POPULATION GROWTH AND ITS IMPACT ON ECONOMIC DEVELOPMENT IN NAGALAND: AN EMPIRICAL ANALYSIS

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ABSTRACT

This study empirically tests the impact of population growth on economic development of Nagaland for the period of 1981-2011. Demographic transition helps in creating a policy environment that takes maximum advantage of the demographic potential of the State. The regression technique was incorporated to investigate the relationship between population growth and economic development. The findings indicate that the labour forces were shifting from the low-productivity agriculture sector to the higher-productivity industry and service sectors. The domino effect of the study indicates that population growth has positively and significantly contributed to economic development but is negatively affected by the unemployment rate. Now although on the one hand, if it increases growth but on the other hand, it creates a problem of unemployment and leads to a decline in net state domestic product and per-capita income. The government is advised to utilize this additional workforce efficiently as a policy tool to achieve a high and desired level of growth.

INTRODUCTION

Nagaland's shifting demographics are generating new economic opportunities. Economic growth would accelerate if the working population can be productively employed (Jamir, 2019b; Sharma, 2008). This study has attempted to understand and forecast economic growth in Nagaland, which focuses on theoretical and empirical literature on the impact of demographic changes and economic growth (Solow, 1956; Mankiw et al., 1992; Bloom et al., 2000; Reher, 2011; David, 2009; Jokhi and Pandya, 2016; George, 2008; Higgins and William, 1997). The economy of the State is highly dependent on agriculture and allied activities. More than half of the workforce is employed in the agriculture sector (Jamir, 2021b; Jamir, 2021d; Jamir, 2022a; Jamir, 2022b; Jamir, 2020b). This has ensured a low per capita income, which is below the national average (Jamir, 2020a; Jamir, 2019a). But in terms of some demographic characteristics, Nagaland is more like the developed countries of the west, while its economy resembles that of the developing countries of the east (Anulawathie Menike, 2014; Barro and Sala-i-Martin, 2004; Bloom and Williamson, 1998; Iqbal et al., 2015; Laxminarayan, 1970; Jamir and Ezung, 2017a; Jamir and Ezung, 2017b). For decades, researchers and policymakers have discussed the essence of the relationship between population and economic growth. High and unregulated fertility rates lead to rapid population growth, which pushes per capita consumption below the subsistence level, according to Malthus' claim (Malthus, 1798). Population pessimists claim that population

growth is disruptive to economic development because it increases demographic overheads, stifling capital accumulation and technological innovation (Coale and Hoover, 1958). "Population optimists" or "boomsters," on the other hand, stress the value of population growth for growing productivity, encouraging technological advancement, and achieving economies of scale (Boserup, 1981). Some research, on the other hand, found no evidence of a substantial effect of population growth on economic development, resulting in "demographic neutralism."

The main research problem this paper address is: Has the population growth promoted economic development in Nagaland from 1981-2011? Or, on the contrary, has the expanding population become an obstacle to the State's economic growth? To answer these questions, standard econometric analyses, such as the regression model was used by using population and economic development determinants, are used in this study to examine the long-run relationship between population growth and economic performance in Nagaland.

METHODOLOGY
Study Area
Nagaland is located in the Far East region of East Asia towards Northern part of Indo-Myanmar mountain ranges. It is situated in the northeastern part of India between 25°6' to 27°4' North latitudes and 93°0' to 95°15' East longitudes, with an area of

about 16,579 sq. km. Nagaland is bounded by the Indian states of Arunachal Pradesh to the northeast, Manipur to the south, and Assam to the west and northwest, and the country of Myanmar to the east.

Nagaland becomes the 16th State of the Indian Union on the Ist December 1963. As per Census 2011, the population of Nagaland is 1,978,502. The State is comprised of 16 administrative districts and 1428 inhabited villages. Each district is inhabited by one or more tribes, thereby imparting to it a distinct linguistic, cultural, traditional, and socio-political characteristic (Census of India, 2011). The Nagas, an Indo-Asiatic people, form more than 20 tribes, as well as numerous subtribes, and each one has a specific geographic distribution. The Konyaks are the largest tribe, followed by the Ao, Angamis, Sumi, and Lotha. Other tribes include the Sangtams, Phoms, Changs, Khiemnungams, Yimkhiung, Puchury, Zeliangs, Chakhesangs, Rengma, Kachari and Kuki.

