

GROWTH, COMPOSITION AND DETERMINANTS OF RURAL NON-FARM EMPLOYMENT IN ARUNACHAL PRADESH

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Rural non-farm employment (RNFE) has been gaining considerable importance in developing economies to overcome the problems of unemployment, underemployment, rural poverty and urban congestion. However, till date, no systematic study on the rural non-farm sector has been undertaken in India's North-Eastern region. The present paper is the result of a study undertaken by the author in the remote state of Arunachal Pradesh to fill this gap. The study reveals that, (a) there has been a continuous shift in rural economy of Arunachal Pradesh in favour of non-farm employment during the period 1971-1991, (b) in the RNFE category, transport, storage and communications, construction, non-household manufacturing and trade & commerce have become the dynamic sub-sectors of employment generation, (c) agricultural growth via consumption induced demand has played a significantly positive role in increasing the magnitude of RNFE in the State. The study underscores the importance of policy initiatives towards the modernisation of agriculture and the development of transport and communication for the full realisation of the potential of employment generation in this sector.

I. INTRODUCTION

For a considerable period of time, the commonly held perception with regard to rural non-farm sector (RNFS) was that it would wither away as the process of development consolidates. However, the existence and growth of this sector in most of the developing countries has belied this perception. On the other hand, in these economies, the agricultural and the modern formal sector (located in urban areas) are not in a position to absorb the growing labour force due to rising capital intensity. With the falling elasticity of employment with respect to agricultural output and the existence of high levels of disguised unemployment and underemployment in agriculture in rural areas, rural non-farm sector can be an outlet for absorbing large number of unemployed persons, thus providing a viable solution to the problem of rural unemployment and underemployment, rural poverty and urban congestion. Besides, the importance of rural non-farm employment (RNFE) is also explained in terms of its contribution to the job of modernising and servicing agriculture and meeting the non-food needs of the rural inhabitants (World Bank, 1978).

During the past few decades a number of studies have been undertaken, at macro levels, to quantify the magnitude, derive the trend, explain the determinants and to judge the efficacy of rural non-farm employment in meeting the expectations of the planners. Studies by World Bank (1978), Lanjouw and Lanjouw (1995), Vaidyanathan (1986), Papola (1992), Kundu (1991), Shukla (1992), Bhalla (1993), Chadha (1993), Unni (1991), Visaria and Basant

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(1994), Visaria (1995), Samal (1997), Parthasarathy, et al. (1998) have made considerable contribution in these areas. All these studies relate to various parts of the world, to the country as a whole and to various regions of the country except the North-East. Within the North-East, in the hilly and interior state of Arunachal Pradesh, not a single study has been undertaken with regard to any aspect of RNFE till date. This infant State over the past three decades has witnessed high decadal population growth (more than 35 per cent during the last three decades) and also large-scale developmental activities which are mostly state-sponsored. The agricultural sector is being modernised and the cultivable land-man ratio is worsening as reflected in the declining trend in the average size of land holding.¹ All these developments have brought in obvious changes in the pattern and composition of its workforce which have serious implications for the policy makers of the State.

It is in this perspective that the present paper makes a modest attempt to study at the macro level the nature, extent and determinants of RNFE in Arunachal Pradesh. The study is based on decennial Census data and covers the period 1971-91. Census data, in spite of their limitations, have been used, since other sources of data are either not available at all or are not available at disaggregated levels.

Trends in the relative shares and the annual growth rate² of farm and non-farm employment in Arunachal Pradesh during the period 1971-91 are given in Table 1.

Table 1
Rural Farm and Non-Farm Employment in Arunachal Pradesh

	Percentage share			Growth rate		
	1971	1981	1991	1971-81	1981-91	1971-91
Rural farm employment (RFE)	82.91	77.61	73.93	0.67	1.21	0.92
Rural non-farm employment (RNFE)	17.09	22.39	26.07	4.07	3.26	3.67

Source: *Census of India—Arunachal Pradesh*, (Various Issues).

