Ind. Jn. of Agri. Econ.
Vol. 53, No. 2, April-June 1998

ARTICLE

Determinants of Rural Non-Agricultural Employment: The Indian Case

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I

INTRODUCTION

In India, the share of income from agriculture in national income declined from around 50 per cent to 30 per cent in the 50 years since Independence. The share of the labour force in agriculture in total labour force hardly declined until the 1960s and showed only a small decline since the beginning of 1970. The decline since the 1970s gave hopes of a sustained decline in the agricultural labour force and rural non-farm employment as a solution to the problem of unemployment and poverty. The euphoria about rural non-farm employment continued until recent years. There has been little examination of the nature of growth of rural non-farm employment, whether it is growth-led or distress-induced.[1] There is also little examination of the stability of such growth at the all-India and state levels.[2] This paper sets itself the task of such an examination against the background of the current debate on the growth of rural non-farm employment. Besides, it also computes data on rural non-farm employment for several Asian countries for 1970 and 1989 and spells out the conditions under which a rapid shift to rural non-farm employment has been feasible. In Section II it compiles the National Sample Survey (NSS) data for five time points covering 1972-73 to 1993-94 for all-India and states for rural male and total labour force. Finally, in Section III the paper examines the factors influencing the share of rural non-agricultural employment in the Indian context by using cross-sectional NSS data for 1987-88 and 1993-94 and throws light on the issue of distress-induced non-agricultural employment.

Current Debate on Growth of Rural Non-Agricultural Employment

Simon Kuznets, in his path breaking empirical work, while analysing modern economic growth of the present-day developed countries observed that in all cases of successful and sustained economic growth the share of agriculture in labour force and in Gross Domestic Product (GDP) declined. The reasons for this decline are partly due to the supply-side effects of the improvements in labour productivity in the economy as a whole as well as in the agricultural sector with appropriate sectoral leads and lags, and partly on the demand side because of the operation of the Engel's Law resulting in slower growth in demand for food

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The authors acknowledge with thanks the suggestions made by the referee for the improvement of the paper.

compared to that of non-agricultural products and services. These historical findings are entirely consistent with Adam Smith's theorising but run counter to the pessimism of Ricardo and Malthus (Chaudhri, 1993, p. 169).

In developing countries including India, the production structure changes did not match the workforce changes (Bhalla, 1997, p. 150). Since the 1970s, the growth of rural non-farm employment has begun to be seen as a solution to the problem of rural unemployment and poverty. The growth of rural non-farm employment has been increasingly attributed to the production and consumption linkages that agricultural growth created under the impetus of green revolution. But experience in the developing countries, including India, has shown that backward linkages have not been adequately operative. Forward linkages in terms of generation of employment in processing industries were prominent. But even these failed to generate employment adequately in the context of displacement of workers in traditional industries by modern processing industries.[3] Therefore, consumption demand-induced linkages are considered the main factors fostering intersectoral relationships, since with the rise in the incomes of producers, a greater part is spent on non-agricultural goods and services, which stimulates production and employment in these activities.

Experience of Asian Countries with Growth of Non-Agricultural Employment

In developing countries which have recorded rapid alleviation of rural poverty such as Korea, there was a rapid shift of labour force from agriculture to non-agriculture. Table 1 shows the rate of growth of gross domestic product (GDP) originating in agriculture for 13 countries at different stages of development along with the trends in share of agriculture. The share of agriculture in total labour force has shown a steep decline between 1970 and 1989 in countries recording high annual growth rate of GDP at factor cost. South Asian countries, viz., India, Pakistan, Sri Lanka and Nepal show only a low rate of decline between the two periods. In these countries the growth rate of GDP was 4.2 per cent or less except in Pakistan, while in countries recording fast decline, the growth rate exceeded 6 per cent. The correlation between the two sets of figures, i.e., share of agriculture in total labour force and annual growth rate of GDP at factor cost, is -0.75 and is statistically significant.

TABLE 1. SECTORAL SHARE OF AGRICULTURAL LABOUR FORCE IN SELECTED ASIAN COUNTRIES

Country	Share in agriculture			Annual growth rate 1968 to 1989		Growth of land productivity in agriculture at constant prices	Growth of labour productivity in agriculture at constant prices
	1970	1989	Difference	GDP at factor Cost	GDP agriculture		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1. South Korea	48.2	19.0	-29.2	8.5	2.3	3.71	3.78
2. China	78.3	60.5	-17.8	7.6*	4.4*	4.25	4.71
3. Japan	17.4	7.6	-9.8	4.5*	-0.5*	1.35	4.14
4. Indonesia	66.3	54.3	-12.0	7.5*	4.0	1.93	2.03
5. Malaysia	46.4	28.3	-18.1	6.3#	4.1#	3.32	4.26
6. Thailand	71.8	64.2	-7.6	6.9	4.1	1.07	1.68
7. Philippines	51.5	41.1	-10.4	3.9	3.7	2.69	1.49
8. India	71.7	68.0	-3.7	4.1	2.4	1.90	0.64
9. Pakistan	55.9	51.1	-4.8	5.7	3.7	3.35	2.18
10. Sri Lanka	55.3	50.0	-5.3	4.2	3.0	3.31	1.87
11. Bangladesh	81.4	71.0	-10.4	3.3	2.0	2.40	0.69
12. Nepal	93.6	93.0	-0.6	2.9	2.1	1.58	0.13
13. Australia	8.1	5.3	-2.8	3.0	3.3*	0.78	1.89

Sources: Chaudhri, 1993, pp. 171 and 185, Tables I and II.
Note: * Period 1968 to 1988 only. # 1970-1989.