Nagaland is primarily a land of agriculture and has a population of about 2 million people. The State's population is predominantly rural with about 71.14% of its population living in the rural sector (Census of India, 2011). The terrain is predominantly hilly and is covered by a rich and varied floral and faunal assemblage. People are based on agriculture and allied activities for their sustainable livelihood. Compared to other food crops about 80% of the cropped region is under rice production. The farm production and productivity for all food crops are very low, in contrast to other states. Presently, the Jhum/shifting to terraced cultivation ratio is 4:3 (Nayak, 2013). Forestry is also an important source of income generation for the rural sector (Ghosh, 2016). Nevertheless, agriculture and forestry contribute a majority of Nagaland's Gross Domestic Product (GSDP). Nagaland's GSDP grew at 9.9 percent compounded annually for a decade, thus more than doubling the per capita income (Nagaland Economy Report, 2011-12).
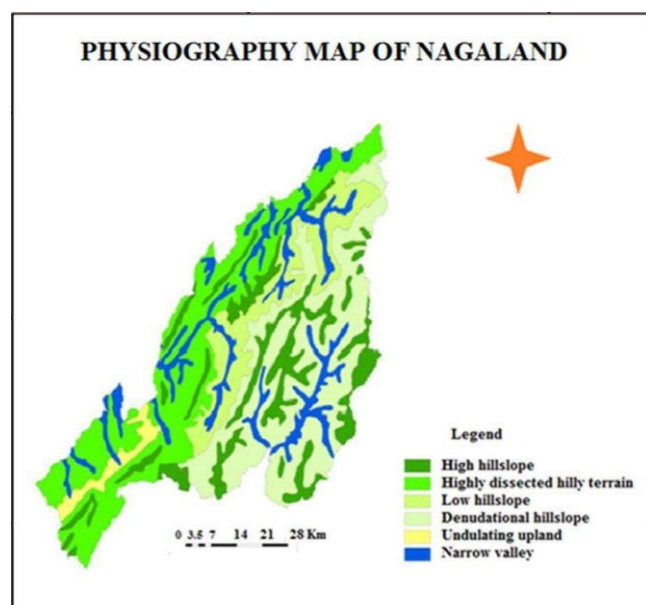

Figure 1. Nagaland; Source: Nagaland Science and Technology Council, Government of Nagaland, Kohima.

Figure 2. Mount Saramati (Kiphire district) located on the Nagaland-Myanmar border; Source: Photo by Dr. Santanu Dey.

Data collection and period of study
The empirical study of population and economic development is based totally on a secondary source. The secondary data were collected during 1981-2011.

Research analysis
Model specification: The regression model was used to study the relationship between each of the dependent variables and the set of the explanatory variables. The model is specified as follows:

$Y=\beta_0+\beta_1X_1+\beta_2X_2+ \ldots + \beta_nX_n+\epsilon$ Where y represents the dependent variable, X_1, X_2........ X_n are the explanatory variables, β_0 is the intercept, β_1, β_2,........... β_n are the regression coefficients and ϵ is a random component.

RESULTS AND DISCUSSION
Demographic transition in Nagaland: A brief review
In 1981, the proportion of the age 0-14 years was 36.84% of the total population which has increased to 37.29% in 1991, and it fell back to 36.60% and 34.30% in 2001 and 2011 respectively. Aged 60 and above was only 5.93% in 1981 and has fallen to 5.27% and 4.73% in 1991, and again rose to 5.3% in 2011 (Table 1 and Figure 3). The decreasing population of young dependents may contribute more to the economic development of the State. The working age population (age 15-59) increased from 57% in 1981 to 57.43%, 58.50% and 60.40% in 1991, 2001 and 2011 respectively. Comparing to 57% in 1981, the subsequent decades of ation is more mature and transitioning to a population structure increasing working population showed that the State's popul marked by a bulge in the working age group, even though the level of dependence population with 39.60% is still quite high. The proportion of the working age population in the State has been steadily increasing over the decades (Statistical Handbook of Nagaland, 1981, 2001, 2011).