The Table clearly shows that in the State, the share of (RNFE) has continuously increased and that of (RFE) has continuously decreased. The rate of increase has been higher than the annual growth rate of rural population.³

II. COMPOSITION AND DETERMINANTS OF RNFE IN ARUNACHAL PRADESH

The percentage shares of rural employment in non-household manufacturing, construction, trade and commerce, and transport, storage and communications sectors have witnessed increasing trends during the period 1971-91 (Table 2). On the other hand, the 'household manufacturing' and 'other services' sectors have experienced a decline in their relative shares during this period. In terms of annual growth rate, the transport, storage and communications component in the RNFE has experienced the highest growth rate (32.63 per cent). The 'construction' group has undergone the highest increase (more than 19 percentage points). On the whole, the transport, storage and communications, construction, non-household manufacturing and trade and commerce sectors have become dynamic sectors of employment generation in the rural areas during the period 1971-91. Another pertinent observation is that the 'other services' sector accounted for the highest percentage share among all the constituents of RNFE at both points of time, i.e. 1971 and 1991, but its relative share over the period, 1971-91, has declined by 37.41 percentage points.

Table 2
Composition of RNFE in Arunachal Pradesh: 1971-91

Industry category	Percentage share of RNFE		Annual growth 1971-91
	1971	1991	
Mining and quarrying	0.01	0.77	28.06
Manufacturing (a+b)	1.65	8.97	12.81
(a) Household mfg.	1.53	0.63	(-).048
(b) Non-household mfg.	0.12	8.29	28.17
Construction	0.48	19.79	24.90
Trade and commerce	1.93	8.87	11.87
Transport, storage and communications	0.02	3.10	32.63
Other services	95.91	58.50	1.14
RNFE as a whole	100.00	100.00	3.67

Source: Census of India—Arunachal Pradesh, (Various Issues).

1. Determinants of RNFE

The literature on determinants of RNFE finds agricultural growth, urbanisation, literacy, rural poverty and unemployment, infrastructural development and equity in the distribution of rural assets the major determinants. In this section, we have made a cross-sectional analysis to identify the factors that have bearing on the level of RNFE in Arunachal Pradesh. This has been undertaken with reference to two periods of time, viz., 1991 & 1981. The task has been difficult because proper data with respect to many of the influencing variables are not available for the State. In view of this limitation, we have analysed the effects of (i)

Table 3
District-wise Select Economic Indicators and Determinants of RNFE in Arunachal Pradesh, 1991

District	Main cereal crop yield per hect. Kg. (1991-92) X_1	Food crops yield per hect. Kg. (1991-92) X_2	% Urban population 1991 X_3	% Literacy rate 1991 X_4	Road length per 100 sq. km (1992) X_5	Number of bank branches (1992) X_6	% Share of RNFE to total rural main employment (1991) X_7
West Kameng	1213	1580	10.02	46.31	14	7	45.55
Tawang	1742	1706	0.00	29.78	43	3	40.70
East Kameng,	1296	1330	0.00	26.20	19	2	20.85
Lower Subansiri	901	896	25.50	41.57	13	16	20.16
Upper Subansiri	1245	1134	0.00	38.31	10	3	30.70
East Siang	1180	1277	13.23	44.30	22	12	23.28
West Siang	1134	1467	14.72	45.64	10	8	24.07
Lohit	1320	1506	21.19	49.21	12	4	31.59
D. Valley	1165	1207	16.20	46.88	5	2	33.59
Tirap	1114	1160	8.30	32.06	50	4	19.80
Changlang	1363	1459	0.00	43.19	20	4	24.77

Sources : (i) Census of India, 1991; (ii) Statistical Abstract of Arunachal Pradesh, 1994; (iii) Arunachal Agriculture in Brief (Series-3), 1994.

main cereal crop yield per hectares (X_1), (ii) food crop yield per hectares (X_2), (iii) urbanisation percentage (X_3), (iv) literacy percentage (X_4), (v) road length per 100 sq. km. (X_5), and (vi) number of bank branches (X_6) on RNFE for the year 1991. Variables (i) and (ii) have been included to show the effects of agricultural growth on RNFE; variables (iii) and (iv) to study the effects of urbanisation and literacy levels on RNFE and variables (v) and (vi) have been incorporated to see if infrastructure development has any role to play on the size of RNFE. For the year, 1981, we have analysed the effects of (i) main cereal crop yield per hectare (X_1), (ii) urbanisation percentage (X_2), (iii) literacy percentage (X_3) on the size of RNFE (X_4). Since data for food crops yield per hectare road length per 100 sq.km. and number of bank branches are not available, they could not be included in this correlation matrix. Tables 3 and 4 show the cross-sectional data for 1991 and 1981, respectively.

