



ICSSR NERC

# **Structural Change and Strategy of Development**

## **RESOURCE-INDUSTRY LINKAGES IN NORTH EAST INDIA**

**GURUDAS DAS**

**Structural Change**  
*and*  
**Strategy of Development**  
Resource-Industry Linkages in North-East India



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## Introduction

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Neither structural change in the economies of developing countries strictly follow Clarkian framework, developed in the 1940s, nor do they meticulously follow Kuznets transformation, conceived during the 1960s and 70s. It appears that there is no single stylized path towards economic development. There are instances where countries are striving towards development without Kuznets transformation in relation to their sectoral performances. Of course, there is no dearth of instances as well where economic development has been the outcome of sectoral transformation along Kuznets line. In fact, Kuznets' observations are based on the development experiences of the developed countries. However, the opening up of the national economies and their ever increasing interdependence have created a condition in the global economy where sectors across the national boundaries may get interlinked and a country may experience economic development without showing structural change of Kuznets variety. There is no denying the fact that economic development accompanies structural change, but the fact is that this change may or may not conform to the Kuznets transformation.

One may view economic development both in short term as well as in long term perspectives. Conformity between economic development and change in the structure of an economy may not be realizable, although desirable, in the short term. But it is desirable in the long term as the question of sustainability is involved. After all, the resiliency of an economic structure depends largely on the inter-sectoral linkages. As the different sectors of an economy draw upon each other in a variety of ways, the stronger the inter-sectoral linkages the higher is the resiliency of the structure and vice versa. Thus, Kuznets transformation may be regarded as an indicator of resilient long term development of an economy.

It is in this context that the authours in this volume have looked into the sectoral performances of the economies of the states of north east India and the changes in sectoral share of labour force in them. Although similar studies are available at country level, this volume attempts to fill the gap at the regional/local level. The need for such a venture has been felt for long as the economic policy making in these states has been suffering from lack of systematic analysis of structural transformation in them and the implications of this change for policy interventions. Apart from structural change, the contributors have

also looked into the resource base and its linkage with the industrial structure in the states of north east India. These exercises enable us to locate the strengths and weaknesses in each of the economies and find out alternative options for policy formulation for promoting development in them.

It has been observed that the share of primary sector in Net State Domestic Product (NSDP) is on the decline in all the states of north east India. But the decline in the corresponding share of labour force engaged in this sector lags far behind. This allows one to infer about the overcrowding and consequent declining labour productivity in agriculture and increasing pauperization of the rural life. This brings into the fore the urgency of expanding non-farm sector in all the states in the region.

Within a three tier sectoral classification, Kuznets transformation talks about increasing shift of income and labour from primary to secondary and then to tertiary sector. It has been, however, observed that the secondary sector in these states either remained stagnant or has experienced deceleration over time in terms of both income generation and employment of labour. A further segregation of the secondary sector show that much of the income generated in this sector is coming from construction activities rather than manufacturing. In fact, the contribution of the manufacturing activities to the share of secondary sector is on decline in majority of the states in the north east. This is, no doubt, a major cause for concern as far as the long term resiliency of these economies are concerned. This has led to the weak resource-industry linkages in all the states.

However, the rise in the share of the tertiary sector in NSDP has compensated the fall in the share of primary sector. In all the states, the contribution of the tertiary sector to NSDP is increasing over time. It has been observed that within the tertiary sector, public administration is contributing the most. Thus, it is the government expenditure that generates income in this sector. This is another major cause for concern. This leads one to conjecture that market forces are not strong enough to mobilize local resources and generate income in these economies.

Thus, unlike Kuznets transformation, there has been a distinct movement of these economies from primary to tertiary sector bypassing the secondary sector. The weak linkage between the primary and secondary sectors has made the transition of the former from tradition to modernity difficult. Moreover, the poor growth of the secondary sector has weakened the base of the tertiary sector. The grafted growth of the tertiary sector not only suffers from lack of self-sustenance but also breeds socio-political tensions as the labour force trained in it could hardly be absorbed in non-agricultural sector.

Contributions in this volume may be categorized into two types. There is a set of state-specific studies which have looked into these issues in depth at the state level. P.K. Kuri has covered Arunachal Pradesh. He has observed that the poor growth of the secondary sector in Arunachal Pradesh may be due to the very low plan allocation for this sector. His analysis of structural change in Arunachal economy and distribution of plan allocation make a *prima facie* case in favour of this hypothesis which may be taken up further for rigorous exposition. Besides bringing this hypothesis into fore, he also analysed the causes of poor industrial growth in the state. M.A. Salam, in his supplementary observation, also has argued to establish strong intersectoral linkages for promoting industrial development in Arunachal Pradesh. While covering Assam, Kishor Singh Rajput

has observed that structural change in the economy of Assam has bypassed the secondary sector. This has crippled the economy of the state, which is showing the signs of deceleration for last five decades. Archana Sharma, in her supplementary observation, has noted the weak resource-industry linkages in Assam. Amar Yumnam has looked into the economy of Manipur. He has observed that the structural change that Manipur is being experiencing is absolutely different from the Kuznets transformation. He has pointed out that the increase in the share of the secondary sector in NSDP in Manipur is not because of the growth of manufacturing activities *per se* rather due to the better coverage of the unorganized activities which were not covered earlier. Rajesh Dutta has dealt with the economy of Meghalaya. His analysis shows that the structural transformation has bypassed the secondary sector and the resource-industry linkage is very weak in Meghalaya. Nirankar Srivastav has also observed very little change in the structure of the secondary sector in Meghalaya. Santanu Ray has made similar observation in relation to the economy of Mizoram. He has pointed out that construction activities contribute far more to the share of secondary sector than manufacturing activities. Gorky Chakraborty, in his supplementary, has pointed out the importance of people's participation while considering the options for strengthening resource-industry linkages in Mizoram. B. K. Jamir has studied the economy of Nagaland. She has also pointed out that contribution of construction activities to secondary sector is much higher than manufacturing. E. Bijoykumar Singh has commented on the need to study structural change in terms of more disaggregated sub-sectors. Anil Bhuimali and Kanak Kanti Bagchi have studied the economy of Sikkim and come out with similar observations. The Sikkimese economy also exhibits a movement from primary to tertiary activities. Manufacturing is almost non-existent. K. S. Chakraborty has looked into the economy of Tripura. Tripura is also experiencing a movement from primary to tertiary activities. The resource-industry linkages remain very weak in the economy of Tripura.

Another set of contribution focus on the region as a whole. These contributions have looked into the issues from a broader perspective. Utpal Kumar De has noted that although the percentage contribution of the primary sector across the states of the region is on decline, it still plays the predominant role in generating income and employment for the people. B. Mishra has studied the impact of public expenditure across the different sectors of the economies of Meghalaya and Nagaland. The hypothesis forwarded by P.K. Kuri and B.K. Jamir has been testified in Mishra's contribution. He observed that public expenditure is done more on social services compared to economic services. This has resulted in the disproportionate growth of the service sector in both Meghalaya and Nagaland. B.S. Butola has viewed the problems of development of the region from "other" perspective. He has made a critique of the "traditional" way of looking at the problems through resource-industry linkages. Instead, he forwarded a view to look into these problems through "culture-society-economy-environment interlinkages". Rabindra N. Bhattacharya has identified a number of problem areas relating to the long term development of the region. He has observed that given the socio-political uncertainty, the firms extracting the renewable as well as non-renewable resources in the region will unlikely to take into account the future expectations (opportunity cost) into its cost calculation and hence likely to overuse these resources. This may lead to catastrophic



consequences for the economies of the region in the long run. He has observed further that the take-off into higher growth rates and sustainable economic development will be directly related to the ability of these economies to manage their natural resources efficiently and sustainably over the medium to long term. At the end, I have tried to touch upon the political economy of underdevelopment and some policy options for promoting development in the region.

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I am thankful to C.J. Thomas, Director, ICSSR-NERC, who has taken all the trouble to organize the studies that made up the volume, and yet given me the opportunity and pleasure of editing it.

Shillong  
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# 1

## **Changing Economic Structure and the Prospects of Resource Based Industrialization in Arunachal Pradesh**

*—Pravat Kumar Kuri*

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### **INTRODUCTION**

Structural transformation is inevitable in the process of economic development. It is, in fact, an inseparable concomitant of economic development/industrialization (Kuznet, 1966). Colin Clark is said to be the first thinker to theorise the structural change that takes place in a tri-sectoral economy. He identifies a negative association between per capita income and the share of the primary sector in labour force, and a positive association between per capita income and the share of the secondary and tertiary sectors in labour force (Clark, 1940). In the economy of Arunachal Pradesh structural transformation is a recent phenomenon. At the time of Independence, this state lagged far behind the other parts of the country in terms of development indices. The economy of the State was a mono-economy characterized by traditional slash-and-burn method of agriculture and few small and cottage industries (Roy, 1995). Modern sectors, both tertiary and secondary where production is organized at the non-household level did not emerge then. After independence, the Government followed Nehru-Elwin Policy of isolation, the policy which encouraged the autonomous development of tribal population (Elwin, 1959). However, this policy witnessed a serious set back during the Chinese aggression in 1962 and was replaced by an active policy which aimed at removing the economic disparities between Arunachal Pradesh and other parts of the country. Heavy investments were made to develop the infrastructure - road, communications and other facilities - and administration was decentralized by locating different offices inside the State. Since independence the development of this state has been rapid and the socio-economic disparities between it and other parts of the country reduced significantly (Roy and Kuri, 2001). The literacy rate, which was negligible at the time of independence, increased to 54.74 per cent in 2001, a rate that is comparable to other parts of the country. Economic development along

with government-sponsored urbanization has brought about significant changes in the structure of the economy.

### **TRENDS IN NET STATE DOMESTIC PRODUCT**

Net State Domestic Product (NSDP), which is considered to be the most important single indicator of the overall performance of the economy, multiplied nearly 7.5 times in Arunachal Pradesh from Rs.13140 lakhs in 1970-71 to Rs. 98025 lakhs in 1999-2000 with an average annual exponential growth rate of 7.55 per cent at 1993-94 prices. The decadal decomposition of growth rate reveals that the state experienced the highest

**Table 1 : Annual Exponential Growth Rates of NSDP and Per Capita NSDP in Arunachal Pradesh during 1970-71 and 1999-2000 (at 1970-71 base prices)**

	1970-71 to 1999-2000	1970-71 to 1979-1980	1980-81 to 1989-1990	1990-91 to 1999-2000
NSDP	7.55 (51.19)	7.07 (9.66)	7.81 (27.20)	4.88 (7.21)
Population	2.87 (132.86)	3.04 (73.43)	3.21 (50.01)	2.49 (260.87)
Per Capita NSDP	4.68 (33.21)	4.02 (5.33)	4.70 (15.17)	2.39 (3.53)

Note: Figures in the parentheses are the 't' values

Source: Linking Series Estimates of SDP of Arunachal Pradesh: 1970-71 to 1999-2000, Directorate of Economics and Statistics, Government of Arunachal Pradesh, Itanagar.

rate of growth in 90's during which NSDP grew at the rate of 7.81 percent per annum. Compared to 90's, the last decade of the 20th Century witnessed a 40 per cent fall in the annual exponential growth rate of NSDP. The growth rate was observed to be 4.88 per cent per annum during 1999-2000.

Per capita income is commonly used as an index of the standard of living of the population of a country/state. The rate of growth of per capita income, by definition, is the rate of income (GNP/NSDP) and the rate of growth of population. In Arunachal Pradesh, the rate of growth of population is high, in fact, much higher than the national average. During thirty years period from 1970-71 to 1999-2000, the population of Arunachal Pradesh grew at the exponential rate of 2.87 per cent per annum. The decadal segregation reveals that in the 80's annual exponential growth rate of population was 3.04 per cent, which further increased to 3.21 per cent in the 90's. On the other hand the last decade of the twentieth century witnessed a relatively smaller rate of growth of population (2.39 per cent annum). However, this rate is still much higher than the national average of 1.93 per cent per annum. Therefore a larger proportion of income growth is absorbed by a significantly higher rate of growth of population in Arunachal Pradesh. In effect, in spite of a relatively higher rate of growth of income, the per capita income of the state grew rather modestly. During the thirty years period since 1970-71, the per capita income grew at the rate of 4.68 per cent per annum. The trend growth rate of per capita NSDP was observed to be 3.04 per cent, 3.21 per cent and 2.49 per cent during 80's, 90's and the last decade of the 20th century respectively. The State experienced a significant deceleration in both the NSDP and per capita rates of growth in the recently concluded decade. The performance of Arunachal economy also slowed down in relation to the National economy. To substantiate this point an attempt has been made to compare the per capita NSDP of

Arunachal Pradesh vis-à-vis the national average. For this purpose the per capita NSDP of Arunachal Pradesh as percentage of the per capita National income (at 1993-94 prices) has been regressed on time. The result for different time periods is shown in table-2 below.