Table 1. Age structure of Nagaland over the years.

Age	1981	1991	2001	2011
0-14	285536 (36.84)	451044 (37.29)	728409 (36.60)	679032 (34.3)
15-59	440972 (57.0)	694725 (57.43)	1164082 (58.50)	1195273 (60.4)
60 & above	46022 (5.93)	63777 (5.27)	94315 (4.73)	104197 (5.3)
Total	774930	1209546	1990036	1978502

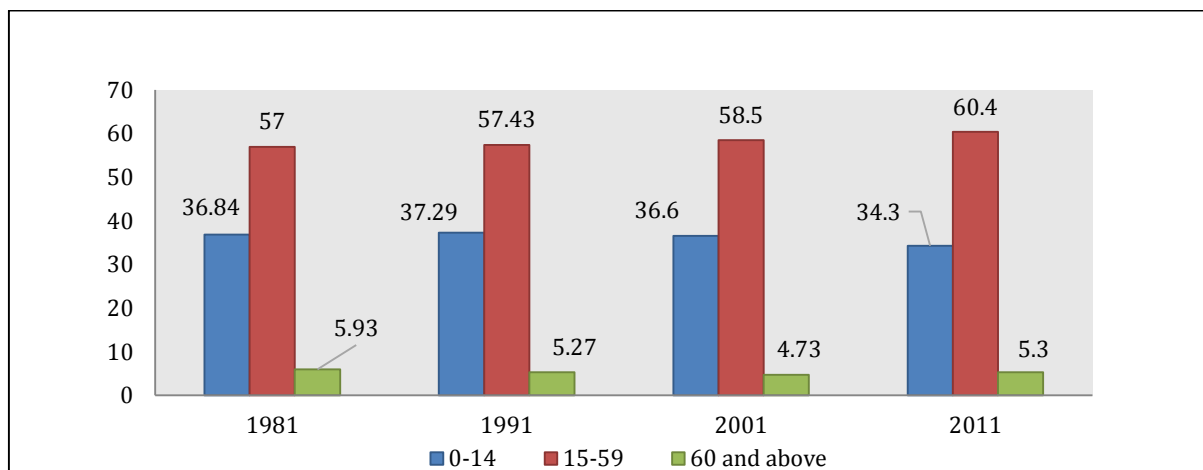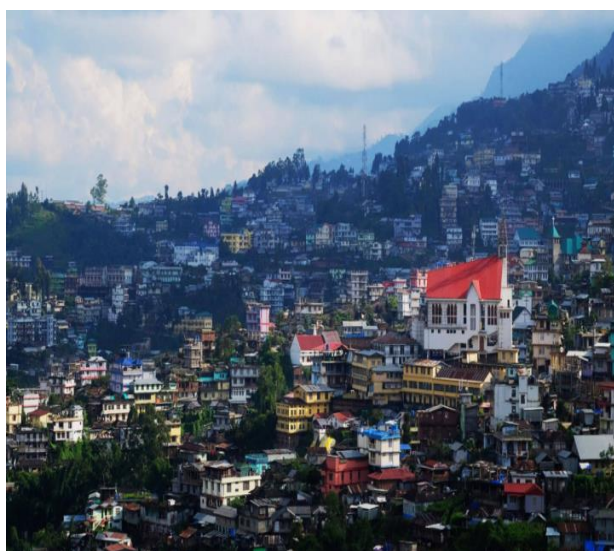Source: Statistical Handbook of Nagaland 1981, 1991, 2001 and 2011.

Figure 3. Age structure of population; Source: Statistical Handbook of Nagaland 1981, 1991, 2001 and 2011.

Kohima town (Photo by Dr. Chubakumzuk Jamir).

Dimapur town (Gate way of Nagaland; Dimapur district).