But the GDP in agriculture is not well correlated with the share of agriculture in total labour force though it also yields expected negative relation. The reasons for low correlation between GDP in agriculture and the share of agriculture in total labour force may be because of the inclusion of Australia and Japan in which industry grows autonomously. For this reason, we computed correlation between the share of agriculture by excluding Australia and Japan. This increased the value of the coefficient though the coefficient is not still statistically significant.

The growth rate of land productivity is a measure of agricultural performance. This is related to the share of agriculture in total labour force. This yielded a correlation coefficient of -0.6108. The value of the coefficient however is lower than the corresponding value for labour productivity, i.e., -0.7083. This is understandable since labour productivity in agriculture results in high marketed surplus which is used to promote non-agricultural activities. In the countries which experienced rapid decline in the share of agriculture it is plausible that the following factors contributed to shifts in agricultural labour force to non-agriculture.

1. A consistently high rate of overall agricultural growth;
2. Technology which facilitates high employment for a given output;
3. A broad-based agricultural growth generating demand for non-agricultural goods;
4. Infrastructural development which facilitates location of non-agricultural industries in adjacent towns to enable rural people to commute for employment in the towns.

In the absence of these conditions, the observed rise in non-agricultural employment tends to be distress-induced (Vaidyanathan, 1986; Unni, 1991; Eapen, 1995; Saith, 1991; Chandrasekhar, 1993; Bhalla, 1993 a, b). Vaidyanathan was one among the earliest writers who pointed out that non-agricultural sector could be a residual sector but in a later study he revised his opinion in the context of observed rise in rural wage rates for agricultural labour as well as non-agricultural labour. He finds that the increase in real wage rates between 1977 and 1987 ranged from 21 per cent in the case of casual non-agricultural workers in urban areas to 85 per cent for regular agricultural workers in rural areas (Vaidyanathan, 1994, p. 3155). Jeemol Unni in a recent review of employment and wages among rural labourers finds that the tendency of real wage rates to rise observed in the mid-1970s to the mid-1980s is not sustained in the agricultural and non-agricultural sectors. Real wage rates in agriculture have tended to stagnate, those in non-agriculture have tended to decline in the 1990s (Unni, 1997, p. 69). She concludes that the current euphoria with the observed shift of the workforce to the non-agricultural sector might not be well founded. The 'infamous distress hypothesis' may not be quite well and truly buried yet (Unni, 1997, p. 71).

II

INDIAN EXPERIENCE AND POOR GROWTH RATE OF NON-AGRICULTURAL EMPLOYMENT

Trends in the Share of Non-Agriculture in Total Workforce as seen from NSS Rounds

In India none of the factors cited as conditions of decline in the share of agriculture has been operative so far. The GDP has been growing at less than 5 per cent; the GDP in agriculture has been growing at less than 3 per cent; ineffective implementation of land reforms did not facilitate broad based agricultural development; capital intensive technology

within agriculture has reduced employment elasticity of output. Therefore, even though there was a decline in the share of contribution of agriculture to national income, there was no decline in the share of labour force in agriculture until 1970. Even after two decades of Independence the share of agriculture in labour force continued to be around 70 per cent as in 1971. There was a decline in the 1970s by 3 per cent; there was a further decline in the eighties by another 2 per cent, resulting in the percentage share of agriculture being reduced to 65 per cent. Such a decline in the share of agriculture and the corresponding increase in the share of non-agriculture inspired hopes of sustaining growth of non-agriculture.

There are two alternative sources of data, viz., (1) the Decennial Population Census and (2) the National Sample Survey Organisation (NSSO) data, for an examination of trends in the share of non-agriculture in the total workforce. Of the two, the NSSO data are chosen for the analysis in preference to the decennial demographic census for two reasons: (a) comparability of data is better with the NSSO data and (b) the NSSO investigation yields more reliable data than the Census in which the census investigator spends hardly a few minutes with each household.[4]

The NSSO presents the data separately for Usual Status Principal Workers and Usual Status Principal and Subsidiary Status Workers (PS and SS). Thus the NSSO also covers Marginal Workers. In this analysis we include the Usual Status Principal and Subsidiary Workers for Rural, and Rural + Urban areas. The Rural, and Rural + Urban data are presented in Table 2. We present the trends of workers in rural areas by residence and all areas shown separately. In each of the two areas we present the data for all persons, and for males and females separately. The differences in the percentages between one round and the preceding round of NSS are presented for examination of the trend, whether upward or downward. The percentage share of All (PS + SS) Rural Male Workers shows an increase up to 1987-88. But between 1987-88 and 1993-94, the share of rural male workers remained almost stagnant. As a result, the share of rural all non-agricultural workers has risen by 7.2 per cent only in the two decades (1972-73 to 1993-94). The percentage share of rural females (PSFW) has recorded even lower growth during the past two decades. In the two decades the Principal + Subsidiary Status Female Workers in the NSS increased only by 3.5 per cent as against a corresponding increase of 9.2 per cent for males and the share of rural female workers in non-agriculture declined between 1987-88 and 1993-94. In urban areas the female workers improved their employment growth record by impressive margins. The sagging performance for the rural female workers in recent years is, thus, a cause of worry (Chadha, 1997, p. 189).

