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Trends in agriculture, non-farm sector and rural employment in India: An insight from state level analysis

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ABSTRACT

The experience from developed countries established that decline in the share of agriculture in national GDP is an indication of economic progress of the country. However, commensurate with the decline in GDP contribution, the dependency of population on agriculture is also expected to decline. In this context, this paper analysed the performance of Indian agriculture in terms of growth, employment and output using secondary data in the last two decades (1990-2010) at the national level and also with the special focus on the major states. Specifically the paper discuses: (i) agriculture's contribution in the national employment and income, (ii) sectoral changes in employment across the states, and (iii) determinants of rural non-farm employment (RNFE). The results have shown that percentage share of agriculture in employment has declined during last two decades, but it was not comparable to the extent of decline in its share in the national GDP. Dependency on agriculture declined for the male workers, while it increased for female workers in the recent decade, indicating feminization of agriculture. The RNFE in different states exceeded over 25 per cent for 12 out of 17 states, and it was significantly high in the states of Kerala, Jammu and Kashmir and Punjab. The determinant analysis revealed that the infrastructure development, agricultural growth and farm-size are the major factors which positively influenced the RNFE, whereas the share of SC and ST population in rural population had negative effect on the growth of RNFE.

Key words: Agriculture, Determinants, Gross domestic product, Infrastructure, Rural non-farm employment

Accelerating economic growth and providing productive employment to the increasing labour force are the major focus of policy makers. Recently, the development of rural non-farm employment (RNFE) has gained significance for creating job opportunities and promoting rural development (Chadha 2007). A number of studies argued that as the economy advances, the dependency on agriculture for livelihood declines and people shift to more productive non-farm activities (Chand and Srivastava 2014, Venkatesh 2013). Each country passes through this structural shift during the development process. Therefore, it is of interest to know that how country's economic growth and labour force growth had taken place in India. Also, it is necessary to understand the changes in employment pattern over the period and across the regions to correct the imbalances in the regional development and promote overall prosperity of the economy. What is the status of RNFE across the states and how it has changed over time and what are the major pull and push factors which influenced the growth of RNFE? Therefore an attempt has been made in this paper to address some of these questions. The study is framed with the following specific objectives: (i) to examine the agriculture's contribution in employment and output across the regions, (ii) to analyse the changes in participation in employment by different social classes and households, and (iii) to identify the determinants of RNFE growth.

MATERIALS AND METHODS

In this study, all economic activities except primary agriculture, livestock, and fishing in rural areas are considered as RNFE. The study is based on the secondary data on rural employment extracted from the National Sample Survey Organisation (NSSO) quinquennial surveys (55th, 61st and 66th rounds). The study also utilized data on supply of total labour force for agriculture and non-agriculture over the years (1990 to 2010) provided by the United Nations Conference on Trade and Development (UNCTAD) database on population and labour force. The data on other variables like gross domestic product (at 2004-05 prices) and its sectoral share was sourced from the Central Statistical Organisation (CSO) database. The state-wise information

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on non-food expenditure, total consumption expenditure, per capita consumption of electricity, road length, and size of operational land holdings were compiled from the Indiastat database (www.indiastat.com). The determinants of RNFE were analysed using a multiple linear regression model. The state-wise percentage share of RNFE was used as a dependent variable. The following variables were considered as explanatory variables; agricultural gross state domestic product (AgGSDP) in 2004-05 prices (₹ crore/000' ha), average size of land holdings (ha), percentage share of SC and ST population to total population in rural areas, percentage share of non-food expenditure to total consumption expenditure , infrastructure index and rural literacy rate (%).The state-wise data for the selected variables were collected for 20 states for two points of time (2000-01 and 2010-11) and thus point panel data set was constituted for the analysis. Time dummy variable was used in the model to control the effect of time on variations in employment share. It is expected that agricultural growth would develop livelihood of rural households through various linkages which would accelerate demand for non-farm goods and services(Mellor 1978).In order to capture this effect AgGSDP and share of non-food expenditure to total consumption expenditure were included in the analysis and it was expected to have positive influence on the expansion of RNFE. The literature suggests a mixed relationship between average land holdings and RNFE. The proponents of negative relationship claimed that as farm-size decreases the non-farm income increases due to availability of surplus labour in the households (Mecharla 2002, Kumar *et al*. 2011), whereas Atamanov and Berg (2011) found a positive relationship between farm-size and RNF activities. They argued that large farm-size implicitly indicates the wealth of the households and access to education and credit, which enabled them to participate more in RNF activities.