Figure 4. Population growth and economic development in Nagaland.

Table 2. Share of working population and dependents.

Age	1981	1991	2001	2011
0-14 & 60 and above	42.77	42.56	41.33	39.60
15-59	57.00	57.43	58.50	60.40

Source: Statistical Handbook of Nagaland 1981, 1991, 2001 and 2011.

The Table 1 and 2 provides a detailed breakup of the age composition of the population of the State. Both the Table 1 and Figure 3 shows that in the 1991 census, the State was marked by a very wide base showing a high population ratio of children, adolescent and young adult population. Children in the 0-14 year age group consisted of 451044 from a total population of 1209546 or formed a percentage of 37.29%.

Aged 60 and above were only 63777 or 5.27% of the total population. This showed that the dependency ratio in the young age population was quite high though the dependent population among the elderly was insignificant. An implication of the population structure showed that a significant amount of investment in human capital in the form of investment in education and health was required for tapping demographic

dividends in the subsequent years. Children made up a significant proportion of the population showed that the State was in a high population growth phase where the birth rate was much higher than the death rate. The male-female population ratio of 53:47 in favour of male showed a significant gender imbalance (Nair, 1974; Islam, 1989). Also, since more developed societies usually have either a bulging area in the middle showing the second phase of demographic transition or even a very narrow base widening up along the age cohort, the perfect-pyramid shape of the age structure showed that the State is still in the first stage of demographic transition marked by a low level of economic development.

Table 3. Population age structure of Nagaland, 1991 Census.

Age	Male	Female	%Male	%Female	Total
0-4	69658	70079	5.76%	-5.79%	139737
5-9	79105	76320	6.54%	-6.31%	155425
10-14	80260	75622	6.64%	-6.25%	155882
15-19	73879	67672	6.11%	-5.59%	141551
20-24	63642	54199	5.26%	-4.48%	117841
25-29	52693	47893	4.36%	-3.96%	100586
30-34	39654	35600	3.28%	-2.94%	75254
35-39	38159	33206	3.15%	-2.75%	71365
40-44	33212	25782	2.75%	-2.13%	58994
45-49	28867	21951	2.39%	-1.81%	50818
50-54	22012	16065	1.82%	-1.33%	38077
55-59	14029	10099	1.16%	-0.83%	24128
60-64	13248	9527	1.10%	-0.79%	22775
65-69	7815	5747	0.65%	-0.48%	13562
70-74	6202	4442	0.51%	-0.37%	10644
75-79	3541	2502	0.29%	-0.21%	6043
80-84	3431	2305	0.28%	-0.19%	5736
85+	3179	1838	0.26%	-0.15%	5017
Age not specified	8696	7415	0.72%	-0.61%	16111
Total	641282	568264	53.02%	-46.98%	1209546

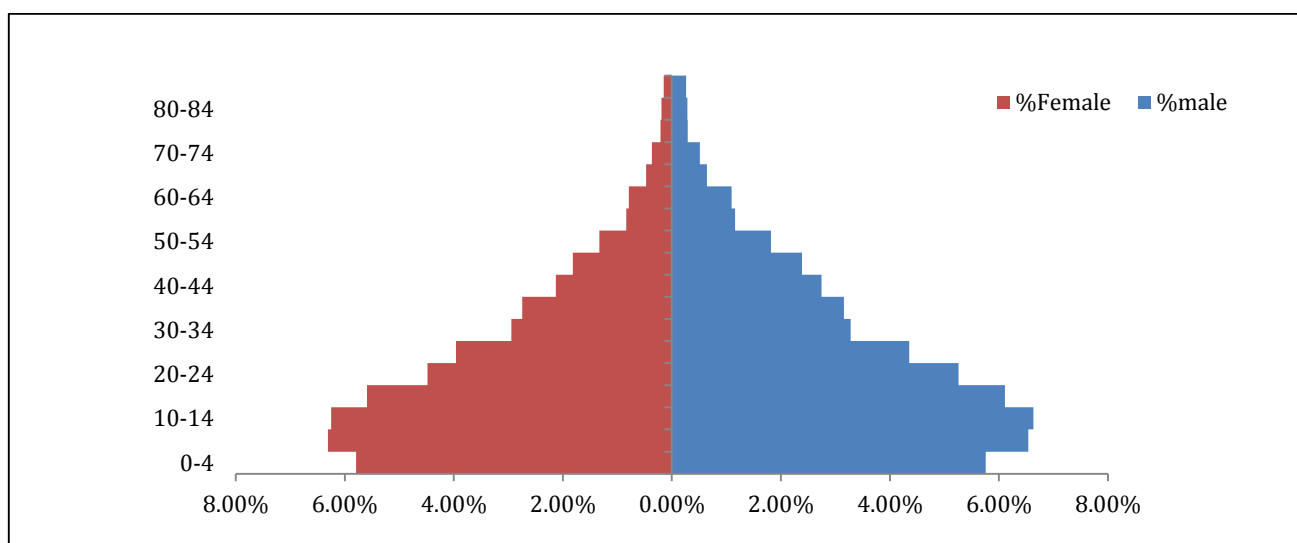Source: Statistical Handbook of Nagaland 1991.