In all-India (rural + urban), the total male workers (PS + SS) rose by 1.6 percentage points which is higher than the corresponding share in the rural areas. Even total female workers showed a rise of 6.6 per cent between the two decades. But even in this case between 1987-88 and 1993-94, the share of non-agricultural workers in the total remained the same and showed a slight increase for males (see Table 2).

To sum up, the percentage share of non-agriculture in total workers declined after 1987-88. Except for community and personal services among non-farm activities and agriculture, the employment growth slackened in every branch of economic activity, as far as rural male workers are concerned. In construction employment grew negatively. The growth deceleration was far more serious in the case of rural female workers (Chadha, 1997, p. 188). The decline was more perceptible in the case of females than males.

TABLE 2. TRENDS IN THE SHARE OF NON-AGRICULTURAL WORKERS IN TOTAL WORKFORCE: ALL-INDIA RURAL AND TOTAL (PS and SS)

(per cent)

Year	National Sample Survey											
	Rural						Rural + Urban					
	Persons	Per cent difference	Male	Per cent difference	Female	Per cent difference	Persons	Per cent difference	Male	Per cent difference	Female	Per cent difference
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1972-73	14.4	-	16.7	-	10.3	-	26.1	-	31.2	-	15.7	-
1977-78	16.6	2.2	19.3	2.6	11.8	1.5	29.0	2.9	34.4	3.2	18.2	2.5
1983	18.5	1.9	22.2	2.9	12.2	0.4	31.4	2.4	37.4	3.0	18.8	0.6
1987-88	21.7	3.2	25.4	3.2	15.8	3.6	35.0	3.6	41.3	3.9	22.3	3.5
1993-94	21.6	-0.1	25.9	0.5	13.8	-2.0	35.5	0.5	42.0	0.7	22.3	-
Difference between												
1972-73 to 1987-88	-	7.3	-	8.7	-	5.5	-	8.9	-	10.1	-	6.6
1972-73 to 1993-94	-	7.2	-	9.2	-	3.5	-	9.4	-	10.8	-	6.6

Sources: Visaria, 1995, p. 402; NSSO, 1990; Government of India, 1996.

Note: In a recent review based on census data of 1961 to 1981, Sheila Bhalla notes: "In India taken as a whole the share of non-agriculture in the total workforce recovered to better than 1961 levels by 1981, but in rural areas it did not. This implies that a substantial part of the recent workforce shift out of agriculture involved a shift to urban areas" (Bhalla, 1997, p. 148).

Rate of Growth of Non-Agricultural Workers in India

The rates of growth of non-agricultural workers in rural areas and rural + urban areas are shown separately for agriculture and non-agriculture (Table 3). The rate of growth of non-agricultural workers has shown a declining trend particularly between 1987-88 and 1993-94. The rate of growth of rural non-agricultural workers (RGW Non-AG) which was 5.07 per cent per annum between 1972-73 and 1977-78 went down to 0.33 per cent between 1987-88 and 1993-94. There was a sharp decline in the RGW Non-AG from 4.39 per cent between 1983 and 1987-88 to 0.33 per cent between 1987-88 and 1993-94. The decline in the rate of growth was not restricted only to non-agriculture, it could be seen even in agricultural workers. What should be of concern is that the rate of growth of agricultural workers between 1987-88 and 1993-94 showed a steep decline despite the fact that this period is marked by a higher rate of growth of agricultural production at 4.66 per cent per annum, suggesting steeply declining elasticity of employment to output of agriculture.

TABLE 3. ANNUAL RATE OF GROWTH OF WORKFORCE (PERSONS) (PRINCIPAL AND SUBSIDIARY STATUS WORKERS), ALL-INDIA

	Rural				Rural + Urban				
	Agriculture		Non-agriculture		Agriculture		Non-agriculture		Share of non-agriculture in total workers (per cent)
Year	Persons (million)	Rate of growth (per cent)	Persons (million)	Rate of growth (per cent)	Persons (million)	Rate of growth (per cent)	Persons (million)	Rate of growth (per cent)	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1972-73	169.1	-	28.5	-	174.9	-	61.8	-	26.1
1977-78	183.5	1.64	36.5	5.07	190.9	1.77	77.9	4.74	29.0
1983	198.9	1.62	45.1	4.32	207.6	1.69	98.2	4.09	32.1
1987-88	201.8	0.28	55.9	4.39	210.9	0.82	113.8	3.63	35.0
1993-94	202.4	Neg.	57.0	0.33	210.7	Neg.	115.8	0.29	35.4
1993-94 over 1983	-	0.17	-	2.36	-	0.15	-	1.66	-

Sources: Visaria, 1995, p. 402; Government of India, 1996.

The rate of growth of workers in all-India (rural + urban areas) showed a continuously declining trend. The decline was the steepest between 1987-88 and 1993-94 both in agriculture and non-agriculture. As a consequence of the trend decline in growth rates of non-agriculture, the share of non-agriculture in the overall economy which rose from 26.1 per cent in 1972-73 to 35 per cent in 1987-88 showed almost a stagnation at 35.4 per cent in 1993-94 (see Table 3).