Other variable which influences the rural employment is education; the past studies established the direct association between education and non-farm employment (Wandschneider 2003;Abdulai A and Rees A C 2001). It is hypothesised that education and RNFE have positive relationship, as better educated people would find more jobs in non-farm activities. Therefore, rural literacy rate was chosen as one of the explanatory variables. Social caste was one of the variables which determine the rural employment. Majority of the occupations in rural areas are linked with social class and rigid social structure directly or indirectly hinders rural people to select occupation according to their choice. Mostly backward class population are engaged in agricultural activities. Therefore percentage share of SC and ST population were taken as explanatory variables and it is assumed to have negative influence on RNFE share. Other important variable is infrastructure facilities of the state which plays crucial role in RNFE growth. The present study used infrastructure index as one of the variables and it is expected that states with better infrastructure index are likely to have higher RNFE. The public asset such as road is important factor which determines the rural employment diversification (Escobal 2001).The per capita consumption of electricity, and road density were taken as major infrastructure indicators and the index was calculated as ratio of the infrastructure of individual state in relation to the country average.

RESULTS AND DISCUSSION

Agriculture and rural employment

It is important to understand the nature of growth of the Indian economy and employment pattern for promoting an inclusive growth strategy. As economy grows and labour force rises it is imperative to develop employment opportunities, the mis-match between labour supply and demand would lead to unemployment and poverty. Table 1 shows the trends in share of agriculture in the national income and employment in the last two decades. It is clearly visible that total labour force was added by more than 70 million in each decade. It is to be noted that in the 1990's both male and female forces grew at the same extent, however in 2000's growth of female force was negligible. It is worthy to note that the mechanisation in agriculture also drives labour force away from agriculture (Lahoti and Swaminathan 2013;Mahapatro 2013). Whereas in case of agriculture female labour force registered identical growth in both the decades. It indicates that additional female labours were mainly depending on agricultural sector.It is also witnessed that dependency on agriculture for employment has continuously declined in the last decades, and the decline has greater in 1990's but it still engage more than half male and about 70 percent female workers. A similar trend was observed for China by (Brauw*et al*. 2012), where they have reported that since 2000 the feminization in agriculture has occurred in rural China. Other important feature of the economy is that contribution of agriculture in the national GDP. It is widely agreed that as economy grows the share of agriculture comes down and industry and service sectors occupy prime position. In India also the same pattern was observed, the agriculture sector contribution to the national GDP continuously declined and came down to about 12 per cent in 2010-11. However, the cause of the concern is that dependency of workers on agriculture has not declined to the same extent as observed in other developed countries. The share of agriculture in employment and GDP in most of the developed countries was around 5 per cent (Rangarajan 2006).

Regional trends in employment and GDP

This section discusses in detail the state-wise trends of employment and output. Agriculture contribution to the national GDP was about 20 per cent in 1999-00, but the six states, namely Bihar, Assam, Madhya Pradesh, Punjab, Uttar Pradesh and Haryana were having more than 30% share and Punjab (39.7) was having the highest share (Table 2). Gujarat and Maharashtra were having share of less than 15% and rest of the states were in the range of 20-30%. No state was having the share less than 10%. However, in 2004-05,

Table 1 Trends in the share of agriculture in national GDP and employment

Variables	1990-91	2000-01	2010-11	CAGR (%)	
				1991-2000	2001-2010
Total labour force (in millions)					
Male	239.9	295.2	352.9	2.1	1.7
(%)	73	72	75		
Female	90.6	114	119.7	2.2	0.004
(%)	27	28	25		
Persons	330.5	409.2	472.6	2.1	1.3
Agriculture labour force (in millions)					
Male	142.1	162.3	182.3	1.3	1.1
(%)	68	68	68		
Female	68.1	77.7	87.5	1.2	1.2
(%)	32	32	32		
Persons	210.2	240	269.7	1.3	1.2
Dependency on agriculture by labour force (%)					
Male	59	55	52		
Female	75	68	73		
Persons	64	59	57		
GDP at 2004-05 prices (in ₹ billion)					
Total GDP	13 479	23 428	49 370	6.1	7.8
AgGDP	3 362	4 394	6 068	3.4	3.1
(%)	24.9	18.8	12.4		

