

Structural Change in the Economy of Arunachal Pradesh

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Abstract

This paper analyses sectoral composition of GSDP of Arunachal Pradesh. It finds that agriculture still has dominant share in the state's GSDP, though the structure of state's economy has become broad based in the recent years. According to the latest 2011-12 series, construction sector appears to be losing its significance only to be replaced by mining and manufacturing. Public administration continues to remain a key sector as well. The economy witnessed accelerated growth in the recent period, but it failed to generate employment and thus the state's performance in the recent decade can be characterised as jobless growth. At the same time, labour productivity accelerated concurrently with higher order of growth; and therefore the state's growth appears to be propelled by the rising labour productivity. Any discussion on structural transformation needs to therefore devise policy intervention for stimulating employment and reinforcing skill development programmes.

Introduction:

The aim of this paper is to explore the trends in the growth of gross state domestic product (GSDP) of Arunachal Pradesh, both at the aggregate level and at sectoral level, and sectoral composition of GSDP. As the state continues to have a great deal of dependence on labour intensive activities, we further examine trends in employment growth by major sectors. This paper ends with a few observations on labour productivity, which ought to become the focal point for the ongoing discourse on the policy interventions aimed at bringing about structural transformation of the state.

This paper is organised in two sections. In Section 1, we have analysed the growth and size of GSDP of the state, and employment related issues have been examined in Section 2.

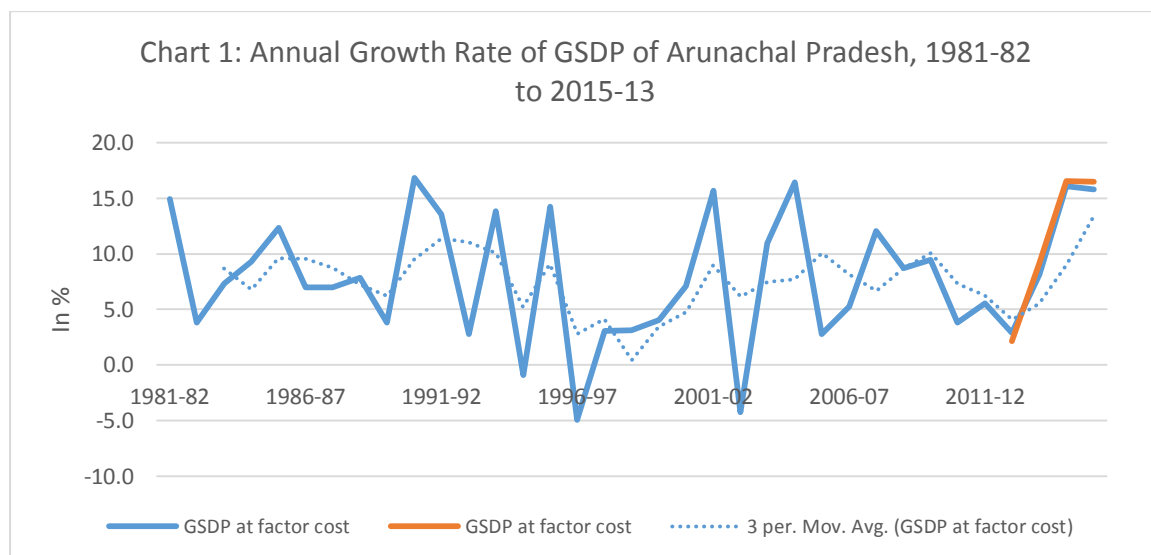
Section 1: Growth and Size of GSDP of Arunachal Pradesh

GSDP shows accelerated growth in recent years:

By any reckoning, the growth performance of Arunachal Pradesh has been remarkable in the recent years (Table 1). The GSDP of the state grew at a steady pace and also got accelerated, registering an

annual growth rate of 16.5 percent successively in 2014-15 and 2015-16. If we consider the period since 2004-05, which is generally considered period of high growth for the economy as a whole, barring 2007-08, the state's GSDP growth remained lower than that of economy-wide GDP throughout until 2012-13. Thereafter, the state's GSDP growth rate remained higher than the country's overall GDP growth rate. In comparison with the growth of GSDP of seven North Eastern States (NES)¹, the state of Arunachal Pradesh has performed better in the recent years. The acceleration in the growth of per capita income of the state is also discernible during the last three years from 2013-14, in comparison with both all of the seven NES and all India.

In the past also, the state has done well recording higher order of growth in few years (Graph 1). There has been, however, a wide fluctuations noticed in the annual growth rate year on year basis. In contrast, the state's GSDP show higher level of growth consistently three years in a row during 2013-14 to 2015-16.



Increasing Size of the State's GSDP:

We have examined the size of GSDP of Arunachal Pradesh by expressing it as percentage of total GSDP of all of the seven NES and GDP of the country. Further, we have also worked out the per capita income of the state as percentage of per capita income of all of the seven NES and of the country (Table 2). As per 2004-05 series, the state's GSDP accounted for about four percent of GSDP of the NES and fraction of GDP (about 0.10%). The relative share of state's GSDP in the total of NES

¹ Comprising of Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland and Tripura. For the description of the geography of the region, see Sharma and Shukla (1992).

showed a marginal rise from 4.1% in 2004-05 to 4.3% in 2008-09 and it subsequently went down to 3.9% in 2012-13. A similar trend is noticed in the relative share of the state's GSDP in the country's GDP. As per new 2011-12 series, we notice that the state's GSDP accounted for 4.9% in the total of NES in 2011-12 (compared to 4.2% in 2004-05 series) and 5.0% in 2013-14 (3.9% as per 2004-05 series). Thus, the relative share of the state's GSDP in the total GSDP of NES show a sharp rise as per the new 2011-12 series compared to the previous 2004-05 series. Though methodological changes² would have contributed to this, the state's GSDP increasingly account for a higher share in the income of NES. In 2011-12 series, the size of state's GSDP show a steady rise accounting for 4.9% of GSDP of all NES in 2011-12 and this gradually increased to 6.4% in 2015-16. A similar trend of rising size of the state's GSDP has been noticed even when we relate it to the country's GDP, which showed an upward trend from 0.13% of GDP in 2011-12 to 0.15% in 2015-16.