Instability in Non-Agricultural Workforce

The non-agricultural workforce within rural areas was marked by not only poor rates of growth but whatever growth was there, it was highly unstable marked by fluctuations from year to year. We present the statewise shares of non-agricultural workers for men only (Table 4). Eight states, viz., Haryana, Himachal Pradesh, Karnataka, Maharashtra, Punjab,

TABLE 4. PERCENTAGE OF NON-AGRICULTURAL WORKERS IN RURAL WORKFORCE (PS+SS)

(for men only)

State	1972-73	1977-78	1983	1987-88	1993-94	Percentage change between				
						1977-78 over 1972-73	1983 over 1977-78	1987-88 over 1983	1987-88 over 1977-78	1993-94 over 1987-88
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Andhra Pradesh	21.4	19.7	25.6	25.90	24.4	-1.7	5.9	-0.3	6.2	-1.5
Bihar	17.8	16.9	18.7	20.00	18.0	-0.9	1.8	1.3	3.1	-2.0
Gujarat	16.1	15.6	21.1	31.40	28.9	-0.5	5.5	10.3	15.8	-2.5
Haryana	19.9	22.5	27.8	29.10	39.1	2.6	5.3	1.3	6.6	10.0
Himachal Pradesh	18.9	22.6	22.9	31.30	34.2	3.7	0.3	8.4	8.7	2.9
Karnataka	14.8	16.8	18.4	20.40	21.2	2.0	1.6	2.0	3.6	0.8
Kerala	44.3	40.8	42.2	45.80	46.8	-3.5	1.4	3.6	5.0	1.0
Madhya Pradesh	9.6	10.8	12.8	14.70	12.8	1.2	2.0	1.9	3.9	-1.9
Maharashtra	17.6	19.6	20.4	24.20	24.7	2.0	0.8	3.8	4.6	0.5
Orissa	18.4	15.4	21.8	25.10	21.3	-3.0	6.4	3.3	9.7	-3.8
Punjab	20.6	22.2	22.5	31.20	31.9	1.6	0.3	8.7	9.0	0.7
Rajasthan	15.6	17.5	19.0	34.80	30.4	1.9	1.5	15.8	17.3	-4.4
Tamil Nadu	24.6	26.1	31.1	34.80	36.0	1.5	5.0	3.7	8.7	1.2
Uttar Pradesh	18.1	19.8	21.3	21.10	23.7	1.7	1.5	-0.2	1.3	2.6
West Bengal	22.1	22.3	26.9	27.80	35.3	0.2	4.6	0.9	5.5	7.5
All-India	19.3	19.5	22.4	25.50	25.9	0.2	2.9	3.1	6.0	0.4

Sources: Unni, 1991, p. 110; NSSO, 1990; Government of India, 1996.

Notes: Sheila Bhalla's (1997, p. 154) analysis of census data shows that only six states have experiecned a significant enhancement in levels of rural secondary sector diversification over the entire period (1961-81). They were: Bihar, Haryana, Maharashtra, Orissa, Rajasthan and West Bengal - a rather mixed bag.

Tamil Nadu, Uttar Pradesh and West Bengal showed a continuously rising trend while seven states, namely, Andhra Pradesh, Bihar, Gujarat, Kerala, Madhya Pradesh, Orissa and Rajasthan showed a declining trend of growth. When the data are examined for males and females together (see Table 5) for rural areas only, five states, namely, Himachal Pradesh, Karnataka, Kerala, Maharashtra and West Bengal alone showed a continuous rise. The states of Punjab, Tamil Nadu, Uttar Pradesh, Haryana, which showed a rising trend only when males are considered, recorded a fluctuating trend when males + females are considered. The state of Kerala which recorded a fluctuating trend when males alone are considered gets included in the group of rising trend when males + females are considered together. It may be seen that one-third of the states alone showed a stable growth in the share of non-agricultural workers when males + females are considered.

Even when all areas (rural + urban) and all workers (males + females) are considered for stability of the growth in the share of non-agriculture workers, in only eight states, Haryana, Himachal Pradesh, Karnataka, Kerala, Maharashtra, Punjab, Uttar Pradesh and West Bengal a continuously rising trend is observed. But seven others among the major states showed a fluctuating trend. The drought of 1987-88 has increased the share of non-agricultural workers in Gujarat and Rajasthan in particular.

TABLE 5. PERCENTAGE OF NON-AGRICULTURAL WORKERS (PRINCIPAL AND SUBSIDIARY STATUS), RURAL, AND RURAL + URBAN: MALES + FEMALES

State	Percentage of non-agricultural workers (NAW)									Percentage difference of NAW between rural, and rural + urban
	Rural				Rural + Urban				Degree of urban-isation	
	1977-78	1983	1987-88	1993-94	1977-78	1983	1987-88	1993-94	1987-88	1987-88
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Andhra Pradesh	17.6	22.8	22.4	20.7	30.54	33.43	34.3	33.0	26.38	11.90
Bihar	15.3	16.5	17.2	15.7	23.00	24.62	24.9	23.5	14.53	7.70
Gujarat	13.0	15.4	28.5	21.3	35.11	33.57	44.2	42.1	33.34	15.70
Haryana	18.3	22.3	21.4	28.1	30.13	32.72	37.9	45.2	25.66	16.50
Himachal Pradesh	12.2	12.9	18.0	19.7	17.88	17.18	21.1	23.6	8.05	3.10
Karnataka	15.2	15.8	18.1	18.8	33.13	30.26	34.1	35.6	32.61	16.00
Kerala	34.6	36.9	41.5	43.6	44.08	46.52	48.1	52.4	20.79	6.60
Madhya Pradesh	8.6	10.0	12.3	10.2	23.04	20.41	24.8	23.5	23.62	12.50
Maharashtra	14.2	14.3	17.1	17.4	38.67	35.44	37.9	40.4	37.88	20.80
Orissa	15.0	20.9	24.1	19.1	21.99	29.32	31.8	26.8	14.84	7.70
Punjab	18.5	17.5	23.5	25.3	35.71	36.27	39.8	45.7	31.02	16.30
Rajasthan	11.6	13.3	26.6	20.1	24.18	25.47	36.0	31.6	23.89	9.40
Tamil Nadu	22.0	25.4	29.6	29.5	41.26	43.62	46.7	46.1	34.89	17.10
Uttar Pradesh	17.3	18.0	17.7	20.0	29.21	29.13	30.1	31.6	21.47	12.40
West Bengal	24.4	26.4	28.2	36.7	42.20	43.15	45.5	53.8	27.79	17.30
All-India	16.7	18.6	27.8	21.6	29.00	32.44	35.8	36.6	26.05	8.00