During 1970-71 to 1999-2000, the per capita income of Arunachal Pradesh vis-à-vis the national average increased at

**Table-2 : Trends of per-capita NSDP of Arunachal Pradesh relative to National Average during 1970-71 to 1999-2000 and decadal sub-periods at 1993-94 prices**

1970-1971 to 1999-2000	1970-71 to 1979-1980	1980-81 to 1989-1990	1990-91 to 1999-2000
$Y=56.08+1.70t$	$Y = 52.71 + 1.91t$	$Y = 75.89+1.53t$	$Y=108.21-1.52t$
$\bar{Y}=82.46$	$\bar{Y} = 63.20$	$\bar{Y} = 84.3$	$\bar{Y} = 99.88$
$R^2=0.08$	$R^2 = 0.74$	$R^2 = 0.66$	$R^2 = 0.29$
$N = 30$	$N = 10$	$N = 10$	$N = 10$

Note: (i) Y=Per Capita NSDP of Arunachal Pradesh as percentage of per capita national income at 1993-94 prices. (ii) t = time period (iii) N= number of observations (iv)  $\bar{Y}$  = mean per capita income

Source: (i) Linking series Estimates of SDP of Arunachal Pradesh: 1970-71 to 1999-2000, Directorate of Economics and Statistics, Government of Arunachal Pradesh Itanagar. (ii) Economic Survey, 2001 - 2002, Government of India.

the rate of 1.70 per cent per annum. The average relative position of per capita income during the period stood at 82.46 per cent of the national average. In the 80's the relative per capita income of Arunachal Pradesh grew at the rate of 1.91 per cent per annum, which declined to 1.53 per cent in 90's. However, the decade, 1990-91 to 1999-2000, experienced a reverse situation during which the per capita NSDP of Arunachal Pradesh declined while at the same time there was an increase in national average. As a result regression co-efficient took the negative sign (-1.52). Therefore, it can be asserted that in the growth performance of per capita income, Arunachal Pradesh slipped down the national average in the last decade of the twentieth century. In terms of relative per capita income (see Appendix table-I), Arunachal occupied 20th position in 1980-81 among all the states and Union Territories of the Country in 1980-81 and 4th among the States of North East India (next to Tripura, Nagaland and Meghalaya). Her position improved to be 12th in 1990-91 among the States and Union territories and second among the States of North East India, only next to Nagaland. She maintained her ranking unchanged in 1997-98 among the states of North East India but dropped to 15th position among all the States and Union territories of the country.

### SECTORAL GROWTH IN NSDP

To have a deeper insight into the growth of NSDP, the analysis has been further carried out at more disaggregated level, that is, for different sub-sectors of the economy and the result is presented in table- 3 below.

Among the different sub-sectors of the primary sector, fishery showed the fastest growth rate (20.60 per cent) during 1970-71 to 1999-2000, followed by mining and quarrying (17.60 per cent), agriculture (6.80 per cent) and forestry and logging (3.33 per cent). It is to be noted that the high growth rates of fishing and mining and quarrying were simply due to their low base values. The highest decadal growth rates in all the sub-sectors of the

primary sector were observed in 90's. However, growth rates in all the sectors slowed down sharply in the last decade. In fact, mining, forestry and logging experienced a negative growth rates during the period. The negative growth rate of the forestry and logging is the outcome of the Supreme Court ban imposed on December 12, 1996 putting restrictions on non-forest activities in the forest of the country.

**Table-3 : Annual exponential Growth rates of NSDP under different sectors and sub-sectors during 1970-71 to 1999-2000 and decadal sub-periods in Arunachal Pradesh(base price: 1970-71)**

NSDP under Sectors/sub-sectors	1970-71 to 1999-2000	1970-71 to 1979-1980	1980-81 to 1989-1990	1990-91 to 1999-2000
Primary	6.18 (24.37)	4.61 (8.28)	8.34 (11.19)	1.33 (1.19)
Secondary	8.01 (24.26)	8.03 (3.89)	6.71 (6.03)	6.21 (3.47)
Tertiary	9.52 (44.63)	11.40 (7.19)	7.64 (19.89)	8.14 (11.59)
Agriculture	6.80 (29.72)	6.40 (11.38)	8.85 (15.02)	2.19 (2.69)
Forestry & logging	3.33 (5.28)	3.20 (0.32)	4.67 (1.67)	-4.58 (-1.06)
Fishery	20.60 (28.13)	14.30 (6.75)	32.80 (10.78)	10.40 (13.61)
Mining	17.60 (8.57)	14.30 (1.99)	36.40 (3.02)	-0.63 -0.17)
Manufacture	13.10 (11.61)	14.20 (16.44)	15.00 (3.66)	-4.18 (-1.96)
Construction	7.32 (18.75)	7.70 (3.45)	6.04 (4.42)	5.12 (2.26)
Banking	17.90 (15.88)	28.70 (6.77)	18.60 (8.37)	8.70 (4.78)
Communication	4.83 (5.30)	10.10 (7.66)	-1.82 (-0.58)	12.90 (4.26)
Trade	2.53 (7.12)	10.50 (8.06)	2.77 (6.45)	-0.50 (-0.37)
Estate	6.68 (3.98)	-3.59 (-6.95)	10.30 (1.34)	-11.20 (-4.72)
Administration	-0.48 (-1.11)	3.75 (3.08)	-4.56 (-2.68)	5.97 (3.87)
Other services	10.60 (23.76)	9.57 (2.91)	8.58 (7.28)	6.82 (3.56)

**Note:** Figures in the parentheses are the 't' values

**Source:** Linking series Estimates of SDP of Arunachal Pradesh: 1970-71 to 1999-2000, Directorate of Economics and Statistics, Government of Arunachal Pradesh Itanagar.

Among the different sub-sectors of the secondary sector, the registered and un-registered manufacturing sector showed the highest growth rate of 13.10 per cent per annum, followed by construction (7.32 per cent). However, in spite of government's earnest efforts to extend a number of facilities to the intending industries and entrepreneurs, the manufacturing sector failed to maintain a positive rate of growth in the last decade of the 20th century.

In tertiary sector, banking service registered the highest growth rate of 17.90 per cent per annum during 1970-71 to 1999-2000 followed by other services (10.60 per cent) and communication (4.83 per cent). The trend growth rates improved significantly in the 80's in all the sub-sectors but slowed down in the 90's. In fact, during the 90's communication sector experienced a negative trend rate of growth.

## CHANGING STRUCTURE OF THE ECONOMY

The analysis of the sectoral composition of NSDP over time gives an idea of the relative position of different sectors of the economy along with its changing structure. The standard tri-sectoral classification of the economy is adopted to identify the relative importance of

**Table-4 : Sectoral Contribution of NSDP and Main Workforce Participation in Arunachal Pradesh : 1970-71,1980-81, 1990-91 and 1999-2000(Base price-1993-94)**

Year	NSDP (in Rs. Lakh)	Per capita NSDP (in Rs.)	NSDP (in lakh) from							No. of Main Workers in						
			Primary Sector	4	Primary Sector	5	Secondary Sector	6	Tertiary Sector	7	Primary Sector	8	Tertiary Sector	9	Total Workforce	10
1970-71	13140	2808	7778	2672	2690	216823	1196	51523	269542	(59.19)	(20.34)	(20.47)	(80.44)	(0.44)	(19.12)	(100)
1980-81	24889	4001	11767	5528	7594	23595	27960	49525	313436	(47.28)	(22.21)	(30.51)	(75.28)	(8.92)	(15.80)	(100)
1990-91	58876	6902	27192	12695	18989	263666	33859	93451	390976	(46.19)	(21.56)	(32.25)	(67.44)	(8.66)	(23.90)	(100)
1999- 2000(Q)	98025	9170	34586	21446	41993	-	-	-	-	(35.28)	(21.88)	(42.84)	-	-	-	-

Source: (i) Linking series Estimates of SDP of Arunachal Pradesh: 1970-71 to 1999-2000, Directorate of Economics and Statistics, Government of Arunachal Pradesh Itanagar.

(ii) Figures in the parentheses are the percentage of total NSDP/Workforce

(iii) Census of India, 1971, 1981 and 1991



different sectors in NSDP of Arunachal Pradesh during 1970-71 to 1999-2000. Let us first confine our analysis to the discrete level i.e. on four different points of time during the reference period as indicated in column 1 of table 4.

A close reading of table-4 reveals some important facts about the sectoral aspects of the structure of the economy of Arunachal Pradesh. A horizontal reading of column 4,5 and 6 for all the four points of time shows that the share of the primary sector in State's total NSDP has been declined continuously since 1970-71. In 1970-71, the primary sector claims 59.19 per cent of the NSDP; the secondary sector 20.34 per cent while the tertiary sector contributes 20.47 per cent. In the same year, primary sector's share of main workforce exceeds 80 per cent, which is more than four times the share of workers in the tertiary sector. In 1970-71, the secondary sector accounts only 0.44 per cent of the total workforce of the economy. That is to say, in 1970-71, the economic structure of the State is dominated by the primary sector. Like 1970-71, in 1980-81 and 1990-91 also the primary sector dominates the economic structure of the state. However, there is a gradual decline in the importance of the primary sector and a compensatory rise in the importance of secondary and tertiary sectors both in terms of the sectoral contribution to NSDP and total workforce. In 1990-91, the primary sector dominates the economic structure of the state by claiming 46.19 per cent of the NSDP and 67.44 per cent of the workforce. The situation changes in 1999-2000. The tertiary sector dominates the economic structure by claiming 42.84 per cent of the NSDP. However, the primary sector continues to occupy the dominant position in terms of workers absorption ratio. So far as the non-primary sectors are concerned, in all the four points of time, the tertiary sector has higher NSDP and workforce compared to the secondary sector.

Therefore, the data in table-4 help us to identify the relationships between the level of economic development, as measured by per capita income (column 3), and the sectoral composition of income and workforce. Along with the increase in per capita income, there is a clear shift away from the primary sector to the non-primary sectors. The shift is more pronounced in the case of NSDP than in the case of workforce. The change in the share of different sectors in NSDP and in workforce participation is better explained in table-5.

It is evident from table 5 that the positive changes in the per capita NSDP (column-8) are accompanied by negative changes in the share of the primary sector (column-2) and positive changes in the share of the secondary sector (column-3; except in 1980-81 to 1990-91) and tertiary sectors (column-4) at different points of time. The percentage change in the share of workforce in the primary sector has been declined consistently over the period (column 5) along with matching increase in the secondary and tertiary sectors (column 6&7). It is interesting to note that the percentage change in the share of NSDP or workforce of all the sectors together is, in fact, a *zero-sum-game*. The sum of the changes of any two sectors is having equal magnitude but opposite signs when compared to the third sector (columns 2-4 and columns 5-7). This signifies that one sector expands at the cost of others and there is a clear indication that structural change in the economy of Arunachal Pradesh has led to a significant decline in the contribution of the primary sector to NSDP and /or workforce participation and a matching increase in the contribution of secondary and tertiary sectors. However, the change in the tertiary sector has been lopsided. Tertiary sector has been expanded at much faster rate than the secondary sector.

**Table-5 : Changes in the Economic Structure of Arunachal Pradesh**

1	% Change in the share in NSDP of the			% Change in the share in the Workforce of the			8
	2	3	4	5	6	7	
Period	Primary sector	Secondary sector	Tertiary sector	Primary sector	Secondary sector	Tertiary sector	% Change in per capita NSDP
1970-71 to 1980-81	-11.91	1.87	10.04	-5.16	8.48	-3.32	+42.49
1980-81 to 1990-91	-1.09	-0.65	1.74	-7.84	-0.26	8.10	+72.51
1990-91 to 1999-2000	-10.91	0.32	10.59	-	-	-	+32.86
1970-71 to 1990-91	-13.00	1.22	11.78	-13.00	8.22	4.78	+145.80
1970-71 to 1999-2000	-23.91	1.54	22.37	-	-	-	+226.57

Source: (i) Linking series Estimates of SDP of Arunachal Pradesh:1970-71 to 1999-2000, Directorate of Economics and Statistics, Government of Arunachal Pradesh Itanagar.

(ii) Census of India, 1971, 1981 and 1991

The existence of fluctuations over time implies that we cannot generalize about underlying trends on the basis of comparisons between selected end points. No doubt, our estimates for these selected years confirm the direction of change between these particular end points and accord well within the predictions of development theory. However, there is a danger of using such comparisons for any assessment of the underlying trends. This can only be done on the basis of time series as a whole. Accordingly, a linear time trend is fitted to the extent of share of each sector and sub-sectors in NSDP. For the sake of comparison, the same exercise is done for the national economy with reference to GNP. The resulting estimates are reported in table-6.

There is clear evidence of a significant negative time trend in the share of primary sector both at state level and the national level during 1970-71 to 1999-2000. Arunachal Pradesh experienced the decline of her primary sector at the rate of 0.66 percentage points<sup>1</sup> per annum compared to 0.67 percentage points decline experienced by the country (the results of the linear time trend of the sub-sectors of the economy are given in appendix table-II). The decline in the contribution of primary sector to NSDP has been compensated by the combined rise in the contribution of secondary and tertiary sectors both at the state and national economy, however, at varied rates. In Arunachal Pradesh, the contribution of secondary sector increased at the insignificant rate of 0.09 percentage points<sup>2</sup> while the tertiary sector rose at the significant rate of 0.56 percentage points per annum<sup>3</sup>. The tertiary sector replenished around 86 percent of the fall of the primary sector, remaining 14 per cent by the secondary sector. In the national economy, tertiary sector replenished around 72 percent of the fall of the primary sector, remaining 28 per cent by the secondary sector. Thus the tertiary sector of the economy of Arunachal Pradesh made its headway at a faster rate than that of the national economy. The secondary sector is the weak sector of the economy. Decade-wise analysis reveals that there is uniform pattern of structural transformation in the national economy: the contribution of the primary sector has been declined over the last three decades while there is an increase in the contribution of secondary and tertiary sectors. In contrast to national economy there are decadal fluctuations in the pattern of structural transformation in Arunachal Pradesh. However, one point is common in both the national economy and the economy of Arunachal Pradesh that over the years the structural change has brought about a slow and steady shift away from the primary sector towards secondary and tertiary sectors and the tertiary sector has gradually been appearing as the dominant sector of the economy.

To sum up, the primary sector is found to be the most dominant sector in the economy of Arunachal Pradesh both in terms of its share in the NSDP and workforce. The structural change in Arunachal Pradesh shows a slow and steady shift away from the primary sector towards the secondary and tertiary sectors. However, what is unusual in the structural change of Arunachal Pradesh is that the service sector expanded at the expense of the secondary sector<sup>4</sup>. In recent years, tertiary sector is found to emerge as the dominant sector of the economy lagging much behind the secondary sector.