Source: Compiled from UNCTAD data base and CSO

Punjab was the only state which showed more than 30% share in GSDP, and Maharashtra and Tamil Nadu were having less than 10% share. The remaining states were recorded a share of 10-30%. In 2009-10, four states (Bihar, Madhya Pradesh, Punjab and Uttar Pradesh) have more than 20% share in GSDP and in another four states a noticeable shift from agriculture was seen and their share was just in single digit. In fact in all the states agriculture's share in GSDP continuously declined during the reference period. Bihar, Haryana and Karnataka have registered a significant decline of more than 10 percentage points during 1999-00 to 2004-05 and Himachal Pradesh (8%) and Punjab (7.4%) have shown a substantial decline in the share during 2004-05 to 2009-10. It is clearly visible that the dominance of agriculture in GSDP has witnessed a sharper decline for most of the states during the last decade.

The state-wise employment trends in agriculture shows a clear picture of complete dominance of agriculture sector in rural employment. In 1999-00, 7 of 17 states employed more than three-fourth of rural labour in agriculture. Except Kerala, in all other states, agriculture employment continued to exceed 60%. The scenario has not changed much in 2009-10 and agriculture has remarkable share (more than 60%) in rural employment. Jammu and Kashmir was the only state which recorded more than 10 percentage points drop in both the sub-periods and reached at 42% in 2009-10. Odisha was the other state which observed 10 percentage points fall in the agriculture employment during 1999-00 to 2004-05. However, the decline was negligible in the subsequent period.

Table 2 Regional trends in the share of agriculture in GSDP and rural employment

States	Share of agriculture in GSDP (%)			Share of agriculture in rural employment (%)			Change in share of agriculture (% points) from			
	1999-2000	2004-2005	2009-2010	1999-2000	2004-2005	2009-2010	1999 to 2004		2004 to 2009	
							GDP	Emp.	GDP	Emp.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Andhra Pradesh	24.1	20.6	17.5	78.5	71.7	69.0	–3.5	–6.8	–3.1	–2.7
Assam	31.1	21.7	19.2	65.3	71.2	69.4	–9.4	5.9	–2.5	–1.8
Bihar	37.2	26.6	21.8	80.0	85.7	85.2	–10.6	5.7	–4.8	–0.5
Gujarat	14.6	13.2	10.0	77.9	75.0	76.9	–1.5	–2.9	–3.1	1.9
Haryana	33.3	21.9	16.3	59.9	54.3	54.0	–11.4	–5.6	–5.6	–0.3
Himachal Pradesh	21.2	19.7	11.8	66.1	65.3	60.5	–1.5	–0.8	–8.0	–4.8
Jammu & Kashmir	28.1	22.3	18.2	66.7	52.8	42.6	–5.8	–13.9	–4.2	–10.2
Karnataka	26.9	15.9	13.8	82.0	81.4	75.5	–11.1	–0.6	–2.1	–5.9
Kerala	20.0	14.2	9.0	42.3	38.1	33.5	–5.8	–4.2	–5.2	–4.6
Madhya Pradesh	30.5	24.4	21.6	87.0	82.0	82.2	–6.1	–5.0	–2.8	0.2
Maharashtra	14.7	8.3	6.5	82.3	79.6	78.5	–6.4	–2.7	–1.8	–1.1
Odisha	24.8	18.8	15.5	78.1	67.2	66.2	–6.0	–10.9	–3.3	–1.0
Punjab	39.7	31.1	23.8	62.7	54.0	51.1	–8.6	–8.7	–7.4	–2.9
Rajasthan	26.5	21.9	18.5	75.0	69.2	63.7	–4.7	–5.8	–3.4	–5.5
Tamil Nadu	16.5	9.6	7.5	67.4	65.0	63.9	–6.9	–2.4	–2.1	–1.1
Uttar Pradesh	32.5	26.9	21.4	73.8	68.5	62.5	–5.6	–5.3	–5.5	–6.0
West Bengal	23.4	19.2	15.6	64.7	62.5	57.1	–4.2	–2.2	–3.5	–5.4
All-India	19.6	16.0	12.4	75.1	70.8	66.8	–3.6	–4.3	–3.7	–4.0

Source: Compiled from various rounds of NSSO reports and CSO.

