
RURAL INDUSTRIAL EMPLOYMENT IN ARUNACHAL PRADESH

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In developing economies, for a long time, modern formal manufacturing sector and the ever expanding public sector were considered to be bastions of employment creation. However, of late, with the rising capital intensity in the former and initiation of structural adjustment programmes to downsize employment in the latter; these economies are not in a position to absorb the growing labour force. Elasticity of employment with respect to output has been diminishing in a number of sectors in these economies. This falling elasticity of employment in the formal sector as well as in agriculture, makes Rural Non-Farm sector to be seen as a viable sector for solutions of the problem of rural unemployment and rural poverty. Rural Non-Farm Sector has a number of components. Rural Manufacturing or Industrial Employment (here after referred as RIE), is an important component of it. A large number of studies in Indian context have been undertaken on various aspects of Rural Non-Farm Employment (RNFE). Most of the studies were, either macro level ones or based on other regions of the country. Even the micro studies don't take into consideration the case of a hilly tribal state like Arunachal Pradesh. This author had undertaken a study of various aspects of RNFE in the state of Arunachal Pradesh in 1997 which also prominently included the sectoral composition of RNFE. The present paper is based upon this study. All data incorporated in this paper are from the various census reports of Government of India.

Table 1 : Composition of RNFE in India and Arunachal Pradesh, 1971-91

| Industry category | Percentage share in RNFE | | | | Annual Growth rate(1971-91) | |
|---------------------------------------|--------------------------|--------|-------------------|--------|-----------------------------|-------------------|
| | India | | Arunachal Pradesh | | India | Arunachal Pradesh |
| | 1971 | 1991 | 1971 | 1991 | | |
| Mining & Quarrying | 2.67 | 2.64 | 0.01 | 0.77 | 2.77 | 28.06 |
| Manufacturing(a+b) | 36.26 | 43.29 | 1.65 | 8.97 | 2.24 | 12.81 |
| Household mfg | 21.16 | 20.20 | 1.53 | 0.68 | 0.05 | (-)-0.48 |
| Non-household mfg | 15.11 | 20.04 | 0.12 | 8.29 | 4.30 | 28.17 |
| Construction | 4.88 | 5.88 | 0.48 | 19.79 | 3.80 | 24.90 |
| Trade & Commerce | 16.10 | 18.51 | 1.93 | 8.87 | 3.56 | 11.87 |
| Transport, storage and communications | 5.38 | 6.97 | 0.02 | 3.10 | 4.18 | 32.63 |
| Other services | 34.69 | 33.78 | 95.91 | 58.50 | 2.71 | 1.14 |
| Total | 100.00 | 100.00 | 100.00 | 100.00 | 2.84 | 3.67 |

Source: Author's calculation based on various census reports.

Rural Industrial Employment and RNFE

Trends in the composition of Rural Non-Farm Employment (RNFE) and the share of Rural Industrial Employment (RIE) in the context of A.P. and India are given in Table 1.

From Table 1, it is evident that at the national level in both points of time i.e. 1971 and 1991, manufacturing or industrial sector employment formed the highest share among all the sectors of RNFE, whereas at Arunachal level, it was the other services sector employment which formed the highest share in RNFE. In 1971, rural industrial (mfg) employment in Arunachal formed only 1.65 of total RNFE and here the household mfg. sector employment formed 1.53 percent and non-household manufacturing sector employment only 0.12 percent. The implication is that in 1971, rural industrial employment was negligible in total employment and whatever little employment rural industries provided, most of it was in the household industries segment. In 1991, i.e. 20 years latter, rural industrial employment in A.P has increased to 8.97 percent of the RNFE, suggesting creation of more jobs is in the rural industrial sector. But when one looks into the composition of the rural industrial sector employment in 1991, the non household sector provided almost all the jobs, making the household sector virtually a non-entity (only 0.68 percent of RNFE). In terms of growth rate over this period 1971-91, rural household industrial employment in fact has experienced a negative growth rate of 0.48 percent. This has happened mostly because the rural household industries could not withstand the competition from the modern formal industrial sector and change in the tastes and preferences of rural consumers due to integration of the region with the national market network.