The per capita GSDP of the state remained higher than that of NES throughout, though the magnitude of the differences varied over the years. The state's per capita GSDP used to be higher than per capita GSDP of NES by nearly 35% between 2004-05 and 2011-12. As per 2011-12 series, per capita GSDP of the state remained 59.4% higher than that of NES in 2011-12 and further 87.7% more in 2015-16. Interestingly, the state's per capita GSDP remained lower than that of country's per capita GDP; the state's per capita income used to be 99.8% of the country's per capita income in 2005-06, and this gradually declined to 86.3% in 2013-14, according to 2004-05 series. At the same time, the state's per capita income remained higher than the country's per capita income between 2011-12 and 2015-16, according to 2011-12 series.

The relative share of the state's GSDP in total population of NES and of the country was in the order of 3.1% and 0.11%, respectively, between 2004-05 and 2013-14. A comparison shows that the state's population share is disproportionately higher compared its share in GSDP of NES, whereas fractionally lower compared to its share in country's GDP. In the 2011-12 series, the state had disproportionately a large share in GSDP of NES compared to its share in population, and also its share in country's GDP remained higher than its corresponding population share.

In brief, the state's performance has been remarkable in recent years, not only growth rate of its GSDP and per capita GSDP remained higher but the pace seemed to have accelerated. Moreover, state's share in GSDP remained disproportionately higher than its share in the population of NES, whereas its share in the country's GDP remained higher than its share in country's population only in 2011-12 series.

The sharp rise in the relative size of GSDP between 2004-05 and 2011-12 series is also noticed in the overlapping years of 2011-12 to 2013-14. It may also provide a forewarning that some part of the

² For a brief review of changes introduced in National Accounts Statistics base year 2011-12 series, see Rajakumar and Shetty (2017).

observed growth could be statistical arising from changes in the methodology related to deriving state GSDP based on allocation method³, and also new sources of data that may be used to supplement earlier estimates.

Changing structural composition of GSDP:

In this sub-section, we have examined sectoral composition of the state's GSDP and compared the same with that of NES, at disaggregate level (division) and at major sector. There are 11 major division as given in Table 3. They can be appropriately grouped into three major sectors such as agriculture, industry and services.

To begin with, we have worked out the sectoral composition of GSDP by major divisions and by major sectors (Table 3). There is no particular periodisation per se followed. Rather we have broadly considered the first year and ending year for which the state's GSDP data are available in a given price series. Since base year 1980-81 had a long intervening period before the subsequent revision that took place in 1993-94, we have consciously provided sectoral shares in GSDP for 1989-90 since when a reversal of trend had been noticed.

At the disaggregate level, sectoral composition points out to the fact that the state of Arunachal Pradesh continues to be dependent upon agriculture as this sector alone contributes a major portion of the state's GSDP. The magnitude of agriculture sectoral share in GSDP varied over the years; it used to account for nearly 44.5% of GSDP in 1980-81, which declined by 4.3 percentage points to 40.2% in 1993-94. Between 1993-94 and 1999-2000, the sectoral share went down by 7.3 percentage points, as per 1993-94 series. Further, the sector's contribution to GSDP went down by 8.1 percentage points between 1999-2000 and 2004-05 in the subsequent series. The declining share of agriculture has been noticeably arrested during the period 2004-05 and 2011-12, which witnessed the sector's share going up by nearly 9.1 percentage points from 35.1% to 44.2% of GSDP, according to 2004-05 series. However, as per the latest 2011-12 series, the share of agriculture dwindled by 3.8 percentage points from 42.0% in 2011-12 to 38.2% in 2015-16. Thus, there is discernible fall in the share of agriculture between 1980-81 and 2004-05, since when there has been some increase in the sector's contribution to GSDP.

The construction sector used to be the second largest sector for Arunachal Pradesh for a very long time till about 2011-12. The sector contributed little less than one-fifth of GSDP in the 1980s. In the 1990s, its contribution to GSDP declined by 7.2 percentage points between 1993-94 and 1999-2000. However, there is a huge revival in the relative share of construction in GSDP during the first half of

³ For a review of changes introduced in 2011-12 series in deriving estimates at the state level, see Dholakia and Pandya (2017).

2000, which went up from 14.0% in 1999-2000 to 23.6% in 2004-05. But thereafter, the sector's share showed a sharp decline. As per 2004-05 series, the construction sector constituted second largest sector in the state accounting for 16.4% of GSDP in 2011-12, next to agriculture. However, as per 2011-12 series, the sector share stood at 6.4% of GSDP in that year.

Public administration appears to be the third largest sector and this is particularly so in all base year series. This used to account for nearly 10% of the GSDP till the mid-1990s since when it showed a rise to about 15% by 2004-05. Thereafter, its share has marginally come down to about 12% in the following decade.

The category 'Other Services' remains the next important segment which doubled its share in GSDP between 1980-81 and 1993-94 from 7.3% to 14.0%. However, as per 1993-94 series, this segment accounted for only 8.2% of GSDP in 1993-94. Though there are fluctuations in the relative share of 'Other Services', it contributes about one tenth of the state GSDP.

Individually, all other sectors contribute about five percent each to the GSDP though they varied over the years, and across different base years. Contribution of mining and quarrying is very fractional, less than three per cent throughout except in 2015-16 (more on it later). In fact, share of manufacturing shows a sharp decline from about 6.0% in the early 1980s to about one per cent in 2011-12. But there is a reversal in the sector's share in GSDP (more later). The share of 'Electricity, gas and water supply' appeared to be very meagre till 2004-05, since when the rise in sector's share in GSDP is very prominent. There is an increased share of 'Transport, storage and communication' between mid-1990s and mid-2000s. The sector's share gradually has come down since then. The contribution of banking and insurance remained little less than two per cent throughout. The contribution of 'Real estate, ownership of dwellings and business services' also showed a sharp decline over the years, though it remained at about two percent since the mid-1990s.

