.82 (18.66)
<b>Semi-medium</b>	2.55	0.96 (1.52)	2.44 (14.25)	0.57 (0.83)	1.59 (10.52)
<b>Medium</b>	5.26	0.19 (0.30)	1.04 (6.07)	0.12 (0.18)	0.64 (4.24)
<b>Large</b>	35.29	0.02 (0.03)	1.02 (5.96)	0.01 (0.01)	1.19 (7.88)
<b>All size classes</b>	0.27	62.98 (100)	17.12 (100)	68.30 (100)	15.11 (100)

Source: Agricultural Census (Various Rounds)

The trends and patterns in average size, number and area of land holdings are given in Table 9. The average size of operational land holdings has reduced from 0.27 ha in 1995-96 to 0.22 ha in 2010-11. A drastic change has been noticed in the average size of large holdings as average size of such operational holdings has increased from 35.29 ha in 1995-96 to 64.58 ha in 2010-11. While average size of land holdings of marginal, small and medium farmers have more or less remained same during the period. The total number of land holdings has increased from 62 lakh in

1995-96 to 68 lakh in 2010-11. The number and proportion of marginal holdings have increased, while all other categories have witnessed a decline in number and proportion of the holdings.

The percentage share of each type of holding in the total area under operation shows that the share of marginal and large holdings had been increasing, while that of small, medium and semi-medium holdings had been decreasing. In terms of area operated, the share of marginal holdings has increased to 58.64 per cent in 2010-11 from 53.27 per cent in 1995-96. Similarly, the share of operated area under large farm holdings has increased from 5.96 per cent to 7.88 per cent during the same period. Small and marginal holdings together constitute 99 per cent in terms of number of operational holdings and 77 per cent of the operated area in the state during 2010-11. Thus, over the period, the marginal category has emerged as a distinct and dominant class.

### ***Impact on Rural Poverty and Inequality***

Table 10 shows level of poverty and inequality in rural Kerala based on various NSSO rounds. As per the estimates, about 39 per cent of the rural population in Kerala was below poverty line during 1983, while level of inequality was 0.33. Both Gini ratio and poverty has fallen up to 55<sup>th</sup> round of NSSO. During 61<sup>st</sup> round, about 13 per cent of the population was below the poverty line and the inequality stood at 0.34. Thereafter, the extent of poverty declined to only 9 per cent while the inequality remained at a relatively higher level of 0.41.

**Table 10**

### **Poverty and Inequality in Rural Kerala**

<i>NSSO Rounds</i>	<i>Poverty (%)</i>	<i>Inequality (Gini Coefficient)</i>
38th (1983)	39.03	0.33
43rd (1987-88)	29.1	0.323
50th (1993-94)	25.76	0.287
55th (1999-00)	9.38	0.27
61st (2004-05)	13.2	0.341
68th (2011-12)	9.1	0.412*

Note: \*for year 2009-10

Source: NSSO (various rounds)

### ***Fertilizer Consumption***

Table 11 depicts the consumption of three main chemical fertilizers in Kerala during the last three decades. There is a fluctuation in the consumption of fertilizers in Kerala. During 1980-81, the fertilizer consumption was 97.6 metric tonnes, which increased to 244.4 metric tonnes in 1990-91. Thereafter, it declined to 173.2 metric tonnes in 2000-01. However, total fertilizer consumption has again increased to 283.5 metric tonnes in 2010-11. Kerala is a relatively low fertiliser consuming state in comparison with other major agricultural states in the country (GoK, 2014a). Per hectare fertiliser consumption of Kerala also showed a fluctuating trend from 1980-81 to 2010-11. During 1980-81, per hectare fertilizer consumption was estimated to be 33.83 kg which increased to 80.92 kg in 1990-91. It declined to 57.32 kg per ha in 2000-01. During this period, the fertilizer consumption has also declined from 244.4 metric tonnes to 173.2 metric tonnes. During 2010-11, per hectare fertilizer consumption was 107.10 kg per ha. One reason why Kerala consumed lower fertilisers could be that its cropping pattern is rapidly replaced with plantation crops, which require relatively lower amount of fertilizers besides gross cropped area has also reduced over the past many years (GoK, 2014).