Interestingly, Asom and Bihar have shown different picture and despite a decline in share in GSDP about 10 percentage points, their share in the employment has increased more than 5 percentage points during 1999-00 to 2004-05. In majority of the states, it is obvious that shift from agriculture was marginal, particularly during 2004-05 to 2009-10. There may be a variety of reasons for this sluggish pace of structural transformation of rural employment, mainly inadequate creation of alternative rural employment opportunities, dearth of timely development of skills of rural workers to engage in new employment opportunities and lack of attraction of rural workers towards non-farm employment could be some of the important reasons.

Changes in the clusters of states

The process of structural transformation of the rural employment in different states was analysed by changes in the composition of states in different clusters. Notionally, based on the rate of RNFE the states were classified into three clusters. The states which provided less than 25% of non-farm employment for the rural workers are taken as low level of RNFE. Similarly, a rate of RNFE ranging between 25 and 40% is considered as medium level of RNFE and the more than 40% share is taken as high level of RNFE. A perusal of Table 3 clearly indicates that although in 1999-2000 more number of states belonged to the low RNFE cluster, and after a decade the picture had changed, gradually the states had moved in to the medium cluster and from medium to the high cluster. In 1999-2000, 8 states were working at low level of RNFE, 7 were at medium and 2 were at a high level, but in 2009-10, 5, 7 and 5 states were placed in the low, medium and high clusters, respectively. The low level of RNFE cluster had witnessed a continuous decline in the number states, whereas just reverse was true for the case for high level cluster. Interestingly, medium cluster was the largest cluster and its strength peaked in 2004-05 and declined in 2009-10. Kerala and Haryana belong to the high level cluster in 1999-00 and this cluster was joined by Punjab and Jammu and Kashmir in 2004-05 and by West Bengal in 2009-10. Uttar Pradesh, Tamil Nadu and Himachal Pradesh dwelled in the medium cluster; despite they had shown improvement in RNFE, not moved to high cluster during the reference period. Overall, each state had shown improvement in development of RNFE base, except Bihar and Asom, which have witnessed a deceleration.

Sectoral share in rural employment

Table 4 summarises sectoral changes in rural employment across the major states over the last decade. This Table shows that in majority of the states the proportion of agriculture employment was the highest and its share has continuously declined across the states and over the years.

Table 3 Changes in the clusters of states by the share of rural non-farm employment

1999-00		2004-05		2009-10	
States	%	States	%	States	%
Low (up to 25%)					
Madhya Pradesh	13.0	Bihar	14.3	Bihar	14.8
Maharashtra	17.7	Madhya Pradesh	18.0	Madhya Pradesh	17.8
Karnataka	18.0	Karnataka	18.6	Maharashtra	21.5
Bihar	20.0	Maharashtra	20.4	Gujarat	23.1
Andhra Pradesh	21.5	Gujarat	25.0	Karnataka	24.5
Odisha	21.9				
Gujarat	22.1				
Rajasthan	25.0				
Medium (25.01% to 40%)					
Uttar Pradesh	26.2	Andhra Pradesh	28.3	Assam	30.6
Tamil Nadu	32.6	Assam	28.8	Andhra Pradesh	31.0
Jammu & Kashmir	33.3	Rajasthan	30.8	Odisha	33.8
Himachal Pradesh	33.9	Uttar Pradesh	31.5	Tamil Nadu	36.1
Asom	34.7	Odisha	32.8	Rajasthan	36.3
West Bengal	35.3	Himachal Pradesh	34.7	Uttar Pradesh	37.5
Punjab	37.3	Tamil Nadu	35.0	Himachal Pradesh	39.5
		West Bengal	37.5		
High (> 40.01%)					
Haryana	40.1	Haryana	45.7	West Bengal	42.9
Kerala	57.7	Punjab	46.0	Haryana	46.0
		Jammu & Kashmir	47.2	Punjab	48.9
		Kerala	61.9	Jammu & Kashmir	57.4
				Kerala	66.5

Source: Compiled from various rounds of NSSO reports.