Sources: Unni, 1991, p. 110; NSSO, 1992; Government of India, 1996.

Evidence on Drought-Induced Non-Agricultural Growth in Employment

The major states are divided into two groups: Group I States showing positive rates of growth between 1977-78 and 1987-88 and Group II States showing negative rates of growth in the same period. The relationship between the rate of growth of foodgrains production and the difference in the share of non-agricultural workers in rural workforce between 1977-78 and 1987-88 could be seen from the data (see Table 6). Gujarat recorded the highest negative rate of growth for foodgrains production. It also recorded the highest difference in the share of non-agricultural workers between 1977-78 and 1987-88. Similarly, Rajasthan recorded the second highest negative rate of growth of foodgrains production and also showed the second highest positive difference in the share of non-agricultural workers between the two years. This relationship is seen not only for males but also for males + females together. During a period of drought, as agricultural employment declines, people shift to non-agricultural activity out of a sense of distress. Therefore, the difference in the share of non-agricultural workers rises during the drought period. In this period there were only four states within the group recording a positive rate of growth of agricultural production, namely, Punjab, Haryana, Madhya Pradesh and West Bengal which showed a high percentage difference in the share of non-agricultural workers between 1977-78 and 1987-88. Even the average difference in the share of non-agricultural workers between

1977-78 to 1987-88 for states with positive rates of growth has fallen below the corresponding share of these states with negative rates of growth. The hypothesis that as the share of foodgrain production falls due to a serious drought there will be a distress-induced shift of high order to non-agriculture gets validated. Such shifts swamp the shifts observed due to agricultural growth linkages in such of the states as Punjab and Haryana. The negative correlation coefficients between growth rates of foodgrains and difference in the share of non-agricultural workers between 1977-78 and 1987-88 for both males (-0.72**) and males + females (-0.84**) strengthen the above observations.

TABLE 6. ANNUAL COMPOUND GROWTH RATE OF FOODGRAINS PRODUCTION AND THE DIFFERENCE IN PERCENTAGE SHARE OF NON-AGRICULTURAL WORKERS BETWEEN 1987-88 OVER 1977-78

State	Annual rate of growth of foodgrains production between 1977-78 and 1987-88	Difference in the percentage share of non-agricultural workers between 1977-78 and 1987-88	
		Males	Males + Females
(1)	(2)	(3)	(4)
I. States showing positive rate of growth of foodgrains production			
1. Andhra Pradesh	0.98	6.2	4.8
2. Haryana	4.14	6.6	3.1
3. Madhya Pradesh	2.22	3.9	6.9
4. Maharashtra	0.57	4.6	2.9
5. Punjab	5.12	9.0	5.0
6. Uttar Pradesh	4.16	1.3	0.4
7. West Bengal	1.40	5.5	3.8
Average	2.66	5.3	3.84
II. States showing negative rate of growth of foodgrains production			
1. Bihar	-0.70	3.1	1.9
2. Gujarat	-9.86	15.8	15.5
3. Himachal Pradesh	-2.00	8.7	5.8
4. Karnataka	-1.37	3.6	2.9
5. Kerala	-2.10	5.0	6.9
6. Orissa	-1.02	9.7	9.1
7. Rajasthan	-7.41	17.3	15.0
8. Tamil Nadu	-0.18	8.7	7.6
Average	-3.08	8.99	8.09

Sources: NSSO, 1992; CMIE, 1995.

III

CROSS-SECTIONAL ANALYSIS OF DATA OF STATES: 1977-78, 1987-88 AND 1993-94

Share of Non-Agriculture, Rate of Growth of Foodgrains Production and Incidence of Rural Poverty

The year 1993-94 was a better agricultural year in which the rate of growth of agricultural production was as high as 4.66 per cent. Even in comparison with 1983 the rate of growth was more than the trend rate of growth and exceeds the rate of growth of labour force. We expect linkage effects of agriculture to produce a positive difference in the share of non-agriculture between 1983 and 1993-94. We fitted a regression on the difference in the share

of non-agricultural workers between the two periods. The independent variables chosen were the rate of growth of foodgrains production, rural poverty and dummy for states recording higher growth rate of foodgrains production than the growth rate of labour force equal to one and otherwise zero (Table 7). In this case the sign of regression coefficient for rate of growth of foodgrains production was positive but not statistically significant, suggesting absence of relation between the two variables. The regression coefficient of poverty and dummy value for differences in the states with rates of growth exceeding the rate of growth of labour force and falling below the growth of labour force were both negative and statistically significant. We noted earlier (Sen, 1997) that the regression coefficient of poverty was negative not because of growth of non-agricultural employment but because of the rise in public expenditure.[5]