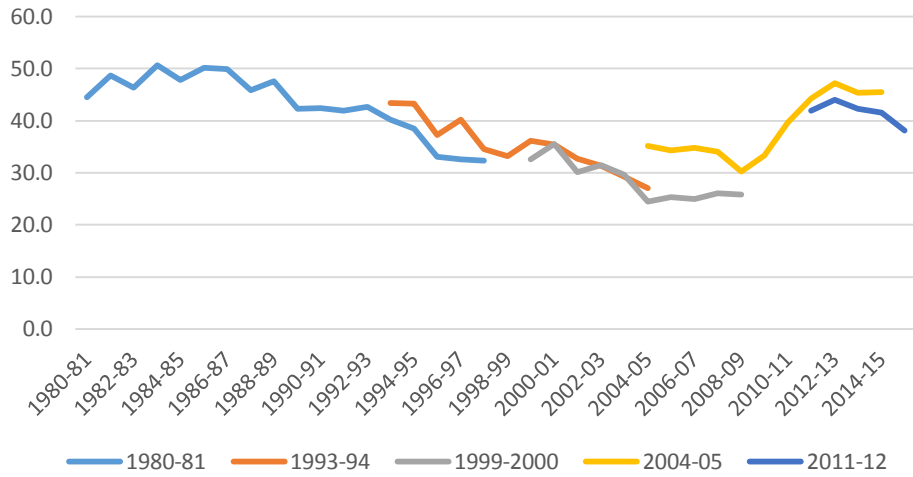
The decline in the share of agriculture in the 1980s was mostly replaced by increased share of 'other services'. In the 1990s, decline in the share of two major sectors such as agriculture and construction was mostly compensated by the increased share of electricity and public administration. However, the sharp decline in the share of agriculture during 1999-2000 and 2004-05 was largely compensated by the increased contribution from construction. The rising share of agriculture between 2004-05 and 2011-12 had compensated declining share of construction and electricity. According to the latest 2011-12 series, the importance of construction has come down drastically to be replaced by electricity generation.

The above discussion inevitably suggests sectoral change taking place in the state of Arunachal Pradesh. The erstwhile important sectors such as agriculture and construction are increasingly replaced by electricity generation, manufacturing and mining & quarrying. More so, the structure of

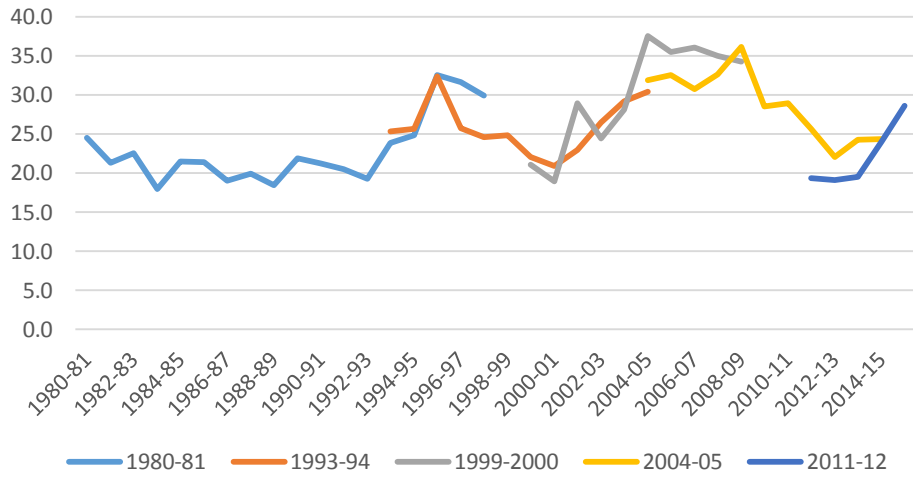
the economy of Arunachal Pradesh has become broad based, though agriculture continues to be the dominant sector. Similarly, the relative significance of public administration continues to persist.

We have mapped the sectoral composition by major sectors for various years in different base years (Graph 2a, 2b and 2c). It is clear that the share of agriculture has declined till about 2004-05, since when there is some increase (Graph 2a). The share of industry remained nearly the same in the 1980s, but marginally declined in the 1990s; but showed a sharp rise since then largely due to construction till 2004-05 and manufacturing and mining during the last few years (Graph 2b). The share of service sector in the state's GSDP, dominated by both public administration and other services, went up between 1993-94 and 2004-05 since when it showed a fall (Graph 2c).

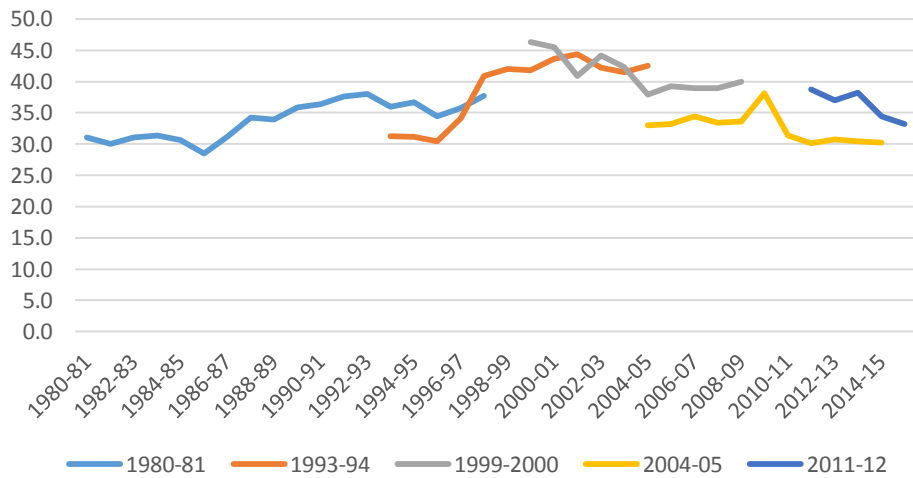
Graph 2A. Percentage share of Agriculture in GSDP