Table 4 Spatial and temporal changes in structure of rural employment

State	Sectoral share in rural non-farm employment														
	Agriculture			Manufacturing			Construction			Trade, Hotel and restaurant			Others		
	1999-2000	2004-2005	2009-2010	1999-2000	2004-2005	2009-2010	1999-2000	2004-2005	2009-2010	1999-2000	2004-2005	2009-2010	1999-2005	2004-2010	2009-2010
Andhra Pradesh	78.5	71.7	69.0	5.6	8.4	8.5	2.3	3.4	6.4	4.6	6.6	6.7	9.0	9.9	9.4
Asom	65.3	71.2	69.4	3.4	3.1	3.6	2.0	2.8	3.6	9.0	10.2	9.8	20.3	12.7	13.6
Bihar	80.0	85.7	85.2	6.1	3.6	3.4	2.4	3.3	2.6	4.6	2.9	3.2	6.9	4.5	5.6
Gujarat	77.9	75.0	76.9	7.5	8.4	6.0	3.0	3.3	4.6	4.2	5.1	4.3	7.4	8.2	8.2
Haryana	59.9	54.3	54.0	9.0	11.0	10.7	8.6	10.9	12.4	7.3	9.5	7.8	15.2	14.3	15.1
Himachal Pradesh	66.1	65.3	60.5	5.1	5.3	3.8	11.8	11.2	15.9	4.4	5.0	5.3	12.6	13.2	14.5
Jammu and Kashmir	66.7	52.8	42.6	4.8	12.4	10.3	9.8	9.5	14.2	5.1	6.6	11.2	13.6	18.7	21.7
Karnataka	82.0	81.4	75.5	5.4	5.4	5.9	1.5	2.1	4.4	4.5	4.5	6.6	6.6	6.6	7.6
Kerala	42.3	38.1	33.5	13.5	13.9	11.8	10.7	11.6	15.9	13.5	13.1	13.6	20.0	23.3	25.2
Madhya Pradesh	87.0	82.0	82.2	3.8	4.9	3.4	1.9	3.8	6.6	2.8	4.1	3.0	4.5	5.2	4.8
Maharashtra	82.3	79.6	78.5	4.7	5.7	4.8	2.4	2.9	4.0	3.9	4.7	5.3	6.7	7.1	7.4
Odisha	78.1	67.2	66.2	7.5	10.7	7.0	3.5	6.3	10.3	4.9	7.3	6.7	6.0	8.5	9.8
Punjab	62.7	54.0	51.1	7.9	9.4	9.2	7.4	12.8	17.2	8.0	9.0	7.5	14.0	14.8	15.0
Rajasthan	75.0	69.2	63.7	4.8	6.5	4.1	8.9	10.8	17.0	3.9	4.6	5.7	7.4	8.9	9.5
Tamil Nadu	67.4	65.0	63.9	14.0	14.1	11.3	4.1	5.8	9.5	5.7	6.4	6.4	8.8	8.7	8.9
Uttar Pradesh	73.8	68.5	62.5	8.4	9.7	8.1	3.7	6.4	14.3	5.9	7.3	7.3	8.2	8.1	7.8
West Bengal	64.7	62.5	57.1	14.5	11.9	14.2	2.3	4.3	6.3	9.1	10.4	10.0	9.4	10.9	12.4
All-India	75.1	70.8	66.8	7.4	8.2	7.2	3.5	5.4	9.5	5.4	6.7	6.8	8.6	8.9	9.7

Source: As in Table 3.

Now it is instructive to know that which sector has absorbed the moved labour force from agriculture. At the national level about 4% of rural labour moved away from agriculture in 1999-00 to 2004-05 and it was shared by all the non-farm sectors that is manufacturing (0.8 percentage points), construction (1.9 percentage points) and trade, hotel and restaurants (1.3 percentage points). On contrast, during 2004-05 to 2009-10, it appears that entire agriculture labour shift was towards construction sector. Manufacturing was having considerable share in rural employment with 7.4% in 1999-00 and it peaked in 2004-05 and fall to 7.2% in 2009-10. Whereas, construction sector was employing 3.5% labour in 1999-2000 and it gained almost 3 times over a decade and it assumed significant position in rural employment with 9.5% share in 2009-10.The construction sector-led growth of non-farm employment was more pronounced in the states like Kerala, Haryana, Jammu and Kashmir, Himachal Pradesh, Rajasthan and Punjab, which was further fuelled by growth of the manufacturing sector in some of these states in late 2000's. On clear departure from this scenario, Tamil Nadu, West Bengal, Uttar Pradesh, Gujarat, and Odisha witnessed a manufacturing sector-led growth in RNFE. Interestingly, trade, hotel and restaurant services were important for development of non-farm employment in Assam, and this sector also played a marginal role in Kerala, West Bengal, Punjab and Haryana.