Table 4

District-wise Select Economic Indicators and Determinants of RNFE in Arunachal Pradesh, 1981

District	Main cereal crop yield per hect. (kg.) (1981-82)	% Urban population 1981	Literacy rate (1981)	% Share of RNFE to total rural main employment
	X_1	X_2	X_3	X_4
West Kameng	941	6.10	24.30	49.59
Tawang	1282	0.00	14.62	9.28
East Kameng	1098	12.53	7.73	17.51
Lower Subansiri	984	0.00	19.52	16.19
Upper Subansiri	1436	12.97	12.90	15.95
East Siang	1090	10.89	26.04	17.28
West Siang	1019	8.98	22.50	13.28
Lohit	1202	0.00	28.26	32.85
D. Valley	993	0.00	26.28	39.47
Tirap	987	0.00	19.33	18.58
Changlang	982	0.00	29.96	25.74

Sources: (i) Census of India, 1981; (ii) Arunachal Agriculture in Brief (Series-3), 1994.

Correlation coefficient matrices of these cross-sectional district level data for 1991 and 1981, respectively, have been constructed and are given in Tables 5 and 6 below.

Table 5

Correlation Coefficient Matrix of Percentage Shares of RNFE and Other Variables, 1991

	X_1	X_2	X_3	X_4	X_5	X_6	X_7
X_1	1	—	-	-	-	-	-
X_2	0.779*	1	-	-	-	-	-
X_3	-0.641	-0.366	1	-	-	-	-
X_4	-0.368	0.026	0.636*	1	-	-	-
X_5	0.396	0.181	-0.387	-0.655	1	-	-
X_6	-0.599	-0.422	0.630*	0.328	-0.162	1	-
X_7	0.525	0.630*	-0.147	0.216	-0.086	-0.311	1

*Significant at 5% level.

Table 6
Correlation Coefficient Matrix of Percentage Shares of RNFE and Other Variables, 1981

	X_1	X_2	X_3	X_4
X_1	1	-	-	-
X_2	-0.242	1	-	-
X_3	-0.469	0.371	1	-
X_4	-0.417	-0.039	0.533	1

The correlation matrix-1991 (Table 5) shows a positive correlation between percentage share of RNFE in rural main employment (X_7) and food crops yield per hectare (X_2), which is significant also. On the other hand, the coefficient of correlation between percentage share of RNFE in rural main employment (X_7) and main cereal crop yield per hectare (X_1) is though positive, yet it is not found to be significant at 5 per cent level. Broadly, however, this implies that agricultural growth has played a positive role in increasing the relative share of RNFE in Arunachal Pradesh. The coefficient of correlation between percentage share of RNFE and urbanisation is found to be negative and statistically not significant. The coefficient of correlation between percentage share of RNFE and literacy level is positive but not statistically significant. Further, both the infrastructure variables, i.e. road length per 100 sq. km. and number of bank branches have a negative coefficient of correlation with percentage share of RNFE and both the coefficients are not statistically significant. Thus, urbanisation, literacy and infrastructural development have little to do with the level of RNFE in 1991.

On the other hand, from the correlation matrix-1981 (Table 6), it is seen that the percentage share of RNFE in rural main employment (X_4) is positively correlated with literacy rate, and negatively correlated with main cereal crop yield per hectare (X_1) and percentage of urban population (X_2). None of these coefficients of correlation are found to be statistically significant.