Figure 5. Population distribution by age and gender for Nagaland, 1991.
Source: Statistical Handbook of Nagaland 1991.

Table 1 shows that while there were changes in the absolute number of the population figure in 2001 as compared to the 1991 census, the percentage change was minuscule. While the number of children in the age group of 0-14 years increased to 728409 in 2001 from 451044 in 1991, which was an increase of 61.49%, the percentage of 0-14 years as a percentage of the total population in the two censuses was 37.29% and 36.60% in 1991 and 2001 respectively, showing no big divergence. The data of 445190 representing the number of children born between 1991 and 2001 also showed that the number of children being born was still very high. The increase in the senior and old age population, implying improving life expectancy, meant that this decade was a decade of high population growth (Table 4 and Figure 5 and 6). The number of people 60 years and above as a percentage of the total population however fell between 1991 and 2001 from 5.27% to 4.73%. This fall was a result of an increase in other components of the population, namely children and the working age population. The working age population increased slightly to 58.50% in 2001 from 57.43% in 1991. This was a marginal increase underlying a high dependency level of 41.14%. The male-female population ratio improves from 57:43 to 56.60:47.40.

Table 4. Population age structure of Nagaland, 2001 Census.

Age	Male	Female	Male%	Female%	Total
0-4	94857	92803	4.77%	-4.66%	187660
5-9	133580	123950	6.71%	-6.23%	257530
10-14	147721	135498	7.42%	-6.81%	283219
15-19	139923	126181	7.03%	-6.34%	266104
20-24	110221	99709	5.54%	-5.01%	209930
25-29	83129	80313	4.18%	-4.04%	163442
30-34	64536	58371	3.24%	-2.93%	122907
35-39	63725	58499	3.20%	-2.94%	122224
40-44	50914	44070	2.56%	-2.21%	94984
45-49	47494	39769	2.39%	-2.00%	87263
50-54	35162	24810	1.77%	-1.25%	59972
55-59	22543	17191	1.13%	-0.86%	39734
60-64	18067	13680	0.91%	-0.69%	31747
65-69	11610	9347	0.58%	-0.47%	20957
70-74	8348	6533	0.42%	-0.33%	14881
75-79	5001	4126	0.25%	-0.21%	9127
80-84	3604	2723	0.18%	-0.14%	6327
85+	4106	3178	0.21%	-0.16%	7284
Age not Specified	2600	2144	0.13%	-0.11%	4744
Total	1047141	942895	52.62%	-47.38%	1990036