TABLE 7. REGRESSIONS OF DIFFERENCE IN THE SHARE OF NON-AGRICULTURAL ALL WORKERS IN RATE OF GROWTH OF FOODGRAINS PRODUCTION AND INCIDENCE OF RURAL POVERTY

$$Y_1 = 12.04 - \underset{(4.37)}{0.81\, X_1^{**}} - \underset{(2.26)}{0.11\, X_2^{*}}$$

$R^2 = 0.66$ $F = 11.64^{**}$

$$Y_2 = 8.14 - \underset{(5.82)}{0.92 X_1^{**}} \underset{(1.36)}{- 0.05\, X_2}$$

$R^2 = 0.74$ $F = 17.53^{**}$

$$Y_3 = 12.93 + \underset{(0.20)}{0.007\, X_3} - \underset{(3.22)}{0.21\, X_4} - \underset{(2.36)}{1.12\, D^{**}}$$

$R^2 = 0.39$ $F = 3.96^{*}$

Y_1 = Difference in the share of non-agricultural workers (for men only) between 1977-78 and 1987-88.
X_1 = Rate of growth of foodgrain production between 1977-78 and 1987-88.
X_2 = Incidence of rural poverty in 1977-78.
Y_2 = Difference in the share of non-agricultural workers (rural male + female) between 1977 and 1987-88.
Y_3 = Difference in the share of non-agricultural workers (for male female, rural + urban) between 1983 and 1993-94.
X_3 = Rate of growth of foodgrains production between 1983 and 1993-94.
X_4 = Incidence of rural poverty in 1983.
D = Dummy variable = 1 higher growth in foodgrains production than the growth of rural population and = 0 otherwise.

* and ** Significant at 5 and 1 per cent level respectively.

Urbanisation and Share of Non-Agricultural Employment

The declining rate of growth of urbanisation has evidently contributed to the slackening of the rate of growth of non-agriculture in all-India rural + urban. In Korea it is the pace of urbanisation that has contributed to rapid growth of non-agriculture. In India, the growth of urbanisation has been slow and in the 1980s, there was a further slackening of urbanisation.

The share of non-agricultural employment as in 1987-88, i.e., rural + urban, is compared with the corresponding share for the rural and the difference between two sets of figures is noted (Table 5). There is a high correlation as expected between this difference and urbanisation, defined as the share of urban population in total population. The correlation coefficient is 0.917, thus suggesting that the degree of urbanisation influences the magnitude

of non-agricultural workers overall. When the urbanisation slackens, the share of non-agricultural workers declines. But the more important relationship pertains to urbanisation and rural non-farm employment. When a regression is fitted between degree of urbanisation and rural non-farm employment, the correlation coefficient is found to be very low and statistically insignificant, suggesting that the degree of urbanisation of a district had little influence on rural non-farm employment.[6]

The percentage of non-agricultural employment is related to six independent variables, namely, (1) gross value of agriculture per worker, (2) current daily status of unemployment of males, (3) percentage area under non-foodgrains (a proxy for commercialisation), (4) infrastructure index, (5) average money wage rate for males and (6) incidence of rural poverty (Table 8).

TABLE 8. VALUES OF INDEPENDENT VARIABLES FOR ALL STATES, 1987-88

State	Average money wage rate for males 1984-85 (Rs.)	Per cent of people below poverty 1987-88	Gross value per agricultural worker 1987-88 (Rs.)	Infrastructure index 1987-88	Per cent area under non-foodgrains	Current daily status unemployment rate	Gross value per hectare 1987-88 (Rs.)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Andhra Pradesh	10.41	20.92	3,453	96.16	37.70	3.30	5,068
Bihar	9.88	52.63	3,439	58.67	9.60	2.30	6,265
Gujarat	12.58	28.67	3,022	113.78	51.50	3.20	2,148
Haryana	19.35	16.22	11,929	158.88	32.00	4.70	6,357
Himachal Pradesh	12.55	16.28	4,231	118.89	10.90	2.80	4,886
Karnataka	7.31	32.82	5,029	147.63	37.90	1.10	4,112
Kerala	16.86	29.10	9,281	151.14	78.00	7.50	9,560
Madhya Pradesh	8.53	41.92	3,777	95.85	21.80	1.60	2,876
Maharashtra	9.46	40.78	4,429	130.92	32.00	1.70	3,621
Orissa	8.42	57.64	3,784	68.09	26.00	2.70	2,943
Punjab	18.13	12.60	17,383	229.33	27.70	2.10	7,503
Rajasthan	12.63	33.21	4,681	89.08	32.00	4.00	3,000
Tamil Nadu	8.83	45.80	3,599	140.90	40.60	5.60	6,812
Uttar Pradesh	10.54	41.10	5,002	99.28	19.10	2.00	5,599
West Bengal	10.59	48.30	6,457	99.11	24.80	2.60	7,569

Sources: Jose, 1988, p. 48; NSSO, 1990, p. 101; Government of India, 1991, p. 132; 1993 a, p. 187; 1993 b, p. 40.