### **NEED FOR SECTORAL RE-ADJUSTMENT IN THE STATE PLAN**

The formal planning process in Arunachal Pradesh started since the fourth five year plan with a meagre allocation of only Rs. 17.99 crores for the entire State. The plan allocation increased steadily over the successive five year plans: 63.30 crores in the fifth plan, 212 crores in the sixth plan, and 400 crores in the seventh plan. In the draft tenth

**Table-6: Structural transformation in Arunachal Pradesh vis-a-vis India: Linear time trend- 1970-71 to 1999-2000 and decadal sub-periods (1993-94 prices)**

Year	Arunachal Pradesh			India		
	Primary sector	Secondary sector	Tertiary sector	Primary sector	Secondary sector	Tertiary sector
1970-71 to 1999-2000	P=60.23-0.66t =50.04 R <sup>2</sup> =0.70	S=19.40+0.09t =20.85 R <sup>2</sup> =0.09	T=20.37+0.56t T=29.12 R <sup>2</sup> =0.75	P=48.71-0.67t =38.40 R <sup>2</sup> =0.97	S=19.81+0.19t =22.67 R <sup>2</sup> =0.91	T=31.49+0.48t =38.93 R <sup>2</sup> =0.96
1970-71 to 1979-1980	P=63.10-1.29t =55.98 R <sup>2</sup> =0.50	S=19.14+0.24t =20.46 R <sup>2</sup> =0.07	T=17.76+1.06t =23.57 R <sup>2</sup> =0.71	P=48.33-0.66t =44.72 R <sup>2</sup> =0.76	S=19.58+0.23t =20.87 R <sup>2</sup> =0.64	T=32.09+0.42t =34.41 R <sup>2</sup> =0.73
1980-81 to 1989-1990	P=49.09+0.33t =50.91 R <sup>2</sup> =0.14	S=21.26-0.28t =19.74 R <sup>2</sup> =0.15	T=29.65-0.06t =29.35 R <sup>2</sup> =0.03	P=43.20-0.80t =38.81 R <sup>2</sup> =0.91	S=21.18+0.26t =22.61 R <sup>2</sup> =0.92	T=35.63+0.54t =38.58 R <sup>2</sup> =0.86
1990-91 to 1999-2000	P=51.38-1.49t =43.22 R <sup>2</sup> =0.76	S=20.76+0.29t =22.35 R <sup>2</sup> =0.54	T=27.86+1.20t =34.44 R <sup>2</sup> =0.54	P=36.29-0.84t =31.66 R <sup>2</sup> =0.95	S=23.96+0.10t =24.53 R <sup>2</sup> =0.22	T=39.75+0.74t =43.81 R <sup>2</sup> =0.93

**Note:** P stands for primary production as percentage of NSDP(GDP) of AP(INDIA) is the mean percentage rate

S stands for secondary production as percentage of NSDP(GDP) of AP(INDIA)

is the mean percentage rate

T stands for tertiary production as percentage of NSDP(GDP) of AP(INDIA)

is the mean percentage rate

R<sup>2</sup> is the correlation of determination

Source: (i) Linking series Estimates of SDP of Arunachal Pradesh: 1970-71 to 1999-2000, Directorate of Economics and Statistics, Government of Arunachal Pradesh Itanagar.

(ii) Economic Survey, 2001-2002, Government of India.

five year plan the proposed allocation for Arunachal Pradesh has been fixed Rs. 4627 crores over Rs. 3569.89 crores in the Ninth plan and Rs. 1155 crores in the Eighth plan. Throughout the planning process three sectors namely Transport & Communication, Service and Agriculture & Allied sector have received priority status in Arunachal Pradesh. In the fourth five year plan transport and communication got the highest priority. It was followed by agricultural & allied services and the social & community services. Industry and minerals received a meagre sum of only Rs. 0.99 crores of the total outlay. Over the fifth, sixth, and seventh five year plan periods some old sectors have been divided into smaller sub-sectors to provide special attention to some of these sub-sectors. However, the predominance of transport, services, and agriculture in receiving high allocations has remained more or less intact. Sectoral allocation of Plan outlay since sixth five year plan is given in table 7.

Since the eighth five year plan the Government of Arunachal Pradesh has been following a uniform pattern of sectoral priorities. In the eighth five year plan, service sector got the highest priority having received 32.05 per cent of the plan outlay. It was followed by the transport and communication sector which received 29.78 per cent, and agricultural & allied services including rural development, special area program, irrigation and flood control, forestry and wild life got 22.89 per cent. Industry and minerals received only 2.12 per cent of the plan outlay. This pattern again followed in the ninth and draft tenth plans. In the ninth five year plan social and community services has received the highest allocation being 38.58 per cent of the proposed total outlay. The second position has gone to the transport and communication sector with an allocation of 26.04 per cent. The combined allocations of agriculture and allied sector including rural development and irrigation and flood control amount to 21.00 per cent of the total plan outlay. In recent years specifically seventh plan onwards energy sector has been receiving much attention in terms of plan allocation. In the ninth five year plan the allocation to energy sector was 13.09 per cent of the proposed outlay.

The trends of the plan allocation to industries and minerals show that Arunachal Pradesh has never considered industrialization to be the priority area in any of the previous plan periods. It is interesting to note that plan allocation in Arunachal Pradesh to industry and minerals has never crossed even five per cent of the total plan outlay. The relative share of industry has either remained constant or declined over the successive plan periods. In the ninth plan proposed allocation was only 1.29 per cent of the total outlay.

The allocation towards service sector is very high in Arunachal Pradesh. This sector is being received on an average more than one third of the total plan outlay since the eighth five year plan. In the absence of rudimentary government services in the remote areas of the state, higher allocation to the service sector seems to be appropriate. Moreover, ever since the introduction of planning in Arunachal Pradesh, the main focus has been attached to the construction activities and building up of infrastructure. Given the accidented topography of the state, this priority to the development of infrastructure again seems to be quite relevant. It is to be noted in this context that higher capital formation in these sectors have been made at the cost of other developmental activities. With the meager allocation to industry and mineral sector one cannot expect any worthwhile industrialization in the State. There should be a balance between agriculture, industry, trade and service sector for bringing about all round economic development in the State.

**Table-7: Sectoral Plan Outlay in Arunachal Pradesh (Rs. in crores) since sixth five year plan**

Plan Period	Agriculture & Allied	Industry & Minerals	Transport & communication	Energy	Services	Total
Sixth (1980-85)	78.52 (37.04)	10.26 (4.84)	56.10 (26.46)	-	67.12 (31.66)	212.00 (100)
Seventh (1985-90)	118.05 (29.51)	9.50 (2.38)	127.15 (31.79)	36.90 (9.22)	108.40 (27.10)	400.00 (100)
Eighth (1992-97)	264.38 (22.89)	24.49 (2.12)	343.93 (29.78)	151.96 (13.16)	370.24 (32.05)	1155.00 (100)
Ninth (1997-02)	749.69 (21.00)	46.10 (1.29)	929.51 (26.04)	467.13 (13.09)	1377.46 (38.58)	3569.89 (100)
DraftTenth (2002-07)	1100.79 (23.79)	82.57 (1.79)	1161.56 (25.10)	595.38 (12.87)	1686.70 (36.45)	4627.00 (100)

Notes:(i)Agriculture and allied sector includes agriculture, rural development, special area program, irrigation and flood control, forestry and wild life. The service sector includes general economic services, social service, education, general services and science, technology and environment. (ii) Figures in the parentheses are the percentage of total

Source: Directorate of Planning and Development, Government of Arunachal Pradesh, Itanagar.

## NATURAL RESOURCES IN ARUNACHAL PRADESH

In any judicious and rational planning resource survey is of fundamental importance. Natural resources exist in the environment as stock from which economic activity draws flows of inputs. Optimal utilization of natural resources is the pre-condition for sustained economic development of any region or country. The existence of vast resource base creates conditions for comparative cost advantage in economic activities. Arunachal Pradesh has a wide and varied natural resource. Since the days of NEFA administration attempts have been made to identify the resource base of this region. National council of applied economic Research (NCAER) in its techno-economic report (1967) identified forests and hydropower as two important resources in the region that have tremendous potential for development. However, the survey team felt that the region is not well endowed with mineral resources that can be effectively utilized for any worthwhile industrialization programme in the region (Datta, 1991). The exploitation of natural resources involves enormous initial investment. The cost of exploitation becomes exceptionally high if we include social and environmental cost associated with it. No cost benefit analysis has yet been undertaken in this state to estimate the available resources in value terms. Under the circumstances, we like to have a glance on the physical features of some of the important resources in Arunachal Pradesh

### LAND

Arunachal Pradesh is basically a hilly State, only a very small proportion of its geographical area is plain. Exactly 3.35 thousand hectares, which constitutes around 4 per cent of the total geographical area, is plain. Out of total geographical area of about 84 thousand square kilometers, 70 per cent constitutes broad and narrow valleys, 10 per cent foot hills and flat areas and remaining 20 per cent constitutes snow clad peak area. The area of agricultural operation confined to only 4.18 per cent of the total geographical area (Govt. of Arunachal Pradesh, 2000). The reported area for land utilization was 54950 sq. km in 1995-96, which constituted around 66 per cent of the total geographical area. Out of which 94 per cent was under forest cover and only 3.37 per cent was under net sown area (Basic Statistics, NER 2000, p.32). However, the percentage of net sown area to total operational area tended to show a rising trend. In 1970-71, 23.56 per cent of the total operated area was under net-sown area that increased to 28.29 per cent in 1976-77, 35.19 per cent in 1980-81, 43.37 per cent in 1985-86 and further to 47.33 per cent in 1990-91. This was made possible mainly through the reclamation of culturable wasteland. Over the years, a substantial proportion of culturable wasteland was brought under cultivation. The culturable wasteland, which was 30.41 per cent in 1970-71 declined to only 9.43 per cent in 1990-91 (Basic Statistics NER, 2000).

Two types of agriculture are prevalent in Arunachal Pradesh: shifting cultivation or slash-and-burn method of cultivation which is locally known as jhumming; and the permanent cultivation. Because of the high environmental costs associated with shifting cultivation, efforts have been made by the government to wean away the farmers from shifting cultivation to permanent cultivation. Due to sustained efforts made in this direction, the net sown area under permanent cultivation has steadily increased in the State. In 1970-71, 75.69 per cent of the net sown area was under jhumming remaining 24.31 percent was under permanent cultivation. However, the situation changed significantly in 1990-

91 during which around 56 per cent of the net sown area was under permanent cultivation and the remaining 44 per cent was under jhumming.

Per-capita availability of land resource is an important policy variable. In Arunachal Pradesh, because of the smaller size of population the per capita availability of land is high and above the national average. In 1970-71, the per capita availability of usable land in Arunachal Pradesh was 0.93 hectares. It declined continuously in all subsequent Agricultural censuses and reached to 0.31 hectares in 1990-91. The land-man ratio of Arunachal Pradesh is still much higher than the all India average of 0.23 hectares. In fact, Arunachal Pradesh occupied 4th position in northeast India in terms of per capita availability of land next to Mizoram, Meghalaya, and Nagaland (Bhattacharya, 2000). However, compared to its total geographical area, per capita availability of agricultural land in Arunachal Pradesh is low because of its hilly terrain and a vast area of land is under forest cover. With limited agricultural land and rising population, operational holding in the state has tended to show a declining trend.

**Table-8 : Per-capita availability of Agricultural Land in Arunachal Pradesh ( in hectares)**

Year	Available land for use ('000')	Population ('000')	Land per-capita
1970-71	433	468	0.93
1976-77	326	566	0.58
1980-81	246	632	0.39
1985-86	267	727	0.37
1990-91	263	865	0.31.

**Note:** Total land available for use has been estimated by adding net sown area, current fallow, fallow other than current fallow and culturable wasteland.

**Source:** *Agricultural 1990-91*, Extracted from table 2-13.3 P.4, Agricultural Census Division, Department of Agricultural, Arunachal Pradesh

In 1970-71, the average size of operational holding in Arunachal Pradesh was 6.19 hectares, it declined continuously in all the successive Agricultural Censuses and reached to 3.71 hectares in 1990-91. Moreover, during the 20 years period from 1970-71 to 1990-91, there was significant fragmentation in agricultural landholdings.

The number of small and marginal holdings (area less than 2 hectares), which was 19.63 per cent of total agricultural land holdings in 1970-71, increased to 36.25 per cent in 1990-91. The small size of holding is economically unviable. It acts as a hindrance to agricultural mechanization and so incapable to generate agricultural surplus.

## FOREST

Arunachal Pradesh is rich in forest resources. The state covers only 0.11 per cent of the population while its geographical area constitutes 2.5 per cent of total area of the country. As high as 61.55 per cent of the total geographical area of the state is under forest cover as against 22.8 per cent for the country as a whole. Total forest cover of the state is 51540 sq. km, which is largest among the states of North East India and second highest among the states of India only next to Madhya Pradesh (Forest Statisticse, (2000-2001).



According to legal status, there are seven fold classification of forests in Arunachal Pradesh. The estimate of the latest forest statistics is shown in table-9 below.

**Table-9 : Legal forest Status in Arunachal Pradesh-2000-2001**

Sl. No.	Legal Classification	Area (sq.km.)	% of recorded forest	% of geographical area
1	Reserved forest	9722.69	18.86	11.61
2	Protected forest	694.30	1.35	0.82
3	Anchal Reserve forest	329.38	0.64	0.39
4	Village forest	300.24	0.58	0.36
5	National Parks	2468.24	4.79	2.94
6	Wild life sanctuary	7059.75	13.70	8.43
7	Unclassified State forest	30965.39	60.08	36.90
Total		51540.00	100	61.55

**Source:** Forest Statistics, 2000-2001, Department of Environment and Forest, Itanagar Arunachal Pradesh.

For the scientific management and sustainable use of forest produce, around 19 per cent of the forest cover of the State has been brought under the category of reserve forests. The unclassified state forest constitutes the highest 60.08 per cent of the total forest area of the State. Only 0.64 per cent of the forest cover is under Anchal Reserve forest. National Park and Wildlife Sanctuary together constitutes 18.49 per cent of the total forest cover of the State.