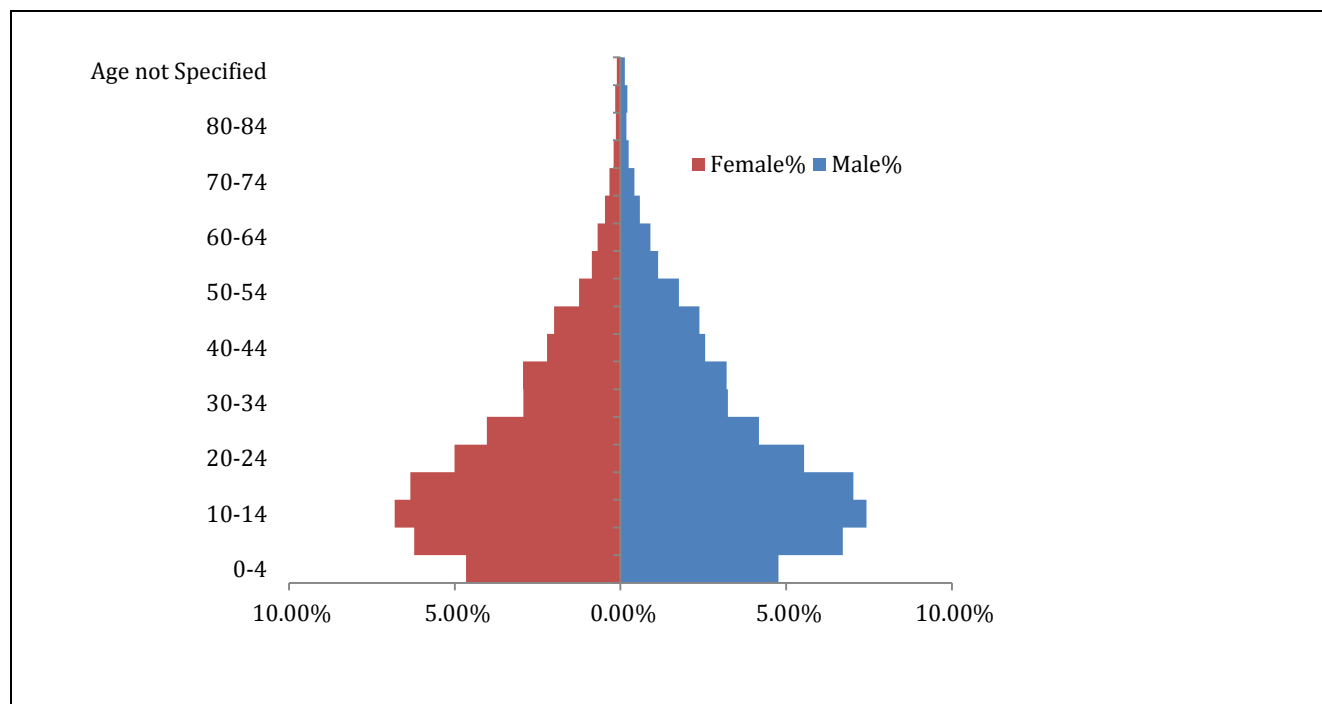Source: Statistical Handbook of Nagaland 2001.

Figure 6. Population distribution by age and gender for Nagaland, 2001
Source: Statistical Handbook of Nagaland 2001.

Between the 2001 census and the 2011 census, a fall in the proportion of children in the age group of 0-14 years is noticed. Children as a proportion of the total population had fallen compared to the previous from 36.60% (2001) to 34.3% (2011), a fall of -2%. The working-age population increased from 58.5% (2001) to 60.4% (2011). Compared with 1991 (57.43%), the decade showed the State's population maturing and transitioning to a population structure marked by a bulge in the working age group though the level of dependence was still significant at 39.54%, with a slight increase in the senior population from 4.54% (2001) to 5.20% (2011). Children born in this decade were 430361, which made up 21.77% of the total population. Even with a declining population between 2001 and 2011, the number of children being born was still significant. Another trend that can be noticed is the improvement in the female-male ratio with the male-female ratio improving to 51.78:48.22 in 2011 from 56.60:47.40 in 2001.

Table 5. Population age structure of Nagaland, 2011 Census.