Graph 2B. Percentage share of Industry in GSDP



Graph 2C: Percentage share of Service Sector in GSDP



The sectoral composition of GSDP of NES show that the relative share of agriculture has nearly been reduced by nearly a half from 44% in the early 1980s to 22% in the latest years (Table 4). At the same time, the industry share doubled from about 14% in the early 1980s to 29% in the recent years, though the construction sector's share in the GSDP of the region has dramatically stood reduced at 2% in the 2011-12 series, compared to a little over 10% in the previous 2004-05 series. The share of services sector in GSDP, mostly consisting of trade and public administration till 2011-12 and transport and public administration thereafter, also showed a rise from about 40% to 49% between the early 1980s and recent years.

Thus, unlike the NES region as a whole, Arunachal Pradesh has higher dependence on agriculture, construction and public administration. The state's reliance on few activities such as manufacturing, transport and real estate is relatively low compared to the entire NES. This partly explains the relatively stagnant share of service sector and a moderate rise in the share of industry in the state's GSDP, whereas share of both these sectors went up rather sharply for NES and this helped to replace the sectoral share of agriculture to a significant extent.

Earlier, it was observed that the GSDP of Arunachal Pradesh in total GSDP of NES showed a rise over the years. In Table 5, we have compared the growth rate of major sectors of the state with that of NES. For the purpose of analysis, we had to first prepare a time series of GSDP at constant prices using 2011-12 series as the reference point and growth rate as per previous series. A similar exercise was carried out by EPW Research Foundation (2009). These data were used for analysis of employment elasticity and labour productivity, as presented in the subsequent section.

Table 5: Period Average Annual Growth rate of GSDP and Major Sectors of Arunachal Pradesh (at constant 2011-12 price, in %)

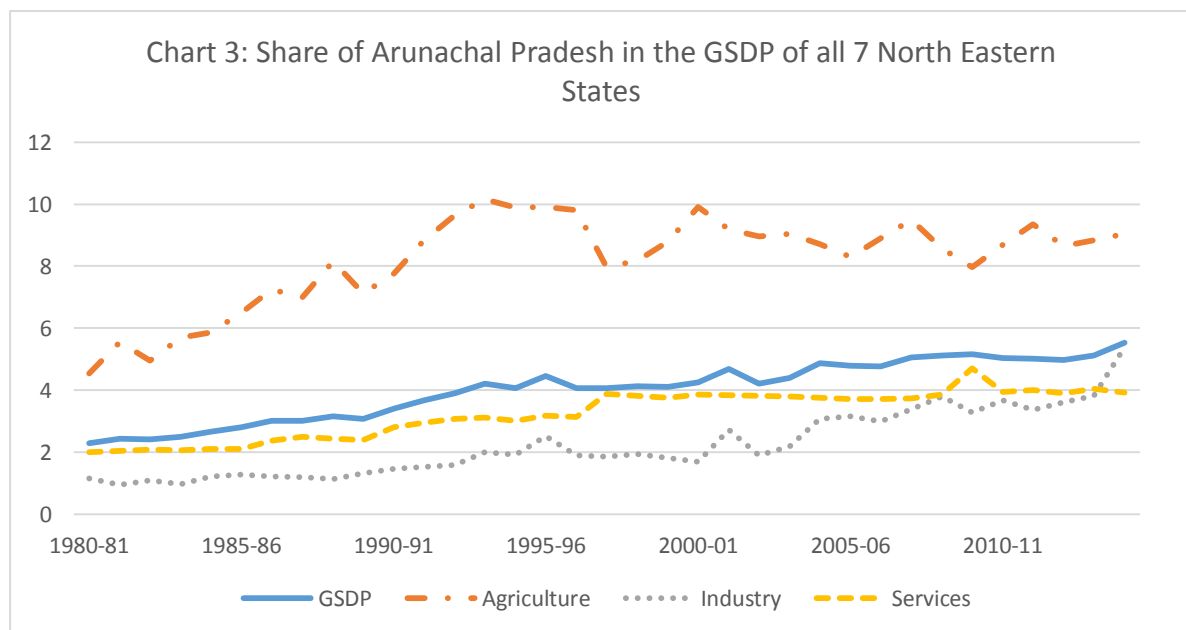
Period	Arunachal Pradesh				All of 7 North Eastern States			
	GSDP	Agriculture	Industry	Services	GSDP	Agriculture	Industry	Services
1981-82 to 1992-93	8.9	9.3	8.4	9.6	4.2	2.3	5.2	5.6
1993-94 to 2003-04	5.6	1.4	12.7	7.4	4.2	1.7	6.3	5.2
2004-05 to 2010-11	8.4	3.2	14.1	9.6	6.2	3.5	4.7	8.4
2011-12 to 2014-15	8.2	7.1	16.1	6.2	5.6	6.1	4.0	6.3

Source: Author's calculation based on data extracted from EPWRF India Time Series (www.epwrfits.in)

Having worked out the annual rate of change, we had then worked out average growth rate for four periods as presented in Table 5. It shows that not only the state's average annual growth of GSDP was higher than that of NES in all periods, but the sectoral GSDP also grew faster compared to the entire NES region. In fact, the period average of state's GSDP growth rate remained higher than 8% except during 1993-94 and 2003-04; whereas it remained less than 6.2% in the case of NES as a whole.

Similarly, the state of Arunachal Pradesh recorded remarkable industry and service sectoral growth, compared to NES region.