III. AGRICULTURAL GROWTH AND RNFE

The results of correlation analysis for 1981 and 1991 show that agricultural growth is the significant variable affecting the level of RNFE in 1991, but not in 1981. This may be due to the fact that in the seventies and early eighties agricultural produce in Arunachal Pradesh was primarily for self consumption and not for being marketed. It is only in the mid eighties that the State initiated some steps towards a modernisation of agricultural sector, which resulted in high growth of and diversification in agricultural produce and a change in people's perception of agriculture from need-based to a market based one. This positive significant relationship between agricultural growth and RNFE in 1991 can theoretically be attributed to the production and consumption linkages that agricultural growth might have created. However, in the context of Arunachal Pradesh, the production linkage is found to be weak except for some degree of forward production linkage in terms of generation of employment in processing industries. The main reason why agricultural growth has promoted RNFE has been a rise in the incomes of the producers resulting in higher demand for non-agricultural goods and services and consequently increased employment in the non-farm sectors in rural areas. Since, there is enough scope for increasing farm production especially

horticultural production in the State, in the coming days, the forward production linkage along with an increased consumption induced demand, are going to assume great importance. This may result in high degree of positive correlation between agricultural development and level of RNFE in future.

Degree of urbanisation and the level of RNFE are negatively correlated both in 1981 and 1991. This may be because of the operation of urban pull factors in both the years. As transport and communication facilities between the urban centres and the surrounding villages have not improved much, the worker cannot stay in the rural areas and commute to the work place in the urban centres.

IV. CONCLUSION

In the rural economy of Arunachal Pradesh, there has been a continuous sectoral shift in favour of non-farm employment during the period 1971 to 1991. Among the various constituents of RNFE, transport, storage and communications, construction, non-household manufacturing and trade and commerce have become the dynamic sectors of employment generation. Agricultural growth, urbanisation, education, infrastructural development and distress diversification have been accepted as the well known determinants of the level of RNFE. Our analysis in the context of Arunachal Pradesh reveals that except for agricultural growth in 1991, the other variables i.e. urbanisation and literacy, have not been found to have any determining effect on the level of RNFE in both the years—1981 and 1991. Agricultural growth has promoted RNFE mainly via consumption induced demand. Of course we have not tested for the variables of distress diversification. But, considering that the unemployment rate in Arunachal Pradesh is one of the lowest⁴ in the country, this variable is unlikely to have any determining effect on the level of RNFE. Finally, we feel that the increase in the percentage share of RNFE has a lot to do with exogenous factors such as the effect of State policy on (a) the various sub-sectors of the rural non-farm sectors directly and (b) on administration and social sector indirectly. We have not been able to capture this in our analysis here because of obvious limitations.

Arunachal's economy is an infant one. There is a considerable scope for increasing the share of RNFE in the State by means of increasing farm production and farm productivity. Measures towards the diversification, modernisation and commercialisation of agriculture have, however, not been undertaken on a large scale in the State. Irrigation holds the key to these initiatives. As per the Agriculture Census (1990-91), only 10.47 per cent of the total operated area was under irrigation. In the coming years, emphasis should be given on providing increasing irrigation facilities in the State so that the consequent increase in forward production linkage and consumption induced demand enhances the share of RNFE.

Finally, urbanisation in Arunachal Pradesh has not been matched with adequate infrastructural development, especially in terms of transport and communication facilities. As a result, the rural people can neither commute for employment in non-farm enterprises in the towns nor can they start high value non-farm enterprises in the rural areas. Thus, the need of the hour is to improve the transport and communication facilities between the urban centres and the adjacent villages so that urbanisation has a positive impact on the level of RNFE in future.

Notes

1. Average size of land holding has declined from 6.19 hectares in 1970-71 to 4.27 in 1980-81 and to 3.62 hectares in 1990-91. See *Arunachal Agriculture in Brief*, Series-3, Govt. of Arunachal Pradesh, 1994.
2. Annual Growth rate has been calculated by applying the formula $r = (p_1/p_2)^{1/m} - 1$
3. Average annual growth rate of rural population in Arunachal has been calculated to be 2.61 per cent.
4. As on 31.3.94, the total number of job seekers enrolled in live register of employment exchanges in the State was 2871. This figure may not represent the correct unemployment situation, but gives an idea of it.

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