Comparing the national figure with that of Arunachal from growth rate angle, it is seen that over this period i.e. 1971-91, at the all India level, it is the non-household industrial employment in RNFE which has experienced the highest growth rate followed by employment in transport, storage and communications sector; whereas at the state level, it is employment in transport, storage and communications sector which has experienced the highest rate (32.63%) followed by employment in the non-household industry group (28.17%). However, one thing is very clear, i.e., in terms of rural industrial employment, Arunachal lags much behind the national figure, the latter being 5 times more of the former. This clearly suggests that rural Industrialisation is still in its infancy in Arunachal Pradesh.

Determinants of Rural Industrial Employment

Since RIE is a constituent of RNFE, it is assumed here that the variables/factors that determine the level of RNFE do also determine the level of RIE. Generally, agricultural growth, urbanisation, literacy percentage, infrastructural development, rural poverty, rural unemployment and public policy have been the most talked of factors determining the magnitude of RIE in an economy. However, the job of an analysis involving these variables in the context of Arunachal Pradesh has been a difficult one in the sense that proper data with regard to many such influencing variables are not available in the state. Given this limitation, an attempt is made here to study the effects of a handful of variables/factors on the level of RIE through a multiple correlation model. These variables are, (i) fruit crop yield per hectare (X_1), (ii) food crops yield per hectare (X_2), (iii) urban population percentage in 1991 (X_3), (iv) Literacy percentage in 1991 (X_4), (v) Road length per 100 sq km (X_5), (vi) number of bank branches (X_6). Variables (i) and (ii) have been incorporated to know the effects of agricultural growth on RIE. Variables (iii) and (iv) are self explanatory and have been included to ascertain the effects of urbanisation and literary growth on RIE. Variables (v) and (vi) are infrastructural variables and have been included in the model to know if infrastructure development has anything to do with growth of RIE. A multiple correlation analysis has been undertaken to find out the nature of such relationships and their significance. The data used are cross sectional ones and pertain to 11 districts in existence in 1991. Year 1991 has been chosen as this is the latest census year for which data are available at present. The cross sectional data of probable determinants of RIE in Arunachal Pradesh have been given in Table 2.

From the correlation matrix, it is evident that RIE is positively correlated with fruits yield per hectare, food crops yield per hectare, urbanisation and literacy percentages. This positive correlation is the highest with literacy percentage. However, none of these positive correlation is statistically significant. Hence, we can not with certainty attribute this little growth in RIE to any of these given variables. Further, the correlation of RIE is negative with both the infrastructural variables. The implication from this is that, (i) banks have played little role in promoting rural industrialisation in A.P., (ii) much of the rural industrial activity is area/village specific with very less in the form of interregional trade. Finally, although the positive relationships of RIE with literacy and fruit yield are not statistically significant, yet it can be inferred that,

Table 2 : Select Economic Indicators and Determinants of RIE in various Districts of Arunachal Pradesh