As per the satellite imaginary data, the forest cover of the State is much higher than what has been reported in the forest statistics. One such estimate conducted by FSI, Dehradun. As per the assessment in 1999, the total forest area of the State is 68,847 sq.km, which constitutes 82.21 per cent of the total geographical area. Out of total forest area, 83.89 per cent accounts for dense forests while the remaining 16.11 per cent under open forests. By occupying 10.80 per cent of the total forest cover, Arunachal Pradesh ranked second among the States of India next to Madhya Pradesh, which covered 20.71 per cent of total forest area of the country.

The per capita availability of forest area is significantly higher in Arunachal Pradesh compared to the national average of only 0.12 hectares. In Arunachal Pradesh the per capita availability of forest area is 6.31 hectares (Forest Statistics, 2000-2001). This high per capita availability of forest area is mainly due to the low population size in the State. With a geographical area of 83,743 sq.km, the density of population is only 13, which is lowest in the country (Census, 2001). It is interesting to note that under Inner Line Regulation Act 1873 which is still in operation in the state, no migrant people have any rights in the natural resources-land, forest etc. Therefore, an average autochthons of this state enjoys around 9.91 hectares of forest area<sup>5</sup>. This figure is one of the highest in the country.

Forest is an important source of revenue in the State. In 1992-93, the forest revenue contributed 66.34 per cent of the state revenue while the plan allocation to forestry sector was only 4.06 per cent. During 1992-93 to 1995-96, forest sector alone contributed on an average 60 per cent of the state revenue per annum. Thereafter there was a sudden decline

of forest revenue in 1997-98; from 60.81 per cent in 1996-97 to only 18.15 percent in 1997-98. This sudden decline is mainly due to the imposition of a ban on the extraction of forest and forest production by the Supreme Court in 1996. It is also evident from the table that in the recent years of along with the decline of forest revenue, the plan outlay of the forest sector tended to show a declining trend. This is really a cause for concern. This trend needs to be altered, and fund allocation in the forestry sector must be increased substantially so that more investment in forestry sector could be made to increase the productivity of forests.

**Table-10 : Forest Revenue and Plan Outlay in Arunachal Pradesh**

Year	Revenue (in lakh)	% of State Revenue	Forest Plan Outlay	% of State Plan
1990-1991	2157.95	NA	674.35	4.00
1991-1992	2594.48	NA	862.12	4.16
1992-1993	2847.79	66.34	956.00	4.06
1993-1994	3964.54	66.37	996.00	3.77
1994-1995	3488.77	49.96	1182.00	3.55
1995-1996	4904.39	72.18	1377.79	3.14
1996-1997	2523.60	60.81	1271.00	2.78
1997-1998	753.17	18.15	1471.00	2.86
1998-1999	1243.47	39.96	1071.00	2.31
1999-2000	1544.17	34.18	1572.00	3.12
2000-2001	1299.72	NA	1093.50	1.70

Source: Forest Statistics, 2000-2001, Department of Environment and Forest, Itanagar, Arunachal Pradesh

## HYDRO-ELECTRIC POWER

Arunachal Pradesh is considered to be the storehouse of huge hydroelectric power potential of the county. Almost all major rivers of the State are perennial and most of them provide ample scope of hydroelectric power. There are various estimates of hydroelectric power potential in Arunachal Pradesh. It is estimated that out of 84044 MW (at 60 per cent load factor) hydropower potential of the country, 26747 MW i.e. 32 per cent is available in Arunachal Pradesh (Draft tenth five year plan document, p.58). This figure is 30,000 M.W as per State Government's estimate (Economic Review, 1999) and 27000 M.W as per the estimates of Tata Consultancy Service (p.68). Arunachal Pradesh occupies top most position in the country in terms of hydroelectric potential (TCS-1997, P.3-2). The total hydropower potential available in the State is estimated to be one third of the entire hydro potential of the country. If a part of the available hydro-power potential is explored, the State will not only be self sufficient in fulfilling the power requirement of the state but at the same time it can take care of the power demand of the entire region. Thus, "the hydropower potential of the State offers not just local opportunities but a promise of national solution and wider regional prosperities through inter-country grid connection and exchange" ( Shukla Commission Report, 1997).

In spite of the immense potentiality of hydroelectric power, only a small part of it has been tapped so far. The low harness rate in the State is mainly due to three reasons: (i)

hydropower project is capital intensive in nature. Harnessing of hydel power potential requires a huge capital investment;(ii) steep hilly topography and inaccessible terrain act as deterrents to undertake any major hydel power plant in the state; (iii) Arunachal Pradesh falls under seismically high sensitive zone. The setting up of hydel projects requires construction of large dams. There is a possibility of considerable submerger and displacement associated with the establishment of hydroelectric power plant. It is estimated that at the beginning of the tenth plan the total power demand of the State will be of the order of 94 MW. As of now there are 43 small hydel projects with an aggregate installed capacity of 32.12 MW (the most important among them are Tago(4,500KW), Mai I & II (3,000KW), Dirang(2000KW), Dibang Vally (1350KW), Yabung(2000KW), Along(1200KW), Lohit(1000KW), Khonsa(1000KW)). Thus, shortfall at the beginning of Tenth Plan is around 62 MW. Currently this shortfall is partially met through diesel generation (9.68) and partly by importing power (about 22 MW) from Central sector generating projects located in other states of North East. Arunachal Pradesh is badly placed in terms of installed capacity and power generation. Tata Consultancy Services placed Arunachal Pradesh at 20th position among the states of India in terms of power-installed capacity. In 1999-2000, total installed capacity in hydel electric power was 30.57 MW.

**Table-11 : Source- wise Installed and Generated Capacity of Electricity in Arunachal Pradesh**

Year	Installed capacity (M.W)			Generated (M.U)		
	Total	Hydel	Diesel	Total	Hydel	Diesel
1993-94	39.35	23.55	15.80	60.10	48.35	11.75
1994-95	39.53	23.65	15.88	68.53	50.81	17.72
1995-96	48.88	23.83	25.05	66.67	49.77	16.90
1996-97	48.88	23.83	25.05	88.55	68.55	20.00
1997-98	53.88	23.83	30.05	89.29	69.25	20.04
1998-99	55.51	30.74	24.77	66.89	54.35	12.54
1999-2000	65.57	30.57	35.00	62.21	52.10	10.11
Total change (1993-94 to 1999-2000)	26.22	7.02	19.20	2.11	3.75	-1.64
Percentage change (1993-94 to 1999-2000)	66.63	29.81	120.52	3.51	7.76	-13.96

Source: *Statistical abstrat*, 2000, p. 55, Directorate of Economics and Statistics, Government of Arunachal Pradesh.

Out of total power installed capacity of 65.57 MW, diesel power accounts for 35.00 MW which is around 53 per cent of the total installed capacity in 1999-2000. The installed capacity of hydel power in the State has increased by 30 per cent during 1993-94 to 1999-2000. While the installed capacity of diesel power has increased significantly from 15.80 MW in 1993-94 to 35.00 MW in 1999-2000, the increase is about 121 per cent during the period. Further, table-11 indicates that the consumption of electricity has been increasing steadily in the State. Total power installed capacity and generating capacity has increased by 66.63 per cent and 3.51 per cent respectively during seven years period 1993-1994 to 1999-2000.

In recent years the state government has emphasized on the development of hydro-power sector, which has taken a firm footing by the setting up of National Hydro electric Power Corporation (NHPC), the North Eastern Electrical Power Corporation ( NEEPCO) and the Brahmaputra Board in the State . The Ranganadi project being built by NEEPCO and NHPC on the right bank of Dikrong river, which is on the verge of completion, is expected to be generated 405 MW of electricity. With the completion of this project Arunachal Pradesh will become a surplus state in generating hydel power. Moreover, the State has undertaken a number of new projects to harness its vast hydroelectric potential.

**Table-12 : Ongoing and New Hydel Projects in Arunachal Pradesh**

Projects	Capacity(MW)	Total Costs (in crores)
<b>Ongoing</b>		
Ranganadi Phase-I	405	920
<b>New</b>		
Kameng	600	1,785
New Subansiri	7,300	16,435
Noa Dihang (cascade)	20,000	31,215
Ranganadi, Phase-II	100	544
Dikron	100	298
Domwe	520	2200
Total	29,025	53,397

Source : Shukla Commission Report(1997). Extracted from annexure table-8, p.76A

With the persistent efforts of the State Government, the Central Government has approved the first feasibility report submitted by NHPC on Middle Siang(1000MW), Middle Subansiri(1600 MW), Upper Subansiri(2000 MW) and Lower subansiri(2000) hydro power projects. Construction of these projects will start during the Tenth Plan period and scheduled to be commissioned by the end of the Eleventh Plan. For construction of Ranganadi Hydro Electrical Project Phase II of 100 MW, a MoU was signed with the NEEPCO and the project would be commissioned during the Eleventh Plan period. Moreover, NEEPCO has been entrusted to undertake survey and investigation works on Kameng river, Tawang river and Pare river in Papumpare district. The Brahmaputra Board has also been entrusted to start survey and investigation works on Lohit, Noa dihang and Tirap river basins.

## MINERALS

Minerals occupy a position of strategic importance from the point of view of planning for economic development. The mineral resource deposits of the State have not yet been fully assessed. Preliminary survey and studies conducted by the Geological Survey of India and other various organizations like Oil India Limited; Mineral Exploration Corporation Limited etc. have indicated the occurrences of rich mineral resources in Arunachal Pradesh. But, till date this state is geologically least explored. For scientific exploration

and utilization of mineral wealth of the State, a Mineral Development and Trading Corporation (APDMTC) has been set up in the State in 1991. Moreover, for exploitation of mineral resources, the State Government has created a Department of Geology and Mining in the year 1995. There are large varieties of minerals that exist in the natural environment of Arunachal Pradesh. The total value of mineral production in Arunachal Pradesh was Rs. 11 crores in 1994-95 registered a decline of 30 per cent compared to Rs. 16 crores in the previous year. Petroleum (crude) accounted for 99 per cent of value of mineral production in Arunachal Pradesh in 1994-95. Coal, dolomite, limestone, graphite, marble, oil and natural gas, lead, zink and other minerals occur in the State. Important minerals, their reserves and locations are given in appendix table-III. Remote location of the mineral deposits and lack of infrastructures hamper the development of State's mineral sector. The harnessing of potential requires heavy capital investment. Many of the mineral reserves are under forest cover and commercial exploitation of these may affect the fragile economic system of the State adversely.

## HUMAN RESOURCES

Human resource generally means total quantitative and qualitative human aspects in a society. The term human resource development may be defined as a process of organizing and enhancing the physical, mental and emotional capabilities of individuals for productive works. An efficient and satisfied workforce is the main significant factor in organizational effectiveness and managerial excellence and so a deciding factor in economic development.

## POPULATION TREND

As per Census 2001, the total population of Arunachal Pradesh is 10.91 lakhs. The decadal growth rate of population has come down from 36.83 per cent in 1981-91 to 26.21 per cent in 1991-2001. Along with the growth rate of population, the percentage of tribal population has been declined steadily over the decades; it has declined from 88.67 per cent in 1961 to 63.66 per cent in 1991. Sex ratio, on the other hand, is an important aspect of population characteristics. It has an important bearing upon socio-economic status of people. There is a considerable improvement in sex ratio in the State in 2001 with 901 females per 1000 males as against 859 in 1991.

**Table-13 : Growth of Population, Density and Literacy Rate in Arunachal Pradesh: 1961-2001**

Year	Popu- lation (in Lakhs)	%of Tribal Popu- lation	Decadal growth rate (%)	Literacy			Sex (per sq. (per '000' male)	Density (per km.)
				Male	Female	Person ratio		
1961	3.37	88.67	-	12.24	1.42	7.23	894	04
1971	4.68	79.02	38.91	17.82	3.71	11.29	861	06
1981	6.32	69.82	35.15	28.94	11.32	20.79	862	08
1991	8.65	63.66	36.83	51.10	29.37	41.59	859	10
2001	10.91	NA*	26.21	64.07	44.24	54.74	901	13

Note: \*figure for 2001 is not yet available.

Source: Census of India, 1961,1971,1981,1991and provisional population total of 2001 Census.

## **LITERACY RATE AND EDUCATION**

Education is an important component of human resource. It is considered as a kind of capital i.e. a stock, embodied in human beings that will yield the future income stream. It is, in fact, a sound investment in man. The modern education is a post independence phenomenon in Arunachal Pradesh. At the time of independence formal education was almost unknown to the indigenous people of the State. There were only two primary schools in the entire state prior to 1947 and the literacy rate was almost negligible. However, with the successive plan efforts, Government made significant progress in the spread of education in Arunachal Pradesh. Educational institutions, mainly schools, were established, funded and nurtured by the Government. In effect, educational institutions grew at a very fast rate in the State. There are as many as 1849 educational institutes including one University and a Technical Institute in the State as on 31.03.2000 (Govt. of Arunachal Pradesh, 2000). During the last forty years, the literacy rate of the State has increased more than 7.5 times from 7.23 per cent in 1961 to 54.74 percent in 2001. There is no doubt that the State has achieved tremendous success in education sector. Still, the literacy rate in Arunachal Pradesh is much below the all India average of 65.38 per cent. One of the reasons for low level of literacy in the state is the high dropout rate at the primary level. To combat this problem government has undertaken a number of incentive schemes like free supply of textbooks, school uniforms, providing hostel facilities etc. Government's efforts have led to a gradual decline of dropout rate in the state. The primary dropout rate in the State that was as high as 66.14 per cent in 1984-85 has declined to 49.50 per cent in 1998-99.

## **TECHNICAL SKILLS**

In Arunachal Pradesh institutional facilities for technical education is very poor. North Eastern Regional Institute for Science and Technology (NERIST) established in 1986 is the only major institute in the State for imparting training in technical education. Apart from NERIST there are only a few Institutes in the State e.g. the Rural Industrial Development Centre at Dirang in West Kameng, Industrial Training Institutes (ITI) at Roing and Taborijo for imparting training in technical education. Trades like draughtmanship, TV/radio repairing, secretarial practices, blacksmithy, tinsmithy, automobile servicing, welding etc. are being taught in these institutes. There are no institutes in the State to study the technical disciplines like medicine, veterinary, pisciculture, etc. Since 1991 to 1999, 2798 students have been sent to other States to study various technical disciplines like Medicine (363), Agriculture (232), Veterinary (117), Horticulture (4), Engineering (2050, both for degree and diploma), Pisciculture (7) and Handloom technology and Sericulture (25)(Government of Arunachal Pradesh, 1999).