Resulting from these higher growth, the share of state's GSDP in that of NES region showed a continuous rise (Graph 3). This is the case with industry and service sector. However, the state's share in the agriculture GSDP of all of NES remained stagnant at about 8% to 9% since the mid-1990s. This shows that the rise in the state's share in the GSDP of NES as a whole is mostly explained by the rising share of services, and more recently by the sharp rise in the share of industry.



It was earlier noticed that the share of manufacturing and mining and quarrying increased their contribution. We have made a careful perusal of their actual values (Table 6). The rise in the GSDP originating from both these sectors is rather sharp; the gross value added (GVA) at basic price of mining sector stood at Rs. 23022 lakh in 2011-12 and it grew by 41.7% to Rs. 32615 lakh in 2012-13. More importantly, it went up by a whopping 643% to Rs. 260197 lakh in 2015-16 from Rs. 35021 lakh reported in the previous year. Similarly, the GVA of manufacturing showed a huge jump by 30.3% in 2013-14 from Rs. 14037 lakh to Rs. 18285 lakh and notably by 255% to Rs. 64950 lakh. The level of manufacturing GVA remained nearly the same in 2015-16.

Table 6: Gross State Value Added of Mining and quarrying and manufacturing activity in Arunachal Pradesh (at constant (2011-12) prices)

Years	Mining and quarrying		Manufacturing	
	Rs. in Lakh	Growth rate (in %)	Rs. in Lakh	Growth rate (in %)
2011-12	23022		12900	
2012-13	32615	41.7	14037	8.8
2013-14	37071	13.7	18285	30.3
2014-15	35021	-5.5	64950	255.2
2015-16	260197	643.0	73790	13.6

Source: Data extracted from EPWRF India Time Series (www.epwrfits.in)

It is worthwhile mentioning here that the manufacturing of Arunachal Pradesh has basically represented unregistered segment; largely because the state was not covered by the Annual Survey of Industries (ASI) which is the principal source for deriving GVA of the registered manufacturing. However, the ASI covered Arunachal Pradesh in 2014-15 and we have culled out certain important principal characteristics for the state (Table 7). According to ASI 2014-15, Arunachal Pradesh had 122 factories, which employed 3684 persons and registered gross value of output to the tune of Rs. 134874 lakh. These factories together accounted for gross value added of Rs. 36175 lakh. These ASI factories are essentially registered factories and, as noted above, ASI covered the state for the first time in 2014-15. If they were considered newly as part of manufacturing GVA of the state, reflecting the GVA of registered segment, then the size of state's manufacturing GVA would have gone up by the same amount, that is, roughly about 56% of manufacturing GVA in 2014-15 has come from the inclusion of units covered by the ASI. If we are right, then the sharp rise in the manufacturing GVA of the state for the same year could be attributed to statistical improvement.

Table 7: Selected Characteristics of factory sector for Arunachal Pradesh for the year 2014-15.

Selected Characteristics	Units	ASI Manufacturing
Number of Factories	(in numbers)	122
Fixed Capital	(Rs Lakh)	19176
Value of Gross Output	(Rs Lakh)	134874
Gross Value Added	(Rs Lakh)	36175
Total Persons Engaged	(in numbers)	3684
Number of Workers	(in numbers)	2925
Number of Employees	(in numbers)	3627

Source: EPWRF India Time Series (www.epwrfits.in)

Section II:

Is Growth Supporting Employment?

We had seen that state of Arunachal Pradesh has relatively a high degree of reliance on sectors, such as agriculture, construction and so on, which are labour intensive. A related question here is if the growth of the economy is supporting employment. This section examines certain crucial aspects of employment.

A brief mention about how we obtained employment data is in order. As is well known, the National Sample Survey Office (NSSO, formerly Organisation) collects employment related data through its subject programme on Employment and Unemployment Surveys (EUS). They have different reference years, mostly overlapping with base years of national accounts statistics. While publishing the survey results, NSSO provides Labour Force Participation Rate (LFPR), which is expressed as number of persons employed to total persons. Along with this, they provide estimated number of persons as well. Using the LFPR and the information on estimated number of persons, it is possible to derive total persons employed.

Further, the NSSO provides distribution of employment by sectors which is similar to division categories of national accounts. By appropriately grouping them, it is possible to arrive as percentage of persons employed by major sectors. Then applying this proportion on the estimated number of persons employed, it is possible to obtain the number of persons employed by major sectors.

Though the NSSO has been carrying out the EUS for a while, it has included Arunachal Pradesh since its survey for 1999-2000 and so this section considers period thereafter. Following aforesaid procedure, we have obtained employment related information for all the 7 NES for comparison.

More than two third of employment is in agriculture:

Employment in agriculture is the key for Arunachal Pradesh (Table 8). Though the sector used to account for nearly three-fourth of total employment, it accounts for little over two-third in 2011-12. The employment in industrial sector has generally fallen in 2011-12 to 7% from 8.1% in 1999-2000. In sharp contrast, services sector has become an important employment generating sector; not only it accounts for nearly one fourth of total employment in 2011-12, but its share show a continuous increase from 16.3% in 1999-2000. At the same time, employment in agriculture sector seems to be disproportionately larger compared to the sector's share in the state GSDP. Although employment in industrial sector shows a decline over the years compared to 1999-2000, its share in GSDP has improved by a significant margin. And also, service sector showed a continuous rise in the share of employment, whereas the sector's share did not show any perceptible rise between 1999-2000 and 2011-12.

For the NES as a whole, employment in agriculture has come down along with decline in the sector's share in GSDP. Industry's share in employment showed a huge rise by nearly 10 percentage points between 1999-2000 and 2011-12, but the sector's share in GSDP showed a rise by about 2.7 percentage points during the same period. However, the service sector's share in employment showed a decline by 2.6 percentage points and the sector's share in GSDP went up by 7.1 percentage points.