The regressions are run for 1987-88 and 1993-94 separately for rural males and persons to judge the stability of the coefficients derived. Because of multicollinearity, we have chosen only a few of the variables for fitting the regression equation. The independent variables chosen are (i) area under non-foodgrains, (ii) gross value per hectare,[7] (iii) current daily status of unemployment and (iv) labour productivity. Incidence of poverty could not be taken as a separate variable since it is highly correlated with the gross value per hectare.

Results of Regression: 1987-88

A regression is run for 1987-88 with three independent variables, namely, gross value of agricultural production per hectare (GVH 88), percentage of area under non-foodgrains (ANF 88) and current daily status unemployment (CD). For rural males current daily status unemployment is found to be the only statistically significant variable, suggesting that non-agricultural employment is becoming a residual sector but in the context of declining wage rate in the nineties it would also suggest distress-induced growth of non-agricultural employment. For rural persons as a whole, the percentage of area under non-foodgrains, in addition to current daily status of unemployment, which was significant at 10 per cent level, was also found to be significant at 5 per cent level. But what is important is in both the equations gross value of agricultural production per hectare is not statistically significant.

Rural Males:

$$\text{NA 88} = 14.05 + \underset{(0.88)}{0.086\ \text{ANF}} + \underset{(2.77)}{3.038\ \text{CD}^*} + \underset{(0.43)}{0.00028\ \text{GVH}}$$

$$R^2 = 0.7433$$

Rural Persons:

$$\text{TNA 88} = 8.36 + \underset{(2.42)}{0.197\ \text{ANF}^*} + \underset{(1.95)}{1.77\ \text{CD}^\dagger} + \underset{(0.99)}{0.00053\ \text{GVH}}$$

$$R^2 = 0.7991$$

* and † Significant at 5 and 10 per cent level respectively.

Results of Regression: 1993-94

For judging the stability of results of 1987-88 we ran similar regression for 1993-94 (Table 9). The following are the results. Current daily status of unemployment which was significant in 1987-88 data was not significant in 1993-94 data, suggesting that the role of distress-induced employment declined in 1993-94.

The results for gross value per hectare were better in 1993-94 than in 1987-88, though it was statistically significant only at 10 per cent level for males and at 5 per cent level for males + females together. The values for commercialisation for males were not significant both in 1987-88 and 1993-94. This result is quite consistent with the findings of Sheila Bhalla (1997) that agricultural growth contributed to less diversification in the later period as compared to the earlier period.[8]

TABLE 9. VALUES OF VARIABLES FOR 1993-94

State	Per cent of non-agricultural workers		Current daily status unemployment rate		Per cent area under non-food-grains	Gross value per hectare (average value of yield per hectare) (Rs.)	Male workers pro-ductivity (Rs.)
	Male	Male + Female	Male	Persons			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Andhra Pradesh	24.4	20.7	3.6	2.5	43.67	9,391	9,293
Bihar	18.0	15.7	3.2	1.9	10.64	5,678	2,934
Gujarat	28.9	21.3	3.4	2.4	56.48	7,460	10,807
Haryana	39.1	28.1	3.5	2.0	35.70	10,129	21,871
Himachal Pradesh	34.2	19.7	1.4	0.8	11.22	5,196	6,045
Karnataka	21.2	18.8	2.7	2.0	41.97	6,970	11,016
Kerala	46.8	43.6	6.9	5.1	81.13	15,626	16,830
Madhya Pradesh	12.8	10.2	1.4	1.1	27.41	4,773	8,556
Maharashtra	24.7	17.4	2.4	1.9	34.16	5,177	9,758
Orissa	21.3	19.1	4.1	2.5	26.09	5,979	6,278
Punjab	31.9	25.3	1.5	0.9	24.80	13,597	26,967
Rajasthan	30.4	20.1	0.8	0.5	37.65	3,715	9,090
Tamil Nadu	36.0	29.5	7.4	5.8	42.84	14,074	10,943
Uttar Pradesh	23.7	20.0	1.5	1.0	22.30	8,656	7,773
West Bengal	35.3	36.1	4.7	3.0	27.10	9,958	7,808

Sources: Bhalla and Singh, 1997, p. A-4; Government of India, 1996, pp. 83-84; Sawant, 1997, p. 361.

Rural Males:

$$\text{RMNA 93} = 13.19 + \underset{(0.76)}{0.102\,\text{ANF 92}} + \underset{(0.05)}{0.06819\,\text{CDRM}} + \underset{(1.90)}{0.00137\,\text{GVH}^{\dagger}}$$

$$R^2 = 0.4986$$

Rural Persons:

$$\text{TNA 93} = 6.52 + \underset{(0.78)}{0.0802\,\text{ANF 92}} + \underset{(0.57)}{0.821\,\text{CDT}} + \underset{(2.64)}{0.00142\,\text{GVH}^{*}}$$

$$R^2 = 0.6895$$

* and † Significant at 5 and 10 per cent level respectively.

We also fitted a regression on proportion of non-agricultural workers as dependent variable and male worker productivity (MVP), area under non-foodgrains and current daily status unemployment as independent variables. The regression coefficient showed that labour productivity is statistically insignificant, suggesting that changes in labour productivity are not translated into changes in non-farm employment possibly because of low surplus above subsistence level and weak production-consumption linkages. When total males + females are taken together, current daily status unemployment value is found to be statistically significant, suggesting that non-agricultural sector is a residual sector but whether it is distress-induced or not depends upon the changes in real wage rates in agriculture and in non-agriculture (Vaidyanathan, 1994, p. 3155; Jeemol Unni, 1997, pp. 69-70).