| District | Fruit yield per ha (1991-92) kg | Food crops yield per ha (1991-92) kg | Urban population (%) in 1991 | Literacy rate (%) 1991 | Road length per 100 km ² | Number of Bank branches (1992) | % share of RIE to total rural main employment (1991) |
|-----------------|--|---|------------------------------------|------------------------------|--|---|--|
| | X_1 | X_2 | X_3 | X_4 | X_5 | X_6 | X_7 |
| West Kameng | 1590 | 1586 | 10.02 | 46.31 | 14 | 7 | 2.68 |
| Tawang | 2410 | 1706 | 0.00 | 29.78 | 43 | 3 | 0.77 |
| East Kameng | 1800 | 1330 | 0.00 | 26.20 | 19 | 2 | 0.64 |
| Lower Subansiri | 830 | 896 | 25.50 | 41.57 | 13 | 16 | 0.86 |
| Upper subansiri | 800 | 1134 | 0.00 | 38.31 | 10 | 3 | 0.86 |
| East Siang | 2350 | 1277 | 13.23 | 44.30 | 22 | 12 | 1.2 |
| West Siang | 3520 | 1467 | 14.72 | 45.64 | 10 | 8 | 1.31 |
| Lohit | 4890 | 1506 | 21.19 | 49.21 | 12 | 4 | 3.95 |
| D. Valley | 1920 | 1207 | 16.20 | 46.88 | 5 | 2 | 4.67 |
| Tirap | 1680 | 1160 | 8.30 | 32.06 | 50 | 4 | 3.79 |
| Changlang | 2000 | 1459 | 0.00 | 43.19 | 20 | 4 | 4.39 |

Source : (1) Census of India reports for 1991 (11) Statistical Abstract of A.P. 1992 (iii) Arunachal Agriculture in Brief(Series-3), 1994.
The resultant coefficient matrix of these cross-sectional data is given in table.3

in days to come, education and agricultural growth (horticulture included) may hold keys to further expansion of rural industrial base and rural industrial employment in Arunachal Pradesh. My earlier analysis which explains agricultural growth as a statistically significant determinant of rural non farm employment in AP, further strengthens this inference. At this juncture, whatever growth in RIE has happened might have happened because of some other exogenous factors such as Government's policy towards industrialization and rural industrialization, which have not been accounted for in this model.

Table 3 : Correlation Coefficient Matrix of Percentage Shares of RIE and Other Variables

| | X ₁ | X ₂ | X ₃ | X ₄ | X ₅ | X ₆ | X ₇ |
|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| X ₁ | 1 | - | - | - | - | - | - |
| X ₂ | 0.669 | 1 | - | - | - | - | - |
| X ₃ | 0.297 | -0.366 | 1 | - | - | - | - |
| X ₄ | 0.380 | 0.026 | 0.636 | 1 | - | - | - |
| X ₅ | -0.087 | 0.181 | -0.387 | -0.664' | 1 | - | - |
| X ₆ | -0.167 | -0.421 | 0.629 | 0.327 | -0.162 | 1 | - |
| X ₇ | 0.267 | 0.096 | 0.171 | 0.456 | -0.033 | -0.368 | 1 |

Significant at 6% level.

Conclusion and Limitations

Arunachal is an industrially backward state. The volume of rural industrial employment as a percentage of total rural main employment was negligible in 1971. However, its rural economy has experienced a continuous sectoral shift in favour of Non-Farm Employment during the period 1971-1991. Although, 'other services sector' still constitutes the sector having the highest percentage of rural non-farm employment in 1991; the share of rural industrial sector employment has experienced a modest increase. Much of this increase has happened in the non-household industrial sector. The household industrial sector employment has rather experienced a negative growth over this period of 1971-81. This trend needs to be arrested. The modest increase in the share of RIE during 1971-91 can not be very definitely attributed to any given factor, as shown in our correlation model. However, given the nature of positive

correlation, we can, of course, with caution assume that, spread of education and agricultural (including horticulture) growth have played some role in enhancing the share of RIE in Rural Non-Farm Employment. They need to be consolidated in coming years. Secondly rural industrial investment and marketing network need to be improved. Finally, it is felt that, state policy on industrialisation in general and rural industrialisation in particular matters a lot here. In our present analysis we have not been able to capture this because of data constraints. This certainly remains a limitation of our analysis. In addition to all these, the sociological factor is also an important factor influencing industrialisation in any given society and more so in the rural segment of it. In this model, it has not been possible to capture its effect on rural industrialisation and RIE in Arunachal Pradesh because of obvious complexities involved. This is another limitation of our analysis.