In comparison with NES, the trends in sectoral employment share show somewhat different picture. Notably, the marginal reduction in the industrial sector's share in employment accompanied by sharp rise in the sector's share contrasts the trends for NES as a whole which witnessed a larger rise in the share in employment but very little rise in the sector's share in GSDP. And opposite tendencies are noticed in the case of employment in service sectors.

Table 8: Sectoral Shares in Employment and GSDP (in %)

Reference Year	Arunachal Pradesh				All of 7 North Eastern States			
	Total	Agriculture	Industry	Services	Total	Agriculture	Industry	Services
Employment								
1999-2000	100	75.5	8.1	16.3	100	59.4	7.5	33.1
2004-05	100	75.6	5.9	18.4	100	65.6	8.3	26.1
2009-10	100	65.5	9.5	25.1	100	59.3	12.8	27.9
2011-12	100	67.8	7.0	25.2	100	52.3	17.3	30.5
GSDP								
1999-2000	100	68.5	11.6	37.9	100	32.0	26.2	41.5
2004-05	100	48.0	20.6	32.4	100	26.8	32.6	42.1
2009-10	100	36.8	19.3	42.4	100	23.8	30.3	46.4
2011-12	100	42.0	19.3	38.7	100	22.5	28.9	48.6

Source: Author's calculation based on data extracted from National Sample Survey Organisation (NSSO), *Employment and Unemployment Survey*, Various reports; and *EPWRF India Time Series* (www.epwrfits.in)

Jobless growth features Arunachal Pradesh:

An important observation made by several scholars with regard to the feature of country's growth is that higher order of economy-wide growth was not accompanied by growth in employment, a phenomenon often characterised as jobless growth. A similar phenomenon is discernible even in the case of Arunachal Pradesh (Table 9). Since we have data only for reference years of EUS, we have worked out compounded annual growth rate (CAGR) for employment and their corresponding GSDP.

While Arunachal Pradesh recorded an impressive annual growth of 8.9% between 1999-2000 and 2004-05, it also recorded remarkable employment growth at the rate of 11.3% per annum during the same period. Since then, its GSDP grew at a rate higher than the rate at which employment grew. More so, annual growth in employment in agriculture sector remained negative at (-)1.0% between

2004-05 and 2011-12, the sector's GSDP grew at an accelerated rate of 4.7%. Similarly, growth in employment remained subdued compared to the sector's GSDP growth. In the case of service sector, the sectoral employment was very impressive at 14.1% annually between 1999-2000 and 2004-05, compared to its GSDP growth at the rate of 5.6%. Though the sector's employment grew at 5.2% thereafter till 2011-12, it was lower compared the sector's GSDP growth rate of 9.5%.

Whether the growth supported employment generation could be examined by working out employment elasticities, which is the ratio of CAGR of labour force to CAGR of GSDP. As it may be expected based on above analysis, employment elasticity of the state is rather poorer particularly in agriculture and services sectors since 2004-05, but somewhat better than those observed in the case of NES. The industrial sector has better employment elasticities both between and 2004-05 and 2009-10. This shows that growth is taking place in Arunachal Pradesh, but it is not supporting employment generation.

Table 9: Growth in Employment and GSDP (in %)

Reference Period	Arunachal Pradesh				All of 7 North Eastern States			
	Total	Agriculture	Industry	Services	Total	Agriculture	Industry	Services
CAGR of Employment								
2004-05 over 1999-00	11.3	11.3	4.4	14.1	5.4	7.5	7.3	0.5
2009-10 over 2004-05	2.0	-0.8	12.3	8.5	0.8	-1.2	10.0	2.1
2011-12 over 2004-05	0.5	-1.0	3.0	5.2	0.3	-2.9	11.4	2.5
CAGR of GSDP								
2004-05 over 1999-00	8.9	1.4	22.2	5.6	5.3	1.6	10.0	5.6
2009-10 over 2004-05	7.6	2.0	6.3	13.5	6.4	3.9	4.8	8.5
2011-12 over 2004-05	6.8	4.7	5.8	9.5	6.3	3.7	4.4	8.5
Employment Elasticity								
2004-05 over 1999-00	1.3	7.8	0.2	2.5	1.0	4.6	0.7	0.1
2009-10 over 2004-05	0.3	-0.4	2.0	0.6	0.1	-0.3	2.1	0.3
2011-12 over 2004-05	0.1	-0.2	0.5	0.5	0.0	-0.8	2.6	0.3

Note: CAGR refers to compounded annual growth rate

Employment elasticity is the ratio of CAGR of employment to CAGR of GSDP

Source: Author's calculation based on data extracted from National Sample Survey Organisation (NSSO), *Employment and Unemployment Survey*, Various reports; and *EPWRF India Time Series* (www.epwrfits.in)

Improved productivity:

A noteworthy feature of growth of Arunachal Pradesh is the rising labour productivity (Table 10). We have worked out productivity of labour force by working out GSDP per person employed. Productivity of labour force showed a sharp decline, at about (-) 2.2% annually for the state as a whole between 1999-2000 and 2004-05. While this being the case of both agriculture and service

sectors, the CAGR of productivity in industrial sector remained higher at 17%. The trend however got reversed between 2004-05 and 2011-12. A similar trend is noticed in the case of NES region as a whole, although CAGR of labour productivity in the entire region between 2004-05 and 2011-12 appears to be better than the state, except in the case of industry. This shows that growth of Arunachal Pradesh is by and large is supported by increased labour productivity in all major sectors particularly since 2004-05.