**Table 11**  
**Fertilizer consumption in Kerala (Kgs.)**

<i>Fertilizer</i>	<i>1980-81</i>	<i>1990-91</i>	<i>2000-01</i>	<i>2010-11</i>
<b>Nitrogen (N)</b>	41,700	93,800	73,756	117,680
<b>Phosphorus (P)</b>	23,400	55,420	37,600	69,000
<b>Potash (K)</b>	32,500	95,155	61,849	96,860
<b>Total (N+P+K)</b>	97600	244375	173205	283540
<b>Per hectare consumption</b>	<b>33.83</b>	<b>80.92</b>	<b>57.32</b>	<b>107.10</b>

Source: Prowess

### ***Pesticide Consumption***

Table 12 showed fluctuations in the pesticide consumption in Kerala over the years. The consumption of pesticides has shown a downward trend from 941 metric tonnes in 1980-81 to around 724 metric tonnes in 1991-92. Over the past 30 years, pesticide consumption reached the highest level of 1058 metric tonnes in 1999-00 and was the lowest at 605 metric tonnes during 2010-11. Per hectare consumption of pesticides has also fluctuated during the last three decades and follows the same pattern. During 1980-81, per hectare consumption of pesticide was around 326 kg which decreased to around 240 kg in 1991-92 though it again increased to 350 kg in 1999-2000. Per hectare pesticide consumption again decreased to 228 kg in 2010-11. It is largely due to popularization of Integrated Pest Management (IPM) approach, which includes cultural, physical and mechanical, biological and need based use of safest chemical pesticides (GoI, 2010).

**Table 12**  
**Pesticide consumption in Kerala (Technical Grade in metric tonne)**

<i>Year</i>	<i>Fungicide</i>	<i>Insecticide</i>	<i>Weedicide</i>	<i>Rodenticide</i>	<i>Total consumption of pesticides</i>	<i>Per hectare consumption (Kg)</i>
<b>1980-81</b>	558.54	305.63	60.49	16.42	941.08	326.22
<b>1991-92</b>	374.46	325.24	20.46	4.09	724.25	239.82
<b>1999-00</b>	472.41	467	108.27	10.24	1057.92	350.11
<b>2010-11</b>	500.63	75.96	27.27	1.2	605.06	228.54

Source: Same as Table 1.

## **CONCLUSIONS AND POLICY SUGGESTIONS**

The study reveals that share of primary sector in GSDP in Kerala has declined sharply, but the corresponding decline in employment share has not taken place. Moreover, the excess labour force has moved from primary sector to secondary sector, thus causing abundance in secondary sector and there was only a meagre increase in share of income from secondary sector in GSDP. The share of income from services sector in GSDP has increased sharply, but it failed to register a sharp increase in employment. Thus, it follows that Kerala did not experience a sequential growth process (as propounded by structural change growth theories) as the service sector led growth did not provide employment matching with its income and the process of industrialization failed to take off as share of income from secondary sector did not commensurate with the level of employment in the sector.

The labour moved to secondary sector is mainly unskilled and thus, it could not be employed. Therefore, sub-sector specific training must be provided to the labour force which will also result in increase in income in secondary and hence, its share. The root cause for the movement of labour can be attributed to the deceleration in growth in agriculture sector in the state. The changes in

land use pattern in Kerala were unprecedented during the past decades in terms of deforestation, increase in area as current fallow, increase in area under non-agricultural land, decrease in both net area sown and gross cropped area resulting in decline in cropping intensity. Furthermore, Kerala witnessed shift in the cropping pattern in favour of non-food crops at the expense of food crops as crops such as pulses, rice, tapioca, cashewnut, ginger were replaced by commercial cash crops like rubber and coconut. It mainly happened due to shortage of labour and less labour requirement for commercial crops (GoI, 2010). The reduction in the area under crops needs to be checked. Although the Kerala Conservation of Paddy Land and Wetland Act, came into effect during December, 2008, but during the period of 2008 to 2013, an area of 20,000 ha was already converted to some other crops. This brings out the fact that even though the Act was passed during 2008, no earnest efforts are seen taken so far to protect the area under paddy (GoK, 2013). So, such Acts needs to be implemented with full force so that the remaining area could be protected.

The declining cultivable area, predominance of tiny and fragmented holdings, decline in work force in terms of reduction in agricultural labour and cultivator has made farming more vulnerable. About 80 per cent of the cropped area is still rain-fed. In order to decrease the reliance on rainfall, more area should be brought under assured irrigation as irrigation is one of the key inputs in farming, which often enhances the use of other inputs used for production. The analysis also shows that area irrigated by government canals and tanks has been drastically reduced. Capital expenditure on irrigation structure should also be put in place so as to expand the area irrigated by government canals and tanks. Since about 99 per cent of the cultivators are marginal and small farmers, a strict law enforcing mechanism must be put in place so that only a meaningful conversion of agricultural land to non-farming activities take place. During the structural transformation, it has been witnessed that labour is pulled out of agriculture, which was also evident from the declining labour force participation rate in rural areas, particularly in case of rural females. In order to address acute labour shortage, 'Labour Bank' should be constituted so that the required number of skilled labourers could be supplied to the needed agricultural operations.

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