## **TRADITIONAL SKILLS**

Most of the tribes in the State have expertise in the manufacture of various handloom and handicrafts items. The major items for traditional handicrafts are- (i) Weaving, (ii) Cane and bamboo works (iii) Pottery, (iv) Black smithy, (v) Metal and ivory works and (vi) Wood carving and carpentry etc. (Das, 1995). These traditional skills of the indigenous people are considered to be an important aspect of human resources of the State.

## **INDUSTRIAL STRUCTURE IN ARUNACHAL PRADESH**

Arunachal Pradesh is one of the industrially backward States in India. The State has a very unique industrial structure; it has no heavy industry and no large industrial structure. Since Independence, industrial activities in the state are mainly concentrated to the small scale village and cottage industries. In the whole State there are only 18 medium scale industries, out of them, 13 are located in three districts namely Lohit, Changland and Tirap. Almost all the medium scale industries are forest resource based e.g. saw mills, veneer mills, plywood industry etc. In the industrial structure of cottage and small scale units, crafts and sericulture constitute main activities of trades. The people of Arunachal Pradesh have a tradition of artistic craftsmanship in a variety of crafts such as weaving, painting, smithy work, basket making, woodcarving etc. Handloom is a household occupation throughout the State. The major handloom products are carpet, galley, jacket, shawl, galuk, wall hanging, cane hat etc. There are 4694 registered village and small scale industrial units in the State, out of them, only 1764 units are operative (Government of Arunachal Pradesh, 2000).

The existing industries in Arunachal Pradesh can broadly be classified into eight categories: (i) weaving and textile, (ii) wood & wood products (iii) trade (iv) services (v) Printing (vi) engineering (vii) agro-based & (viii) mineral based industries (TCS, 1997). Weaving and textile include weaving centers, knitting centers and small garment making centers, these centers fulfill the local demand for weaving & textile. The wood and wood based industries comprises manufacturing of furniture, plywood from veneer etc. On the other hand, photocopier shops, photographic studio's and other small shops constitute the sub-sector of trade industries. Service related industries form another important sub-sector. It comprises repairs mostly motor repairs, and services of transport operators. The important sub-sector is agro-based industries. It comprises fruit processing units and rice de-husking units. The engineering industries include forging and moulding industries. They also include wire fabrication units and wire drawing units. Industries based on minerals mostly include stone crushing, bricks making, candle making and cement manufacturing. The sectoral analysis of investment as presented in table-14 reveals that wood and wood based product category attracts highest level of investment (53.25 per cent) followed by service sub-sector (16.53 per cent), agro-based industries (13.21 per cent) and mineral based industries (7.15). Other sectors attract small proportion of investment for industrial activities.

## **SMALL SCALE INDUSTRIAL DEVELOPMENT IN ARUNACHAL PRADESH**

Ever since the planning era, the efforts of the government were mainly confined to the promotion of traditional handicrafts, handloom and village and cottage industries. With the sustain efforts of the Government, the small Scale and cottage industry achieved significant growth in the State of Arunachal Pradesh. In order to asses the performance of the small scale industries we have considered three basic parameters- the number of units, employment and total annual production over three points of time during 1990 to 2000. The changes that have occurred over the time in each of these in Arunachal Pradesh are recorded in table -15. The table shows that (i) the number of SSI units has risen over the years; as compared to 1990, the number has increased more than eleven times in 2000; (ii) total annual production has also registered a continuous increase; as compared to its level in 1995, it has increased almost five times in 2000; (iii) as compared to 1990, total employment of SSI units has increased a little more four times in 2000;

Table-14 : Sector and District wise Distribution of Investment in Arunachal Pradesh

( in lakhs)

Districts	Products										Total
	Weaving & Textiles	Wood & Wood	Trade	Services	Printing	Engine- ering	Agro Based	Mineral Based			
Lower Subansiri	1.67	82.33	1.50	17.91	4.82	38.63	84.49	3.00			235.35
West Siang	1.20	26.50	2.00	4.00	2.70	15.20	30.00	5.00			86.60
Dibang Valley	-	55.15	-	1.14	-	-	4.16	-			60.45
East Kameng	-	246.05	-	162.47	1.89	12.31	-	58.49			481.21
Tawang	-	-	-	8.45	1.20	2.30	3.92	-			15.87
West Kameng	2.50	49.53	2.41	4.51	-	7.76	15.30	10.70			92.71
Changlang	-	179.84	-	-	2.42	17.91	19.74	8.71			228.62
Total	5.37	639.40	5.91	198.48	13.03	94.11	158.61	85.90			1200.81

Source: Tata Consultancy Service (1997), *Perspective Plan for Arunachal Pradesh Phase- II*, Table No. 4.3, p. 4-4.



(iv) the average size of employment per SSI unit has declined over the years; it has declined from about nine persons per unit in 1990 to about four persons in 1995 and further declined to three persons per unit in 2000<sup>6</sup>; (v) SSI units are mainly concentrated in four districts namely Lower Subansiri, East Siang, Lohit, and Papumpare.

It is to be noted that significant percentile change as observed in the number of registered units, in employment and in total value of production of SSI units is mainly due to the low base values. Being the major industrial activities of the State, the growth of SSI units cannot be treated as impressive one. Among the small scale industrial activities in the state, sericulture and handicrafts together comprise the major industrial activity. Four important varieties of silk are produced in the State: Mulberry, Eri, Muga and Oak Tasar. In 1999-2000, there are 27 sericulture demonstration centers in the state including 222 sericulture village and 20 reeling units. In terms of number of rearers, the silk variety Eri occupies first place (3620), followed by Mulberry (1394), Muga (125) and Oak Tasar (30). Moreover, Arunachal Pradesh is having rich heritage of traditional handloom and handicraft activities. In 1999-2000 there are 88 crafts centers in the State. During last thirty years, the annual out-turn of craft centers was raised at an average annual rate of 23.81 per cent from Rs. 3.49 lakh in 1970-71 to Rs. 27.59 lakhs in 1999-2000. The sale proceeds of Emporium and Showroom cum Sales Counter have increased at an annual rate of 34.14 per cent from its very low level of Rs. 2.89 lakhs in 1970-71 to 31.50 lakhs in 1999-2000.

#### **AGRICULTURAL AND NON-AGRICULTURAL ENTERPRISES**

The Directorate of Economics and Statistics, Government of Arunachal Pradesh so far conducted four Economic Censuses (1977, 1980, 1990 and 1998). These census reports reveal the structure and characteristics of the agricultural and non-agriculture enterprises in Arunachal Pradesh. Agriculture enterprises are those engaged in any of the activities relating to livestock production, agricultural services, trapping and game propagation, forestry, logging & fishing. While, the non agricultural enterprises are those which are engaged in any of the activities pertaining to (i) mining and quarrying (ii) manufacturing (iii) electricity, gas & water (iv) construction (v) whole sale trade (vi) retail trade (vii) restaurants & hotel (viii) transport (ix) storage and ware housing (x) communication (xi) financial insurance, real estate, and business services (xii) community, social and personal services and (xiv) other activities. As per Fourth Economic Census, 1998, there are altogether 20,69 enterprises in the sample. Out of which 200 i.e. 0.97 per cent are engaged in agricultural activities while the remaining 20,493 i.e. 99.03 per cent are engaged in non-agricultural activities. Moreover, out of total employment of 80,536 persons, 733 persons (i.e. 0.91 per cent) are engaged in the agricultural sector while remaining 79,803 persons (i.e. 99.09 per cent) are usually working in non-agricultural sector. So far as activitywise participation of enterprises is concerned, the highest participation is observed in the activity group retail trade having 44.85 per cent (9190 in numbers) followed by the activity group community, social and personal services having 32.56 per cent (6672 in numbers). The lowest participation is found in the activity group mining and quarrying being only 0.11per cent (3 in numbers).

**Table-15 : Growth of Small scale Industries in Arunachal Pradesh**

Districts	No. of Units Registered as on		Total No. of Employment		Total annual production		(Rs. In lakh) 31.3.2000	
	31.3.1990	31.3.1995	31.3.2000	31.3.1990	31.3.1995	31.3.2000		
Tawang	10	92	223	23	428	709	3.20	235.47
West Kameng	23	216	169	228	641	622	5.84	294.52
East Kameng	2	92	145	64	105	345	11.80	131.91
Papumpare	-	244	1088	-	1501	3968	350.00	3334.04
Lower Subansiri	57	485	667	470	1000	114	1.00	128.09
Upper Subansiri	12	160	213	93	150	480	15.00	37.01
West siang	64	370	260	545	425	1160	120.39	541.21
East Siang	39	324	481	330	1275	1095	70.50	3094.91
Upper siang		21	132		75	245	10.00	850.91
Dibang Valley	77	322	250	443	1767	602	656.59	1478.38
Lohit	93	441	477	690	2177	1841	1185.70	2103.06
Changlang	22	123	283	476	2000	2056	580.00	3145.05
Tirap	16	256	306	249	761	1801	712.10	2212.88
Arunachal Pradesh	415	3146	4694	3611	12305	15038	3722.12	17586.92

Source: Statistical Abstract, 1990,1995,2000, Directorate of Economic and Statistics, Government of Arunachal Pradesh

## **PUBLIC SECTOR INITIATIVES TO INDUSTRIALISATION IN ARUNACHAL PRADESH: A TESTIMONY OF FAILURE**

In the first two and half decades after independence, the Government of Arunachal Pradesh did not take any major initiative for industrial development in the state. Efforts for industrialization initiated only in 1970's. However, due to its geographical location, poor physical infrastructure, under developed markets and demand constraints, the State could not attract much private investment for her industrialization; the public sector had to play the leading role in this regard. Public sector initiatives so far undertaken for industrialization in the State can broadly be divided into two groups: State sponsored schemes and programs and Centrally sponsored schemes and programs<sup>7</sup>.

Among the State sponsored programs, the first bold step towards industrialization has been the establishment of Arunachal Pradesh Forest Corporation (APFC) in 1977 under the Company Act, 1955. Since its inception APFC has undertaken a number of industrial ventures e.g. establishment of saw mills, veneering mills, Plywood industries etc. In the field of cash crop cultivation, the corporation raised coffee plantation, cardamom plantation and tea plantation. However, almost all the industrial units set up by APFC (of course, excepting a few) are reported to have been running under loss in recent years. The situation has become worse after the Supreme Court's Verdict on December 12, 1996 imposing restrictions on the exploitation of timber and timber products. Many forest based industries established by APFC have forced to closed down due to recurring loses in recent years.

The boldest step towards industrialization was the establishment of Arunachal Pradesh Industrial Development and Finance Corporation (APIDFC) in 1978. This Corporation was established with a view to act as a catalytic agent of industrialization by extending finance to small scale entrepreneurs, organizing training program for skill formation & entrepreneurial development and developing marketing network. APIDFC directly established a number of medium sized plants: a cement plant, a T.V assembling plant, a roof sheet unit, a printing press, a furniture unit, a raw material bank and a few others. However, due to the absence of any financial discipline, commercial competitiveness, undeveloped marketing network, unskilled workforce etc. APIDFC failed to function efficiently to achieve the desired goals. In effect, a number of industrial ventures undertaken by APIDFC started yielding negative balance and subsequently some of these plants became economically unviable and forced to close down like Mini Cement Plant at Tezu, Arunachal Pradesh Horticultural Processing Industries Limited (APHPIL) at Nigmoi etc.

Over the years due to recurring loses, all the public sector Corporations namely APFC, APIDFC and APDMTC, which were to play the pioneering role in the industrial development of the State, have been reeling under the burden of heavy financial debt. They have lost their effectiveness and created huge liabilities to the Government. As a result, in a restructuring move, the Government of Arunachal Pradesh in a Cabinet meeting on May 31, 2002 decided to close down all these three Corporations<sup>8</sup>. It is reported that APFC was having maximum Rs. 9.9 crores negative balance, APIDFC having 57 lakhs and APMDTC Rs. 1400 negative balance (Arunachal Times, June1, 2002). This decision of closing down all the three Corporations marked an end of the well-planned vision of industrial development through public sector undertakings in the State of Arunachal Pradesh. It is to be noted in this context that in a counter move the employees

of all these three Corporations had gone to the court for justice against the Cabinet decisions. Till date the matter is under judicial verification, and all the three Corporations are still operative in the State.

In view of the unsatisfactory performance of the public sector units, the Government of Arunachal Pradesh announced the New Industrial Policy 2001 with a new thrust to industrialization: "(i) the state government will encourage the establishment of industrial undertakings in the private and co-operative sectors for the sustainable development of the state. (ii) investors from outside the state will be encouraged to invest in the State. Hundred percent equity ownership of an industrial unit by entrepreneurs will be allowed for a maximum period of thirty years by the end of which, such equity holding will be reduced to 49 per cent, the remaining 51 per cent will be held by local Arunachal tribal entrepreneur or a group of local entrepreneurs or the state government, if it considers necessary to do so. (iii) outside entrepreneurs may be allowed to hold land on lease for a period of thirty years, after which the lease may be renewed for a further period of thirty years. (iv) development of all kinds of industries will be encouraged. To begin with, the following industries will have priority: (a) industries based on agriculture, horticultural and plantation produce; (b) industries based on locally available raw materials; (c) textile (handlooms and power looms) and handicrafts; (d) electronics and knowledge based industries; (e) industries based on non-timber forest produce; and (f) infrastructure such as power and communication"(Industrial Policy, 2001).