Occupation and socio-economic characteristics of rural households

The relation between socio-economic characteristics of rural households and nature of occupation was examined by analysing the NSSO data on occupation-wise distribution of households. Table 5 shows that landless and marginal farmers were the major supply of agricultural labour force in rural areas. Both large and landless farm households were moving out of self- employed in agriculture category during the last decade. Although it gives a mixed picture, reasons for this scenario are divergent. Large farmers' movement could be linked with the pull factor that is better resources and access to non-farm activities, as it is clearly visible that this class improved their percentage share in self-employed in non-farm category. The landless labours movement could be linked with push factor that is distress condition, which forced them to move towards other labour households' category implying casualization of employment. However, the share of self-employed in agriculture and non-agriculture households increased for small and semi-medium class farmers. It implies that reasonable land size which can provide them fair level of income is required for farmers to continue in agriculture. An inspection of caste-wise households reveals socially backward classes were highly depended on agriculture, particularly as daily wage earners. In 1999-2000, more than half of SC households belonged to agricultural labour category and this situation has changed in 2009-10 and most of them have moved to the other non-farm category. Other major households in agricultural labour category were ST households (40%) in 1999-00 and they have witnessed about 6 percentage point reduction during the last decade. Part of them has shifted to other non-farm households and rest to self-employed in agriculture category.

The majority (34%) of the OBC population were under self-employed in agriculture category although there was an increase in 2004-05, but again it has come down to 34% in 2009-10. Caste profile clearly indicates economically backward castes such as SC and ST were working as casual farm labour suppliers and they are migrating towards other causal workers in non-farm sector. By and large it can be concluded that high casualization of rural workers has taken place among vulnerable population during the last decade.

Determinants of rural non-farm employment

The result of estimated RNF determinant equation is presented in Table 6. The estimated regression model fitted well with the data (R^2 0.67) and model was statistically significant. All the explanatory variables have expected signs and most of them are statistically significant. As expected AgGSDP had a positive influence on the expansion of non-farm activities, regression coefficient indicates, on an average if farm income increase by ₹ 10 000/ha, it would lead to expansion of states' RNFE share by 3.7 percentage points, keeping all other factors constant. It implies that the higher income received from agriculture led to demand for other non-farm activities and also acted as a demand pull factor for RNFE. This result is consistent with the Jha (2006) study where he found that agriculture and non-farm activities have strong positive linkages via input derived demand for agricultural inputs and consumption demand. In our analysis, in order to estimate the demand led growth of RNF, share of non-food expenditure variable was inserted in the model, despite having expected signs, it was not a significant factor. Similarly, education variable was also not having significant influence on RNFE; perhaps it was driven by skill and other entrepreneurship factors.

The past studies highlighted that the relationship between average land holding-size and RNFE per cent share could be both positive and negative. However, our results support the positive relationship and the coefficient is significant and robust. On an average, if average land holding-size increases by one ha RNFE share of the state would increase by 3.6 percentage points. This means that if the farm-size increases above certain level it shall increase the capacity to undertake non-farm activities due to better access to credit and other resources and economic stability of the households support them to enter in non-farm activities. This also shows that consolidation of holdings, as marginal farmers move out and large farmers' access land, due to tenancy or purchase with higher income from RNF sector. As hypothesised the percentage share of SC and ST population in rural areas had negative and significant effect on RNFE status. On an average if SC and ST population share increases, by one per cent, RNFE share would decline by 0.38 percentage points, while keeping other variables constant. It implies socio-economic background of rural populations had determined the selection of occupation and confirms existence of caste-based occupation in rural India. Other important variable infrastructure development comprising per capita electricity consumption and road density has strong and positive effect on the growth of RNFE. The highest, positive and significant regression coefficient of infrastructure index suggests that infrastructure-led growth of RNFE was the strongest. If the index is increased by one point, RNFE share of the state would increase by 14.7 percentage points. It underscores the importance of assured electricity and better road communications. As expected the time dummy variable is significant and positive, it indicates the intercept varies across the time. On an average, the variables (unobserved) which are not included in the model influence the RNFE share of the state to the tune of 10%.