Table 10: Productivity of Labour Force

Reference Year/Period	Arunachal Pradesh				All of 7 North Eastern States			
	Total	Agriculture	Industry	Services	Total	Agriculture	Industry	Services
GSDP per person employed (Amount in Rs, at 2011-12 price)								
1999-2000	205233	186122	292555	478425	101750	54853	353034	127474
2004-05	184035	116976	642692	323939	101289	41426	399381	163246
2009-10	240062	134619	488565	405925	132565	53183	314356	220655
2011-12	280047	173312	777337	429909	152223	65627	254962	242704
Compounded Annual Growth Rate								
2004-05 over 1999-00	-2.2	-8.9	17.0	-7.5	-0.1	-5.5	2.5	5.1
2009-10 over 2004-05	5.5	2.8	-5.3	4.6	5.5	5.1	-4.7	6.2
2011-12 over 2004-05	6.2	5.8	2.8	4.1	6.0	6.8	-6.2	5.8

Source: Author's calculation based on data extracted from National Sample Survey Organisation (NSSO), *Employment and Unemployment Survey*, Various reports; and *EPWRF India Time Series* (www.epwrfits.in)

Concluding Remarks:

This paper made an attempt to examine the structural changes taking place in the economy of Arunachal Pradesh. Although the state still experiences dominance of agriculture, the structure of state's economy has increasingly become broad based in the recent years, which also witnessed acceleration in the growth rate of the state's GSDP. As per the latest 2011-12 series, importance of construction sector has dwindled and it is getting fast replaced by sectors such as mining and manufacturing. Public administration also remains a key source of state's GSDP. However, the recorded growth between 2004-05 and 2011-12 did not adequately generate employment and thus the state's performance is also featured by the phenomenon of jobless growth in the recent decade. At the same time, labour productivity has accelerated concurrently with higher order of growth; and therefore the state's growth appears to be propelled by the rising labour productivity. Any discussion on structural transformation needs to therefore devise policy intervention for stimulating employment and reinforcing skill development programmes.

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Table 1: Growth of GDP of Arunachal Pradesh (at constant price)

Years	Domestic Product (Rs. in Crore)			Per capita GDP			Growth rate - GDP			Growth rate - Per capita GDP		
	Arunachal Pradesh	All of 7 North Eastern States	All India	Arunachal Pradesh	All of 7 North Eastern States	All India	Arunachal Pradesh	All of 7 North Eastern States	All India	Arunachal Pradesh	All of 7 North Eastern States	All India
2004-05 series												
2004-05	34875	86002	2971464	29232	21275	27286						
2005-06	35842	90062	3253073	29356	21935	29413	2.8	4.7	9.5	0.4	3.1	7.8
2006-07	37721	94895	3564364	30189	22759	31768	5.2	5.4	9.6	2.8	3.8	8.0
2007-08	42268	100434	3896636	33054	23725	34241	12.1	5.8	9.3	9.5	4.2	7.8
2008-09	45958	107639	4158676	35118	25052	36037	8.7	7.2	6.7	6.2	5.6	5.2
2009-10	50295	117152	4516071	37553	26867	38599	9.4	8.8	8.6	6.9	7.2	7.1
2010-11	52204	124378	4918533	38087	28118	41472	3.8	6.2	8.9	1.4	4.7	7.4
2011-12	55103	131700	5247530	39283	29329	43657	5.6	5.9	6.7	3.1	4.3	5.3
2012-13	54224	139247	5482111	37772	30555	45046	-1.6	5.7	4.5	-3.8	4.2	3.2
2013-14	59048	150151	5741791	40192	32469	46568	8.9	7.8	4.7	6.4	6.3	3.4
2011-12 Series												
2011-12	11063	225714	8736329	79019	49565	71609						
2012-13	11299	233499	9213017	79126	50550	74599	2.1	3.4	5.5	0.1	2.0	4.2
2013-14	12338	247356	9801370	84683	52792	78348	9.2	5.9	6.4	7.0	4.4	5.0
2014-15	14376	265593	10536984	96678	55896	83165	16.5	7.4	7.5	14.2	5.9	6.1
2015-16	16744		11381002	110451	58849	88706	16.5		8.0	14.2	5.3	6.7

Note: GDP in 2004-05 series is at factor cost and in 2011-12 series is at market price

Data for Tripura is not available for 2015-16

Source: Author's calculation based on data extracted from EPWRF India Time Series (www.epwrfits.in)

Table 2: GSDP of Arunachal Pradesh as % of North Eastern States and All India (at constant price)

Years	GSDP of Arunachal Pradesh as % of		Per capita GSDP of Arunachal Pradesh as % of		Population of Arunachal Pradesh as % of	
	GSDP of All of 7 North Eastern States	All India - GDP	Per capita GSDP of All of 7 North Eastern States	All India – Per capita GDP	All of 7 North Eastern States	All India
2004-05 series						
2004-05	4.1	0.12	137.4	107.1	3.0	0.11
2005-06	4.0	0.11	133.8	99.8	3.0	0.11
2006-07	4.0	0.11	132.6	95.0	3.0	0.11
2007-08	4.2	0.11	139.3	96.5	3.0	0.11
2008-09	4.3	0.11	140.2	97.4	3.0	0.11
2009-10	4.3	0.11	139.8	97.3	3.1	0.11
2010-11	4.2	0.11	135.5	91.8	3.1	0.12
2011-12	4.2	0.11	133.9	90.0	3.1	0.12
2012-13	3.9	0.10	123.6	83.9	3.1	0.12
2013-14	3.9	0.10	123.8	86.3	3.2	0.12
2011-12 Series						
2011-12	4.9	0.13	159.4	110.3	3.1	0.11
2012-13	4.8	0.12	156.5	106.1	3.1	0.12
2013-14	5.0	0.13	160.4	108.1	3.1	0.12
2014-15	5.4	0.14	173.0	116.2	3.1	0.12
2015-16	6.4	0.15	187.7	124.5	3.4	0.12

Note: GDP in 2004-05 series is at factor cost and in 2011-12 series is at market price

Data for Tripura is not available for 2015-16

Source: Author's calculation based on data extracted from EPWRF India Time Series (www.epwrfits.in)

Table 3: Sector-wise Distribution of GSDP (at current price) of Arunachal Pradesh (in %)