Rural Males:

$$\text{RMNA 93} = 13.33 + \underset{(1.98)}{6.4014\text{ E - 04 MWP}} + \underset{(1.64)}{1.95\text{ CDM}} + \underset{(0.38)}{5.3097\text{ E - 02 ANF}}$$

$$R^2 = 0.5094$$

Rural Persons:

$$\text{TNA 93} = 8.84 + \underset{(1.75)}{0.0005\text{ MWP}} + \underset{(2.42)}{3.36\text{ CDT}} + \underset{(0.32)}{0.04\text{ NF}}$$

$$R^2 = 0.6895$$

where CDT is current daily status unemployment rate of persons.

* Significant at 5 per cent level.

CONCLUSIONS

There has been euphoria about non-agricultural growth in employment based on data of 1977-78 and 1987-88. The latter period, i.e., 1987-88, was marked by drought resulting in less employment in agriculture and a distress shift to non-agriculture. The inclusion of the data for 1993-94, 50th Round of NSS, shows that despite high growth of agriculture, between 1987-88 and 1993-94 the share of non-agriculture in total workforce remains stagnant. This could be attributed mainly to the ineffective translation of agricultural output into employment and inadequate translation of access of agricultural growth into non-agricultural employment.

An analysis of statewise data on growth rates of non-agriculture shows high degree of instability. Only eight out of fifteen states, namely, Haryana, Himachal Pradesh, Karnataka, Maharashtra, Punjab, West Bengal, Tamil Nadu and Madhya Pradesh showed consistently positive growth rates when rural males alone are considered. When males + females are taken together only five states showed stable growth of non-agricultural workers. When rural males alone are considered, the most significant explanatory variable turns out to be current daily status unemployment, suggesting distress-induced growth of non-agriculture.

The analysis of this paper brought out some fresh insights into the problem. Though the problem has been studied by a number of scholars earlier, it calls for exploring the potential of agriculture for generating employment by increasing capital investment in land particularly on small farms and in the eastern part of India by shifting to high value, high employment crops, and export crops. The earlier inferences, based on the data on 1977-78 and 1987-88, regarding low potential of employment of agriculture was misplaced. The inference from 1993-94 data which suggests low rate of growth of employment within agriculture despite high growth of output should not be construed to mean that Indian agriculture has low employment potential. What it indicates is that policy measures are needed to translate output into employment by promoting larger investment in land, both public and private, particularly by small farmers.

Received May 1997. *Revision accepted June 1998.*

NOTES

1. Visaria did not examine in-depth a drought-induced distress decline in the share of agriculture in the workforce, though he distinguishes between a component of the secular trend and also some impact of transient factors in contributing to decline in the share of agriculture in the workforce (Visaria, 1994, p. 85).

2. In recent years, Chadha surveyed distribution of workforce for the same period 1972-73 and 1993-94 but he did not examine the stability of the share of non-agricultural employment over a period (Chadha, 1997, p. 198).

3. Issac *et al.* bring out the need for appropriate technology in the context of modernisation and displacement of labour. They say that the introduction of machinery would raise productivity and improve the prospects of successive innovations and thus would further increase in productivity. Without a compensatory increase in the production capacity, however, the rise in productivity would also tend to displace a part of the labour force. In a growing economy this would involve only a temporary dislocation, as the labourers would be re-employed in other sectors of the economy (Issac *et al.*, 1992, p. 191).

4. Chadha also points out a limitation of NSS data that it provides no straight clue to whether a particular source of employment is in rural, semi-urban or urban areas (Chadha, 1997, p. 186).

5. There appears to be considerable evidence that the increased government spending during 1976-90 was among the principal reasons why India could record rather impressive declines in poverty during this period (Sen, 1997, p. 105).

6. Mellor underlines that a stable and sustained growth of non-agriculture requires a broad-based agricultural development in which the gains of growth are equitably shared and also brings out the importance of macro policies including fiscal, monetary and commercial which are no doubt relevant for translating agricultural growth into higher rate of non-agricultural growth. He cites the case of Philippines in which an accelerated agricultural growth did not result in accelerated non-agricultural employment because of a pattern of urbanisation which is unfavourable (see Parthasarathy, 1997).

Visaria and Basant note that the distinction between rural and urban areas may limit the analytical framework of a study. A significant proportion of non-agricultural workers based in rural areas may actually be working in urban areas. They note that all researchers on these issues of urbanisation have reported a significant positive relationship between the rate of urbanisation and the proportion of non-agricultural workers in rural areas at the cross-sectional level. Evidently, the net impact of the aggregate relationship did not hold when the change in the share of non-agricultural employment in rural areas was related to the change in the level of urbanisation (Visaria and Basant, 1994, p. 29).

7. While early work on the subject invariably chose some measure of agricultural output *per capita*, some recent research uses agricultural output *per hectare* as the measure of agricultural performance. While this measure has the undoubted advantage it serves to obfuscate matters rather than to clarify them, especially because in actual fact yield increases have been associated with a sharp decline in the output elasticity of demand for labour (Sen, 1997, p. 79).

8. Bhalla notes: "Broadly speaking, of the three sectors of the rural economy in India, the tertiary sector has diversified the fastest, the secondary sector the second fastest, while the primary sector, taken as a whole, has scarcely diversified at all" (Bhalla, 1997, p. 149).

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