This paper has examined the contribution of agriculture in India's employment and income in the last two decades. It was found that the share of agriculture in the national

Table 5 Occupation-wise distribution of households by land size and social group for rural areas

Category	Self-employed in agriculture			Self-employed in non-agriculture			Agricultural labour			Others		
	1999-00	2004-05	2009-10	1999-00	2004-05	2009-10	1999-00	2004-05	2009-10	1999-00	2004-05	2009-10
Land size group												
Landless	12.2	12.7	11.3	17.5	19.5	19.4	43.5	34.0	33.6	26.9	33.9	35.7
Marginal	62.2	65.8	64.1	6.6	9.3	9.7	19.2	15.2	14.9	12.0	9.7	11.3
Small	77.5	82.5	79.5	3.8	5.0	6.3	9.5	7.2	7.8	9.2	5.3	6.4
Semi medium	86.7	89.8	88.3	3.3	3.7	4.2	2.4	2.3	2.8	7.6	4.2	4.7
Medium and large	90.7	91.7	87.3	2.7	3.4	5.8	0.3	1.1	1.5	6.3	3.8	5.4
All sizes	32.7	35.9	31.9	13.4	15.8	15.5	32.2	25.8	25.6	21.7	22.5	27.0
Social group												
ST	36.2	39.3	37.0	5.2	6.4	7.0	39.7	34.0	33.4	18.9	20.3	22.6
SC	16.4	20.2	17.1	12.0	14.1	13.7	51.4	40.5	36.9	20.2	25.2	32.3
OBC	34.7	38.7	34.1	15.5	17.6	17.2	29.2	22.4	23.3	20.6	21.3	25.4
Others	41.1	43.3	39.4	14.8	18.1	18.1	19.0	15.6	15.9	25.1	23.0	26.6
All classes	32.7	35.9	31.9	13.4	15.8	15.5	32.2	25.8	25.6	21.7	22.5	27.0

Source: As in Table 3.

Table 6 Regression estimates of rural non-farm employment determinant model

Particulars	Coefficients	Std. error
Constant	10.62	15.70
AgGSDP (₹ crore/000'ha)	3.67***	0.96
Land holdings (ha)	3.55*	1.87
Share of SCST population (%)	-0.38**	0.18
Infrastructure index	14.65**	6.85
Rural literacy rate (%)	0.001	0.18
Share of non-food expenditure (%)	0.04	0.34
Time dummy	10.25**	4.61
R^2	0.67	
Adjusted R^2	0.58	

***, ** and * indicates level of significant at 1, 5 and 10% respectively.

employment came down from 64% to 57% only during the last two decades, whereas its share in GDP halved from about 25 to 12.5%. The dependency on agriculture declined for male workers while it reversed for female workers in the recent decade. The state-wise analysis elucidated that growth process of the economy brought significant changes in RNFE and five states have share of more than 40% in 2009-10. During early 2000's, the manufacture sector led RNF growth and in the late 2000's construction was the lead RNFE sector. The change in employment pattern among economically backward class and marginal and small farmers was the cause of concern, as most of them shifted to other labour households in non-farm sector indicating casualization of rural employment. The determinant analysis explained that agriculture productivity, infrastructure development and size of landholding size were the major driving forces which accelerated the growth of RNFE. Therefore, policies and strategies aimed at improving rural non-farm employment should concentrate mainly on the three factors, infrastructure, agriculture productivity and skills of the weaker sections. It is imminent to implement the education and skill development programmes for targeted vulnerable population for enhancing their access to non-farm employment activities. The study also found that agriculture prosperity leads to development of RNFE in rural areas through provision of better employment environment and other linkages. Hence, it is imperative to promote the agriculture research and improve the productivity for not only to develop agriculture sector, but to develop rural non-farm sector and economy as a whole.

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