Industry	Agriculture, etc	Mining and Quarrying	Manufacturing	Construction	Electricity, etc	Transport, etc	Trade, etc	Banking and Insurance	Real Estate, etc	Public Administration	Other Services	Total		Agriculture	Industry	Services
1980-81 Series																
1980-81	44.5	0.1	6.3	18.1	0.1	0.6	4.3	0.6	7.6	10.7	7.3	100.0		44.5	24.5	31.0
1989-90	42.2	1.1	5.6	15.6	-0.4	1.0	6.0	1.3	7.0	10.5	10.1	100.0		42.2	21.9	35.9
1993-94	40.2	1.0	4.2	19.0	-0.4	1.2	6.0	1.1	3.5	10.1	14.0	100.0		40.2	23.8	36.0
1993-94 Series																
1993-94	43.4	1.7	3.8	19.2	0.7	3.6	6.1	1.1	2.1	10.0	8.2	100.0		43.4	25.3	31.2
1999-00	36.1	1.2	3.5	12.0	5.4	6.1	4.2	1.8	2.4	16.5	10.9	100.0		36.1	22.1	41.8
1999-2000 Series																
1999-00	32.6	2.5	2.9	14.0	1.7	5.4	5.9	2.4	3.2	15.9	13.5	100.0		32.6	21.1	46.3
2004-05	24.5	2.7	2.1	23.6	9.2	4.1	4.0	1.9	2.6	14.9	10.5	100.0		24.5	37.6	37.9
2004-05 Series																
2004-05	35.1	2.3	2.1	20.2	7.4	2.8	3.6	2.2	2.1	11.8	10.5	100.0		35.1	31.9	33.0
2011-12	44.2	2.9	1.8	16.4	4.5	2.2	3.8	2.2	1.6	11.3	9.0	100.0		44.2	25.6	30.2
2011-12 Series																
2011-12	42.0	2.1	1.2	6.4	9.6	2.2	5.5	1.9	3.5	12.5	13.1	100.0		42.0	19.3	38.7
2015-16	38.2	10.2	3.6	5.9	8.9	2.2	3.3	1.4	2.5	12.7	11.1	100.0		38.2	28.6	33.2

Notes: Agriculture, etc refers to Agriculture and Allied Activities

Electricity, etc refers to Electricity, Gas and Water supply

Transport etc refers to Transport, Storage and Communication

Trade, etc refers to Trade, Hotels and Restaurants

Real estate etc refers to Real Estate, Ownership of Dwellings and Business Services

I Agriculture covers Agriculture and Allied Activities

II Industry covers (2) Mining and Quarrying, (3) Manufacturing, (4) Construction, (5) Electricity, Gas and Water supply

III Services covers (6) Transport, Storage and Communication, (7) Trade, Hotels and Restaurants, (8) Banking and Insurance, (9) Real Estate, Ownership of Dwellings and Business Services, (10) Public Administration, (11) Other Services

Source: Author's calculation based on data extracted from EPWRF India Time Series (www.epwrfits.in)

Table 4: Sector-wise Distribution of GSDP (at current price) of North Eastern States (in %)

Industry	Agriculture, etc	Mining and Quarrying	Manufacturing	Construction	Electricity, etc	Transport, etc	Trade, etc	Banking and Insurance	Real Estate, etc	Public Administration	Other Services	Total		Agriculture	Industry	Services
1980-81 Series																
1980-81	44.7	1.6	6.5	5.8	0.8	3.2	9.9	1.2	11.1	6.0	9.2	100.0		44.7	14.8	40.6
1989-90	35.8	10.2	9.5	6.3	1.5	4.5	8.3	1.6	6.7	7.4	8.3	100.0		35.8	27.5	36.8
1993-94	38.2	6.9	6.8	6.5	1.6	4.7	9.0	2.4	5.6	8.6	9.7	100.0		38.2	21.7	40.1
1993-94 Series																
1993-94	36.8	5.5	7.1	5.9	2.0	4.8	14.5	2.4	4.5	8.6	7.7	100.0		36.8	20.6	42.6
1999-00	35.5	5.6	6.9	6.0	2.0	4.4	11.1	3.2	4.3	10.4	10.6	100.0		35.5	20.5	44.0
1999-2000 Series																
1999-00	32.5	4.5	6.0	6.2	1.7	6.4	11.0	2.8	4.6	9.6	14.7	100.0		32.5	18.4	49.1
2004-05	26.5	6.0	7.7	8.6	2.6	5.9	12.1	2.8	5.2	9.2	13.5	100.0		26.5	24.9	48.7
2004-05 Series																
2004-05	26.2	6.4	7.7	10.0	2.4	5.7	11.9	2.7	5.1	8.8	13.1	100.0		26.2	26.5	47.3
2011-12	24.1	4.9	6.5	12.0	1.5	6.2	11.9	3.2	4.8	9.4	15.4	100.0		24.1	24.9	51.0
2011-12 Series																
2011-12	22.5	8.1	10.0	2.2	8.6	13.6	5.4	3.0	7.8	8.9	9.8	100.0		22.5	28.9	48.6
2015-16	22.4	8.5	9.3	2.5	8.9	14.3	5.9	2.7	6.5	8.7	10.4	100.0		22.4	29.1	48.4

Notes: Agriculture, etc refers to Agriculture and Allied Activities

Electricity, etc refers to Electricity, Gas and Water supply

Transport etc refers to Transport, Storage and Communication

Trade, etc refers to Trade, Hotels and Restaurants

Real estate etc refers to Real Estate, Ownership of Dwellings and Business Services

I Agriculture covers Agriculture and Allied Activities

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III Services covers (6) Transport, Storage and Communication, (7) Trade, Hotels and Restaurants, (8) Banking and Insurance, (9) Real Estate, Ownership of Dwellings and Business Services, (10) Public Administration, (11) Other Services

Source: Author's calculation based on data extracted from EPWRF India Time Series (www.epwrfits.in)