## **RESOURCE-INDUSTRY INTERLINKAGES**

Several studies have been conducted so far to assess the natural resource endowment and industrial potential in Arunachal. The studies by NCEAR (1967), TCS (1997), IIE (1996) have identified several resource base industries that would have tremendous potential for development in the State. The broad industrial categories as identified by these study groups are:

- (i) agro-based industries such as agricultural processing industries.
- (ii) industries based on forest, horticulture and plantation
- (iii) commercial production of hydro-electricity
- (iv) mineral based industries &
- (v) development of tourism industry.

However, there is a big gap between potential industrial options and actual achievements in the State of Arunachal Pradesh. In spite of having tremendous potential for resource based industrialization, Arunachal Pradesh is one of the least industrialized States in India. One of the reasons may be that Arunachal Pradesh has started late in the process of planned economic development. The first industrial policy aiming at all-round industrial development has come only in 1994. The New industrial policy 2001, which is under operation, is the second in the row.

There are several dimensions to inter-sectoral resource flows. The direction and magnitude of resource flows between agricultural and non-agriculture is an important determinant of the pattern of development. Agriculture is the pre-dominant economic activity in the State. Agriculture and industry are expected to act complementary to each other for overall development of the economy. Agriculture and industry linked most obviously through the provision by former to the latter of surplus at the beginning of the

development process. Agricultural productivity and surplus generating capacity of the state is low. As a result, agricultural input supplying and output using industries have not come up in the State. There is a dire necessity of agricultural resource base industries in the State. The poor linkage between agriculture and industrial activity has led to slow down the overall rate of growth of the economy.

The broad pattern of industrialization in the State has been the mere extension of forest extraction activities. Out of 18 medium scale industries in the state barring three (one mini cement plant at Tezu, one horticulture processing industry at Nigmoi, and a tea industry at Pasighat) all the fifteen medium scale industries are forest resource based like saw mills, veneering mills and plywood industry. After the imposition of ban imposed by Supreme Court, the prospect of forest based industries received a serious set back; a number of saw mills and veneering mills have closed down in recent years. The lone mineral based cement industry at Tezu had a life span of only eleven years. It was sick and running under lose and finally closed down in 1995. The horticulture processing industry, which was established in 1982, also shut down in 1995. Other than forest based industry, resource based manufacturing activities in the State include stone crushing, flour milling, candle manufacturing, aromatic oil extraction, and agro-processing.

The geo-climatic condition of the state is conducive for the development of horticultural products. But, the horticultural product based industries like orange squash, pineapple squash and slices, canned mushroom and bamboo shoots, jam-jelly, dried ginger and ginger powder, spices floricultural and horticultural garden, tissue culture etc, did not make much headway in Arunachal Pradesh.

Tourism has been declared as an industry in the State. With picturesque landscape, turbulent rivers, deep gorges and lofty mountains, snow-clad peaks, thousand of species of flora and fauna, Arunachal Pradesh presents ample scope for the development of tourism industry. There are a number of important tourist spots in the State like wild life sanctuaries at Namdapha, religious and historically important places like Tawang (Buddhist Monastery), Parasuram Kund (Tezu), Malinithan, the places of scenic beauty like Tawang, Bomdila and Tipi, adventurous tourist places like Along, Zero, Bhalukpong etc. Tourism industry in the State is still in the nascent stage. Infrastructure for the development of tourism industry like hotel, road, transport, communication, etc. has not yet been developed in the State. Only in the ninth plan the Government of Arunachal Pradesh has undertaken a comprehensive master plan for the development of tourism industry in the state.

Thus the State has failed to translate the vast resource base of the region into productive industrial activities. This has led to a very low efficiency of State resources and resource-industry interlinkage has been found to be very weak. The industrial activities in the State have been carried out without generating much forward and backward linkage in economic activities. The main constraints strangling industrial growth of the State are:

**Infrastructural Facilities:** One of the important constraints in the development of industries in Arunachal Pradesh has been an utter lack of infrastructural facilities like proper land, transport and communication, power, banking facilities, schooling, health and medical care etc. and a consequent absence of a proper investment climate in the State. In the absence of these, it becomes difficult to provide the necessary logistic support to industrial activities. The lack of these basic industrial infrastructures discourages entrepreneurs coming from outside.

**The flow of Fund:** The flow of investible fund in Arunachal Pradesh is very poor.

The availability of institutional finance to this sector has not been commensurate with their needs nor in proportion to the volume of activity generated by the sector. In fact, it is conceded that inadequate finance has been one of the major causes for industrial sickness in the State. The financial agencies are not coming up to finance industrial activities because of the poor recovery rate.

**Technology:** The state of industrial technology in Arunachal Pradesh is very poor. The development and application of technology appropriate to the local conditions has been very limited in Arunachal Pradesh. Identification of technology needs and delivery mechanisms for existing technology are virtually non-existent in the State. Entrepreneurs shy away from technologies that are high risk, not cost effective or that involve high transfer costs. It is to be noted here that local resource based small scale industries can survive only if they are in a position to meet the market demand, on the basis of technological efficiency and low costs.

**Marketing infrastructure:** Marketing has been considered as one of the critical constraints faced by the industrial units in Arunachal Pradesh. Arunachal economy is still in the transitional phase. Different communal economies of the state are in the process of integration with the market economy. The competitive and efficient market structure that is necessary for economically viable industrial activities is almost non-existence in the State. Moreover, marketing network with the neighboring States has not been developed much because of poor transport communication system. On the other hand, the size of the local market is very narrow in Arunachal Pradesh. The products are mainly produced to absorb the local demand. Any surplus generated in the process creates the problem of disposal. The marketing support given by the government and some government agencies has been found to be limited to only a few products like handlooms, handicraft and some of the products of village and khadi industries. However, the proportion of the produce marketed through these agencies is also very limited.

**Inner line regulation:** The British Policy of isolating the hill people from the plain, which was implemented through the Inner Line Regulation Act 1873, is still in operation in Arunachal Pradesh. The spirit of innerline regulation is that employment of migrants should be discouraged or at least minimized in Arunachal Pradesh. As an automatic corollary of Inner Line Regulation, is the restriction on the free flow of goods and services in Arunachal Pradesh. In the absence of locally available enterprising man-power, this regulation has in fact imposed restrictions to industrial activities in the State both by contracting factor as well as commodity markets. In the presence of Inner Line Regulation, the industries that require mainly migrant labourers and marketing outside the State need to be discouraged.

**Property Rights:** The indigenous populations of Arunachal Pradesh have got the exclusive property rights in land. The outside entrepreneurs cannot purchase any land for industrial purpose. This type of land tenure system in Arunachal Pradesh is acting as a major obstacles to resource base industrialization in the State specially plantation based industries like horticulture etc. that requires large tracks of land. Unless the land laws for setting up industrial units are relaxed, industrialization in Arunachal Pradesh will continue to suffer.

**Lack of Tribal Entrepreneurship:** Entrepreneurship and skills so necessary for success in industrial ventures are mostly conspicuous by their absence in Arunachal Pradesh. With the growth of secondary and tertiary sectors of the economy some

entrepreneurship has come into being, but non-locals or migrant people has provided a greater part of this entrepreneurship. Arunachalee element in the whole spectrum of entrepreneurship is very insignificant. Lack of education and training facilities for imparting technical and managerial skills have come in the way of development of local entrepreneurs. Moreover, the local people have shown a tendency not to face the competition of the market aggressively. They are risk avoider and hire out their license, building, machinery etc. to the outside entrepreneurs and they collect mainly the rent and interest. As a result most of the existing industrial and business venture are being operated by non-locals, but on paper they are owned by the tribals (Roy and Kuri, 1998). Only in recent years some local people started taking interests in business ventures and a neo-merchant class of local origin has tended to emerge in the State.

### **ROLE OF THE MARKET AND STATE**

The proximity of market is an important pre-requisite to industrial development. Because of the late starter in the process of economic development, the market, an important institution of modern industrial societies is underdeveloped in Arunachal Pradesh. The lack of proper market infrastructure acts as a disincentive to the producers to generate any surplus production. The productions are organized mainly to fulfill the home demand or in accordance with the demand in the local markets. Any surplus generated in the process goes mostly waste as it cannot be marketed outside the locality due to poor transport and communication system. There are only few regulatory markets in the State. The market supporting infrastructure like cold storage, warehouses, godown etc. has not yet been developed in the state. Unless the marketing infrastructure is created the industrial sector will continue to remain undeveloped in the State.

There are many areas where the government should encourage investment and creation of markets. The importance of market has been multiplied in recent years because of the ongoing process of liberalization and globalization of the national economy. There cannot be anything like selective liberalization or partial globalization except when one wants to protect a preferred community. At least in the present state of the economy where a large number of people have been struck in the road to development, it is government's duty to attract the internal and external capital to energies the rural economy, aggressively penetrate the economy of the surrounding States and country, and keep competition on its main agenda. It must create opportunities for local people not only in terms of creating jobs but also in undertaking business venture.

Given the low level of entrepreneurship, underdeveloped marketing infrastructure and low skill base of the state, Government would have to play a pioneering role in fostering industrial growth in the State. For industrialization, the role of the Government can be of three folds: promotional role, developmental role and regulatory role. The promotional role is to be performed by the State by providing the various direct incentives, such as cash subsidies, tax concession, building of infrastructure, provision of financial assistance etc. and indirect incentives like provisions of an environment conducive for investment in the industrial sector. The developmental role includes the preparation of industrial policy, identification of thrust areas and announcement of incentive package to attract investment in the industrial sector. To overcome the industrial sickness, appropriate revival packages are to be effectively implemented to revitalize the industrial sector of the State. The Government should undertake entrepreneurship development

programmes and provide technological training through establishment of industrial training institutes, polytechnics, and engineering colleges. It must also co-ordinate with banks and financial institutions to help entrepreneurs in getting loans and finances. As a regulator, the Government must apply rules so that industry does not conduct itself in a manner that is prejudicial to the interests of the society. The State needs to come forward to protect the interests of small investors and bankers by checking defaults and misappropriation of funds by the management of public and private sector companies.

### THE CONCLUDING REMARKS

Agriculture is the dominant economic activity in Arunachal Pradesh. Even after more than thirty years of economic planning, the primary sector constitutes to claim substantial proportion of the workforce and income in Arunachal Pradesh. However, the structural transformation is found to be biased towards the development of service sector. In spite of having tremendous potential for resource-based industrialization, the secondary sector has failed to make any significant headway in the State. Notwithstanding the definite and determinant role that agriculture has in the process of economic development, it is to be borne in mind that industrialization alone can cause the creative structural disequilibrium necessary for achieving the higher level of output and employment. Economic development in the modern sense cannot be conceived without reference to industrialization that involves an inevitable shift away from the primary sector to the secondary and tertiary sectors. Since it is desirable to have a balanced development of both the primary and non-primary sectors in the process of economic development, it is necessary to develop the secondary sector deliberately so as to initiate and accelerate the structural change necessary for attaining higher level of development.

The State is endowed with rich natural resources, but is still economically underdeveloped. The State's efforts for resource-based industrialization have not been fructified into any noticeable success. The available vast potential of agriculture, horticulture, forest and hydel power demands a comprehensive approach for the creation of a climate conducive for industrial development in the State. However, as mentioned above, the industrial options of the State are constrained by many factors and the operational hindrances arising out of these constraints have brought about a situation of *low level equilibrium trap* in industrial activities. Under the circumstances, the Government will have to provide a *big push* to break this *trap*. For this, first of all, there is a need for sectoral adjustment in the State plan, more allocation are to be provided to the industrial sector. Only after the creation of necessary industrial infrastructure, the State will be able to attract the private investment for industrialization. The State's infrastructure and resource endowment should be developed in areas comparatively better suited for investment. In the present state of the economy, if the Government does not play the instrumental role, the prospect of resource-based industrialization in the State will remain merely as a theoretical possibility for years to come.

Since independence the industrialization in the State has mainly been confined to the development of small scale village industries. The policies and programmes towards the development of these industries so far have been passive and protective. No thrust has been given on the modernization and diversifications of industrial activities. Initiatives for medium scale resource based industrialization have not been succeeded mainly due to the lack of industrial infrastructure and ineffective market forces. Moreover, industrial



activities in the State have failed to generate much inter-sectoral linkages in economic activities. In effect, the State of Arunachal Pradesh has been passing through a prolonged phase of *industrial recession*. In view of the current industrial sickness of the State, the concerted efforts must be made by the government to improve the efficiency and productivity of the industrial units. This can be achieved by a series of measures that include, first and foremost, a revamping of management and management objectives. In the absence of private investment, the Government must act as a facilitator to the industrial development. In this context, it may be mentioned that three public sector Corporations namely APIDFC, APFC and APMDC are to be revived, restructured and provided with greater autonomy to undertake industrial venture in the State. On the other hand, the industrial policy of a State has a direct bearing upon the functioning as well as the growth of industries. The new industrial Policy 2001 provides a wide range of incentives aimed at promoting industrial growth in the State. Enhancement of supply of infrastructural facilities, establishment of more industrial estates etc. is commonly held priorities in the State. Initiatives have to be taken to shift the priority from physical domain to the institutional domain. Appropriate institutional reform can bring about economic efficiency in the use of resources and act as the most potent force of development in Arunachal Pradesh.

### Notes

1. The contribution of agriculture to state income has steadily declined in Arunachal Pradesh (appendix table- II). On an average the contribution of agriculture to state income has declined at the rate of 0.26 percentage points per annum while the contribution of forestry declined at the rate of 0.48 percentage points.
2. In the secondary sector, manufacturing and construction are two main sub-sectors. The contribution of construction sub-sector to state income has declined at the insignificant rate of 0.04 percentage points. On the other hand, the contribution of manufacturing sub-sector to state income has increased at the insignificant rate of 0.15 percentage points per annum. As a result the contribution of the secondary sector tended to increase at the insignificant rate of 0.09 percentage point per annum over the 30 years period. Of course, there are decadal fluctuations to these results (appendix table-II).
3. In the tertiary sector, trade is an important sub-sector, which has grown at the significant rate of 0.10 percentage point per annum during 1970-71 to 1999-2000 (appendix table- II).
4. Clark (1940) and Fisher (1939) provided one of the earliest, but still persuasive hypothesis on the development of service sector. They argued that countries could be expected to move mainly from primary to secondary and secondary to service production during the period of economic development. Because high-income elasticities are associated with many service activities, it is argued that this sector only becomes large after the basic necessities of the primary sector are provided and most demand for manufacturing goods are satisfied. This process as come to be known as the Clark-Fisher hypothesis. However, many sectoral theorists including Bour and Kamey (1965) questioned the validity of the Clark-Fisher hypothesis. They argued that such generalization is erroneous and misleading. Arunachal Pradesh, for example, is a case where there has been overlapping development of the tertiary sector. Tertiary sector developed at a faster rate than the secondary sector during the period of structural change of the economy.
5. In the calculation of per capita forest resource in Arunachal Pradesh, satellite imaginary data for forest area has been used while population figure has been taken from the latest population census, 2001. While, in the calculation of per capita forest area of the autochthons, tribal population figure has been taken from census 1991. This is because final census report 2001

containing decomposition of total population into tribal and non-tribal category is yet to be published.

6. The size of the employment per unit has been calculated with respect to total registered small scale units. It is to be noted that at present more than fifty percent of these registered units are not functioning. So, the size of the employment per operative unit is much higher than that has been given in the text. For example, on 31.03.02, out of 4694 registered units, 1764 units are functioning with an average employment of nine persons per unit. But, one point is true that over the years the average size of employment per unit has shown a declining trend.
7. Two important centrally sponsored schemes that have been implemented in Arunachal Pradesh are: the establishment of Industrial Estates (IE) and District Industries Center (DIC). Industrial Estates have been established to attract new industries in the state since 1977-78. These IE's offer developed land, constructed sheds, power, developed road, banking facilities and other infrastructure that is essential to promote the establishment and growth industries. As on 31.03.2000, there are 14 industrial estates spreading over 10 districts of the State. In East Kameng, West Siang and Upper Siang there are no Industrial Estates. On the other hand, DIC's were introduced in the state in 1978 to assist tiny cottage and village industries. During the eighth plan this DIC scheme was transferred to the State. Apart from these two schemes, a number of other centrally sponsored schemes like Central Investment Subsidy Scheme, Central Transport Subsidy Scheme, Central Infrastructure Assistant Scheme, Establishment of Export Promotion Industrial Park, establishment of Colled Rolled Steel Plan, etc. were introduced in Arunachal in various plan periods. However, the success records of these centrally sponsored schemes are not satisfactory in the State.
8. More than 500 employees would be affected due to the proposed decision of the closer of these three corporations. However, Cabinet decided to extend the facilities to the-employees under Voluntary Retirement Scheme (Arunachal Times, June 1, 2002).

## APPENDIX

**TABLE-I : Relative Per capita Income (RPI) of States of India and Union Territories**

States/Union Territories	RPI 1980-81	Rank	RPI 1990-91	Rank	RPI 1997-98	Rank
Arunachal	87.41	20	97.50	12	92.25	15
Assam	76.32	27	82.60	23	62.69	26
Monipur	80.17	25	72.91	26	71.25	23
Meghalaya	88.32	19	92.15	17	75.37	20
Mizoram	80.34	24	90.51	19	91.82	17
Nagaland	92.29	17	109.84	9	102.72	11
Tripura	94.47	14	79.03	24	68.05	24
Sikkim	88.73	18	97.16	13	89.12	18
Andhra Pradesh	84.25	21	89.76	21	91.94	16
Bihar	58.69	28	55.28	28	43.34	28
Delhi	238.04	2	211.97	1	231.30	1
Goa	183.77	4	166.85	3	191.31	3
Gujrat	119.97	9	118.22	8	133.46	8
Haryana	139.95	7	143.91	5	137.46	7

*contd.*

Himachal Pradesh	104.52	12	97.72	11	93.11	13
Jammu & Kashmir	123.59	8	86.18	22	74.69	21
Karnataka	94.41	15	92.73	16	98.96	12
Kerala	105.38	11	95.24	14	111.09	10
Madhya Pradesh	92.40	16	89.94	20	72.67	22
Maharashtra	143.11	6	141.87	7	151.69	5
Utter Pradesh	80.51	23	73.38	25	63.52	25
West Bengal	110.55	10	94.53	15	92.26	14
Andaman & Nicobar Island	261.18	1	181.33	2	180.06	4
Chandigarh*	-	-	-	-	265.21	-
Pondichary	183.83	3	142.71	6	202.39	2
Orissa	77.64	26	59.01	27	61.63	27
Punjab	150.98	5	152.41	4	148.44	6
Rajasthan	81.78	22	91.01	18	87.57	19
Tamil Nadu	95.68	13	103.27	10	120.89	9
Country	100		100		100	

Notes: (i) RPI denotes state per capita income as percentage of National per capita income  
(ii) \* Excluded Chandigarh in the ranking (for the sake of comparison).

Source: Economic Survey 2000-2001

**TABLE-II : Structural Transformation in Arunachal Pradesh : Linear time trend of the sub-sectors of the Economy**

Activities	1970-71 to 1999-2000	1970-71 to 1979-80	1980-81 to 1989-90	1990-91 to 1999-2000
Agriculture	A=40.49-0.26t Â =36.49 R <sup>2</sup> =0.39	A=39.49-0.24t Â =38.17 R <sup>2</sup> =0.09	A=36.12-0.40t Â =38.33 R <sup>2</sup> =0.28	A=37.86-0.89t Â =32.98 R <sup>2</sup> =0.68
Forestry and logging	F=19.85-0.48t F=12.40 R <sup>2</sup> =0.72	F=25.53-1.08t F =17.62 R <sup>2</sup> =0.75	F=12.92-0.33t F=11.11 R <sup>2</sup> =0.15	F=11.76-0.80t F=8.48 R <sup>2</sup> =0.32
Manufacturing	M=1.70+0.15t =4.01 R <sup>2</sup> =0.02	M=0.91+0.09t =1.41 R <sup>2</sup> =0.76	M=4.38+0.26t =5.82 R <sup>2</sup> =0.30	M=7.05-0.41t =4.80 R <sup>2</sup> =0.70
Construction	C=18.73-0.04t C=18.12 R <sup>2</sup> =0.02	C=18.33+0.16t C=19.21 R <sup>2</sup> =0.03	C=18.34-0.30t C=16.75 R <sup>2</sup> =0.17	C=18.17+0.04t C=18.41 R <sup>2</sup> =0.002
Trade	T=3.05+0.10t =4.62 R <sup>2</sup> =0.69	T=1.69+0.36t =3.67 R <sup>2</sup> =0.87	T=3.92+0.13t =4.61 R <sup>2</sup> =0.86	T=5.68-0.02t =5.57 R <sup>2</sup> =0.02

Notes: 'A' stands for proportion of agricultural income to state income  
'F' stands for proportion of forestry and logging income to state income  
'M' stands for proportion of manufacturing income to state income  
'C' stands for proportion of construction income to state income  
'T' proportion of income from trade to state income

Source: Linking series Estimates of SDP of Arunachal Pradesh: 1970-71 to 1999-2000, Directorate of Economics and Statistics, Government of Arunachal Pradesh Itanagar.

**Table-III : Minerals Deposits in Arunachal Pradesh**

SL. No.	Minerals	Reserves (Million tones)	Location
1	Coal	84.23	Namchick, Nampbuk, Changlang District
2	Dolomite	154.13	Rupa, Kaspi, Chilipam, Dedza, Jarain, West Kameng District (In addition, specific locations of the occurrences of dolomite have been found in Siang river and in between Pasighat and Pangin. However, reserves not yet been estimated).
3.	Lime stone	409.35	Pangen-Boleng, East Siang District, Tiding, Lohit District, Humli, Dibang Valley, Menga, Upper Subansiri District
4.	Graphite	3.26	Bopi, Khetabari, taliha, Upper Subansiri District (a preliminary estimate indicates that the reserve of graphite rock near tail village is West Siang may even go up to 10.35 MT)
5.	Marble	76.12	Tezu, Lohit District, Dora river Humli, Pyuli, Dibang vally,
6	Crude Oil	30	Khunchali Jairampur, Kharsang, Changlang District
7.	Natural gas	Exact quantities have not yet been ascertained. However 30 million cubic meter of natural gas are extracted annually.	Kharsang, Kunchi, Changland District
8.	Sulphide	Not yet estimated	Potin, ranga Valley
9.	Pyrito	Not yet estimated	Potin, ranga Valley
10.	Mineral water	Not yet estimated	Various places throughout the state
11.	Lead Zink	Not yet estimated	Shergaon, West Kameng, Namchick, Nampbuk, changland District
12.	Quartzite	3.13	Kalak tang, Kameng District
13.	Rock Minerals, Glass, Sand, Lime Stone and Marbles	Not yet estimated	Tenga Valley, Teja Valley, Dora river
14.	Gold	Not yet estimated	Subansiri and Dikrong
15.	Iron Ore	Not yet estimated	Yomcha and adjacent areas
16.	Clay	Scanty data available	Yazali and adjacent areas

Source: Arunachal Pradesh Mineral Department and Trading Corporation Limited and Draft tenth five year plan, Government of Arunachal Pradesh

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## **Supplementary Observation**

### **Changing Pattern of Industrialization in Arunachal Pradesh : Some Basic Issues**

**— M.A. Salam**

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Development can be understood as a process of expanding the real freedom enjoyed by the people (Sen, 1999). Development requires the removal of major sources of unfreedom, for instance,

- Economic poverty, which begets hunger, malnutrition, inadequate clothing and sheltering and lack of basic sanitary facilities;
- Lack of opportunity in regard to get education, to go for employment as per choice and availability of health facilities;
- Socio-cultural-political tyranny.

All these unfreedom can be reduced to two sets of unfreedom besetting to the people where, (i) they live, i.e., to their self-being and (ii) they work, i.e. to their agency.

Hence the development is a process of growth of income and over all change. This change entails the transformation of society over the stages in whatever way we like to perceive:

- Traditional, pre-requisites, take-off, drive to maturity, mass consumptions.
- Pre-capitalist, capitalist and post-capitalist.

Development, therefore, cannot be equated conceptually with rise in per capita income or with industrialization, or with acquisition of technology, or with modernization. Nevertheless in this paper we take the growth of per capita income as a close equivalence of development for two reasons: (i) to corroborate the proposition with some empirical data and (ii) growth rate is a necessary condition for expanding the freedom enjoyed by the people. And we take industrialization not as an end in itself but a strategy to have better growth rate.

Table 1 is self-explanatory. In Arunachal Pradesh growth rate has been recorded systematically from the 4th plan onward. The performance of the economy has picked up from the seventies. It was satisfactory during the 1980s and the 1990s. The decadal growth rate of the three subsequent decades were 61.5%, 78.7% and 74.9%, while the per capita

Table I

Years	Growth (%)	Per capita growth	Plan wise growth (%)	Per capita (%)	Decadal Growth (%)	Per capita (%)
1970-71	-	-	4th Plan (1969-70 to 1974-75) 4.3	1.0		
1971-72	7.7	4.2				
1972-73	1.7	-1.5				
1973-74	3.2	-0.2				
1974-75	4.5	1.3				
1975-76	4.4	1.2	5th Plan (1975-76 to 1979-80) 8.9	5.8		
1976-77	12.2	8.9				
1977-78	18.1	14.6				
1978-79	13.6	10.6				
1979-80	-3.9	-6.3				
1980-81	6.2	5.0	6th Plan (1980-81 to 1984-85) 8.3	5.3	6.15	3.27
1981-82	15.2	11.2				
1982-83	3.4	0.4				
1983-84	7.1	3.7				
1984-85	9.6	6.4				
1985-86	12.8	9.4	7th Plan (1985-86 to 1989-90) 7.4	4.1		

contd.

Table 1. (Continued)

Years	Growth (%)	Per capita growth	Plan wise growth (%)	Per capita (%)	Decadal Growth (%)	Per capita (%)
1986-87	6.8	3.5				
1987-88	6.5	3.2				
1988-89	8.2	4.8				
1989-90	2.9	-0.4				
1990-91	18.4	14.6	16.3	12.9	7.87	4.72
1991-92	14.3	11.2				
1992-93	2.6	0.0	8th Plan (1992-93 to 1996-97)	5.2		2.7
1993-94	14.4	11.8				
1994-95	0.4	-2.0				
1995-96	14.8	12.1				
1996-97	-6.0	-8.4				
1997-98	3.2	0.7	5.3	2.2		
1998-99	0.9	-3.4				
1999-2000	11.9	9.7			7.49	4.63

Source: Linking series estimates of state domestic product of Arunachal Pradesh 1970-71 to 1999-2000(Q), SDP Section, Directorate of Economics and Statistics, Government of Arunachal Pradesh, Itanagar.



decadal growth rate for the same periods were 32.7%, 47.2% and 46.3%. Provided that the poverty line has not gone up on the scale of population distribution and the gini coefficient has not increased then one can safely decipher from the table that at least the material requisites of the well-being in the state has been doubled in every 15 years. In other words, the people of Arunachal Pradesh are enjoying the higher range of economic freedom over the periods of time.

Industrialization is a process whereby the structural transformation in the economy takes place. It takes place in two accounts: (a) the proportion of the total income from non-agricultural sector increases; (b) there is a shift of working population from agricultural sector to non-agricultural sector (Bagchi 1988). Tables 2 and 3 reveal the facts about the industrialization in Arunachal Pradesh.

From Table 2 we get the impression that the relative importance of primary sector goes down over the plan periods and the relative importance of secondary sector remains almost the same. And the tertiary sector has gained. From Table 3 we receive the information that there is a considerable shift of the working force from agricultural activities to non-agricultural activities. Agricultural sector was engaging around 80% of the total work force in 1971, which has gone down gradually, i.e. 69% in 1981 and 64% in 1991. The trend approves that industrialization and structural transformation are taking place in the economy of Arunachal Pradesh.

Table 2

(Rs. in lakh)						
Sector	4th Plan	5th Plan	6th Plan	7th Plan	8th Plan	9th Plan (upto 2000 only)
Primary Sector	32920 (58.21)	53065 (55.41)	74986 (50.10)	116021 (51.82)	187282 (46.33)	99398 (36.27)
Secondary Sector	11785 (20.84)	18724 (19.55)	30617 (20.45)	42462 (18.97)	92731 (22.94)	61268 (22.36)
Tertiary Sector	11848 (20.95)	23979 (25.04)	44101 (29.45)	65402 (29.21)	124213 (30.73)	113391 (41.37)
Total	56553	95768	149704	223885	404226	274057

Figures in bracket indicate percentage.

Source: Linking series estimates of State Domestic Product of Arunachal Pradesh (1970-71 to 1999-2000) (Q), SDP Section, Directorate of Economics and Statistics, Government of Arunachal Pradesh, Itanagar.

### III

Arunachal communities have evolved over the ages. They have made use of natural endowments through expending the communal or individual labour power (as the case warranted). To assist the labour power they have developed indigenous technology. The total produce has been consumed quite often within the community. Hence, every community practiced an elaborate allocational procedure of resources and distributional method of produce (Haimendorf 1980). For a background understanding here we constrict our discussion mainly to understand the modus operandi of the resource flow, i.e. how resources are effected (mobilized and allocated for the production process in pre-independence phase of Arunachal Pradesh).

Table 3

(Numbers in lakh)

Indicators	Census		
	1971	1981	1991
Total workers	2.69	3.33	4.00
Cultivators	2.11 (78.43)	2.23 (66.96)	2.36 (59.00)
Agricultural labourers	0.05 (1.85)	0.08 (2.40)	0.20 (5.00)
Non-agricultural labourers	0.53 (19.70)	1.02 (30.63)	1.44 (36.00)
Total non-workers	1.98	2.99	4.65
Work participation rate (from total population)	57.60	52.69	46.24
Non-workers participation rate	42.40	47.31	53.76
Decadal percentage rise of total workers	-	23.79	20.12
Decadal percentage rise of cultivators	-	5.69	5.83
Decadal percentage rise or agricultural labourers	-	60.00	150.00
Decadal percentage rise of non-agricultural workers	-	92.45	41.81

Source: Economic Review of Arunachal Pradesh 2000, Directorate of Economics and Statistics, Government of Arunachal Pradesh, Itanagar.

Capital may be construed as the portion of resources, which are oriented for carrying the production cycle. These resources may be material (seeds and technology etc.) may be immaterial (technical knowledge, skill and experiences etc.). In pre-capitalist society there is a problem of valuation of these resources in some monetary unit. My contention is that there exists capital at embryonic stage even in pre-capitalist societies, however, in different forms. The essence of capital lies in three functions; it is a productive asset; it affords a control over the purchasing power, it is a fund per investment (Firth and Yamey 1963). Productive assets involve seeds, dao, digging sticks, baskets etc. Control over purchasing power includes grains or cooked food or clothes, which are served to the workers engaged in production operation. It is a type of working capital. And also sometimes these items are transferred to some households and the recipients feel obligation to reciprocate either with the same goods or rendering services later on. Such borrowing (borrowing for consumption) does not yield any interest. If borrowing is to meet the requirements of production operation, lender may share a portion of the produce. Loan is also obtained on mortgaging a land where usufruct goes to the lender. And there is symmetry of power relation in the community with the accumulation of these resources (Elwin 1965). Important thing is that production is done in advance not only to meet the family requirements (consumption goods) but also to meet the production expenditure (capital goods). Hence, adequate amount is accumulated and saved which is invested at various stages of production.

In general society categorizes the items of assets according to the degree of liquidity (Firth & Yamey 1963); food items and other subsistence goods; cattle, clothes and metal objects; ornaments and rights over land.

Further these communities did not leave in seclusion. They used to trade in the market place with other contiguous communities (Das 1995).

Industrialization as a method of development requires deliberate strategy for the backward region. The path towards industrialization is more like an obstacle race than a journey on a highway. It is obstructed by various conflicts and contradictions. Institutional arrangements, cultural pattern, value system, interlinkages of resource flow, power relation etc. come on the way as obstruction. Proceeding at a snail pace rate through bit-by-bit will not generate the same effect as if we generate through giving a single bit of big push, which would overcome such circumstantial constraints. After independence and more specifically after the Sino-Indian conflict, Government has realized and initiated the development process on the line of big push. As a result in a decade a substantial amount of social overhead capital has been formed and it has kept rising in various forms like (i) in the form of infrastructure facilities such as bridges, roadways, other means of communication, power generation etc; (ii) in the form of human social capital through education and health services; (iii) in the form of institutional network such as administrative unity, banking system, etc. Government undertook this project of big push because each one of the aforementioned activities is indivisible, lumpy and requires a long gestational investment. The Table 4 gives the government outlay and expenditure over the plan periods.

One may easily visualize that there is a shift in the strategy of industrialization from the 1970s. Hence in the post independence phase of Arunachal Pradesh we have two strategies of industrialization, however, to a greater extent they are complementary.

### **Strategy upto the 1970s**

The initial phase of industrialization basically involves the development of traditional skill with the use of locally available materials. Hence, the industrial strategy of NEFA was mainly to promote handicraft and village industries. This has two purposes: (i) the people would earn a subsidiary income in addition to the normal agricultural works; (ii) to preserve the indigenous crafts and to help the people to grow in the traditional line through using the local available raw material. Consequently, raw material procurement and production sale units (emporium) and Crafts Training-cum-Production Center (CTPC) has been set up. These two organizations have co-ordinated in imparting trainings and producing the output, and marketing them. Government has provided tools at 50% subsidy and 50% of the cost was to be raised in easy installment either in cash or in kind (finished products supplied by the trainees) during 3 years (Das 1995).

Such strategy is appropriate only during the initial years for the non-monetised underdeveloped region. The craft centers and village industries were producing the output which were required by the majority of people, i.e. goods were not alien to them. They were produced by labour intensive method using the local technology with minimum amount of investment. In strict sense of the term this was not a commodity production because no amount of commodification and alienation are involved. And therefore it carries the germs, which would have defeated the purpose namely market remains stagnant. The sale proceeds hardly cover the costs leaving meagre margin, which does not generate sufficient incentive to go for expanded production.

Table 4

Plan Periods (5-Year Plan)	1st FYP	2nd FYP	3rd FYP	Three Annual Plans (1966-69)	4th FYP	5th FYP	Annual Plan (1979-80)	6th FYP	7th FYP	Annual Plans (1990-91 to 1991-92)	8th FYP
Outlay	3.00	5.01	7.15	8.57	17.99	63.30	23.41	222.90	551.61	375.49	1728.62
Expenditure	2.01	3.57	9.20	8.32	21.58	60.86	22.51	205.85	550.51	372.70	1714.62
Regular employment generated	1774	2444	3269	1665	2970	4588	99	4305	33993	2180	39819

Source: 50 Years Space of Development in Arunachal Pradesh (1947-1997), Directorate of Economics and Statistics, Government of Arunachal Pradesh, Itanagar.

### **Strategy from the 1970s**

Since the 1970s, there has come a change in the industrial pattern of Arunachal Pradesh. There are several reasons which we can be put under two heads: the political reasons, and the economic reasons. During the 60s and early 70s, the underlying assumption of compatibility between growth and employment has been questioned on empirical ground. Hence, growth through industrialization may not create employment and because of concentration and centralization of resources, inequality of individual as well as of regional emerges. Unemployment and regional inequality have a high bargain for the pressure group under democratic set up. As a result Central Government has formulated a policy to develop the backward region through accelerating the rate of industrialization. The North East Region has come under the economically backward region. Further, Central Government has a policy to develop the hilly and tribal regions. And by that time Arunachal Pradesh has received the status of the Union Territory. Hence, the State has enjoyed the advantageous positions on many grounds: (i) being the Union Territory its development project has come directly under the Centre; (ii) Arunachal Pradesh is a part of the NER. Hence the NEC also considers its problems; (iii) Arunachal Pradesh is a hilly state and is inhabited by the various recognized tribes. So it receives the benefits of these two also; (iv) further Arunachal Pradesh enjoys the status of strategic state for its international boundaries. Furthermore, sufficient time has passed and Government has already poured sufficient amount of money in the form of investment in social overhead which has increased the real income of the employees and contractors and so middle class, however thin in numbers, has emerged. And they were creating the demand for industrial produce.

The industrialization phase of the 70s contains three-pronged strategy:

- (i) to develop the industrial estates in the vicinity of urban area through which a firm can enjoy the benefits of external economies and also the benefits of linkage effect in the form of relatively regular power supply, higher mobility of skilled labour and inputs within the firms, demand generation and a better transportation and communication facilities, etc.
- (ii) To provide the fund for investment at some concessional rate with subsidy the financial institutions (like Arunachal Pradesh industrial Development and Financial Corporation Ltd. APIDFC) have been established. Central Government has initiated many schemes of subsidy e.g. Central Investment Subsidy Scheme (CISS), Central Transport Subsidy Scheme (CTSS) etc. To accelerate the industrial growth and other incentives for example price preference, a subsidy on the training of manpower, industrial housing, exemption from sale's tax and registration fees etc. are provided to boost up the entrepreneurship within the State.
- (iii) To provide a link between the resource potential of the district and entrepreneurial capability of the people and the specialized developmental institutions, the District Industries Centre (CDIC) have been set up. This provides the organizational platform for the execution of various policies.

As a result of these steps, the small-scale industries have flourished in the State. Its number has increased from 11 in 1971 to 4596 in 1999. Further 18 medium scale industries have come up.

### **Some Basic Issues**

One basic problem of industries in Arunachal Pradesh is presumed that it suffers

from inadequate demand, which is because of the small size of population. Hence demand is not sufficient to stimulate the production. Further the urban agglomeration of territory is flooded with the goods supplied from plain areas.

Basically this is a false presumption that demographic factor determines the demand and so the rate and level of industrialization. Had this been the case, the industrialization would have been limited to the developing nations where around 80% of the world population resides. This is the size of market, which is important, and size of market depends upon:

1. Distribution of income: the higher the distribution is egalitarian the wider will be the middle classes who are the effective consumer because they have both aspiration and affordable capacity.
2. The specialization of industrial structure, i.e., the more the firms are specialized, the more the market expands and the higher will be the inter-linkages.
3. The level of wage rate; the higher will be the wage structure the more demand will come forth and market expands.
4. Market of commodity is prone to change. Hence it cannot be stagnant.
5. Market of industry depends on the decay of handicrafts and artisan production. Proto-industrialization is necessary.
6. Fiscal effect is also significant, i.e., market is created through Government expenditure.

Another set of problems in regard to industrialization in Arunachal Pradesh are often recorded as:

- There are two types of entrepreneurs in most of business activities. One is the real entrepreneur who is mostly non-local and second is the trading permit holder. There is an attitudinal difference between these two types of entrepreneurs, which hampers the growth of firm.
- The entrepreneurs are interested in availing the subsidies and concessional loans. And the funds are misallocated because they are used for some other purposes (not in the industrial proposal, which are registered).
- The government agency stresses more upon the relevant paper documents rather than the viability and feasibility of the proposed firms. And they are in the pressure of fulfilling the target. In order to fulfill the target and viability of their projects.

Let us reduce these events to the psychological plane of an individual. The whole behaviour of an individual can be classified under two categories.

1. Behaviour intending for the self-being, i.e., a teleological approach.
2. Behaviour intending for his/her agency, i.e., a deontological approach.

If the teleological approach prevails upon the deontological approach in the behaviour, this leads to the possessive individualism. And when the deontological approach prevails in the behaviour, this gives rise to the developmental individualism i.e., when whole develops automatically parts receive benefits.

Since there is a demand constraint and there is blockade in the factor flow across the sectors, the general business psychology (i.e., expectation) is that sufficient proceeds will not come forth. One expected profit happen to be less than the benefits firms receive in the form of various subsidies and other incentives. The firms would like to bank upon the benefits of these facilities than to go for production. Hence its logical corollary follows; the

higher the amount of incentives will be the more frequently such events will occur. This action of the entrepreneur makes the instrumental organ (government agency) to make ready at least the documents for record sake. This calculation of entrepreneur is more tilted towards the teleological approach and in this framework he is swayed away with acquisitive motive. Thus, unless the motive is checked on psychological plane such events cannot be stopped. And no amount of incentives would bring industrialization in the State.

The next basic issue I raise here that how far industrialization becomes an agent for the development of the society as a whole. Most of the backward regions face the problems of dual economy where we have two sectors; modern industrial sector and traditional agricultural sector. It is presumed that the benefit of industrialization must revolutionize the traditional agricultural sector, i.e., industrialization must be an agent for the development of society as a whole but instead it gives rise to inequality between the two sectors.

The benefit can be transferred if there are some linkages. The two sectors can be linked through two flows; the factor flow and the product flow.

Among factors, land is perfectly immobile. It carries significantly high importance in agriculture but it is of negligible significance in industrial sector. Capital and entrepreneurship have a unilinear trend of mobility because their movement is mainly governed by the return consideration. Labour is the only mobile factor across the two sectors. Further there exists organizational asymmetry between the two sectors, for instance, productivity is the basis of distribution in modern industrial sector then the conventional norm is the basis of distribution in the traditional agricultural sector. If surplus of labour in agriculture means that marginal productivity of labour is close to zero then competitive allocation is not possible because in agriculture if wage is so determined then hardly marginal peasants and agricultural labourer would survive. And if the prevailing wage rate of modern industrial sector is taken as a rate to clear all wage bills in agriculture then system will collapse for the proceed will hardly cover the cost due to price structure of agricultural products. Labour is the only equilibrating flow but still the two sectors cannot be brought in equivalence for products of labour are not equal across the sectors because of institutional asymmetry. In factor flow such asymmetry and rigidity hamper significantly the flow of benefits of industrialization to the agricultural sector. In product flow, products of both sectors flow smoothly across the sectors. But the terms of trade goes against agricultural sector. Hence industrialization has not served so significantly to the society as a whole as it is expected.

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