Age	Male	Female	Male%	Female%	Total
0-4	101291	95971	5.12%	-4.85%	197262
5-9	120647	112452	6.10%	-5.69%	233099
10-14	129237	119434	6.54%	-6.04%	248671
15-19	117994	111628	5.97%	-5.65%	229622
20-24	103769	100594	5.25%	-5.09%	204363
25-29	89598	87303	4.53%	-4.42%	176901
30-34	76505	73419	3.87%	-3.71%	149924
35-39	64695	63503	3.27%	-3.21%	128198
40-44	57653	51608	2.92%	-2.61%	109261
45-49	47757	39990	2.42%	-2.02%	87747
50-54	36134	29725	1.83%	-1.50%	65859
55-59	23741	19657	1.20%	-0.99%	43398
60-64	19683	16836	1.00%	-0.85%	36519
65-69	12801	11442	0.65%	-0.58%	24243
70-74	9260	8333	0.47%	-0.42%	17593
75-79	5635	4930	0.29%	-0.25%	10565
80-84	3728	3294	0.19%	-0.17%	7022
85+	3672	3112	0.19%	-0.16%	6784
Total	1023800	953231	51.78%	-48.22%	1977031

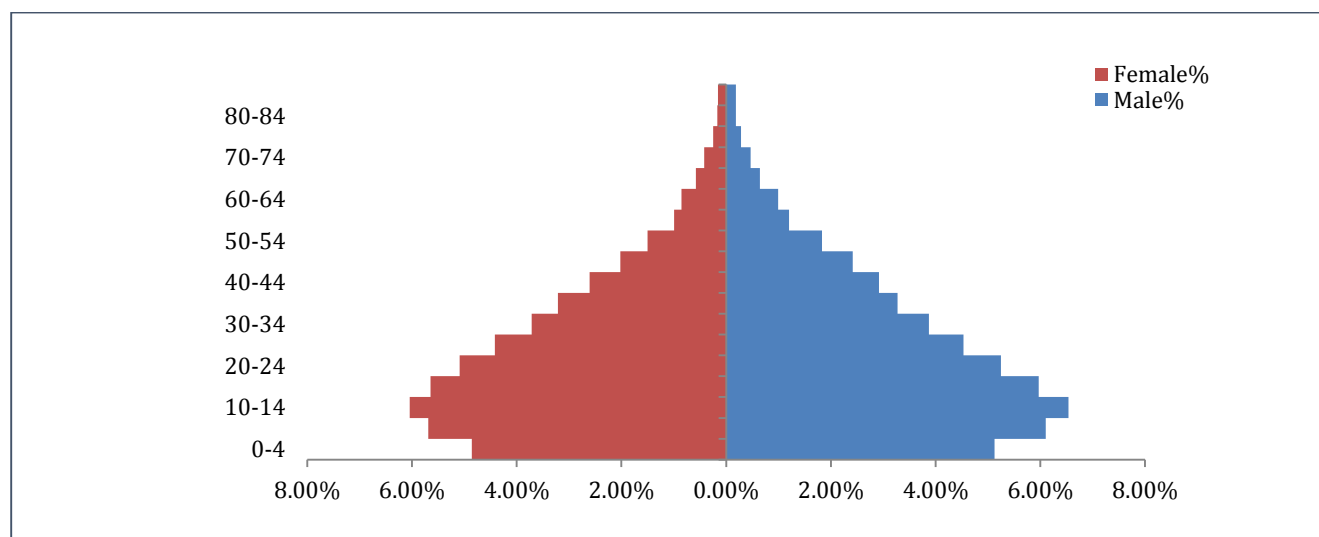Source: Statistical Handbook of Nagaland 2011.

Figure 7. Population distribution by age and gender for Nagaland, 2011.
Source: Statistical Handbook of Nagaland 2011.

The study found that in the census of population 1991, 2001, and 2011, one can draw certain conclusions to questions raised at the beginning. While the State's population growth was negative between 2001 and 2011 but the number of children added is still significant. Barring some unforeseen exigencies, one can expect the population to grow further. The base of the population pyramid is still very wide, with a very narrow tip at the top (Table 5, Figures 5, 6, and 7). A transition toward a more cylindrical shape pyramid or a narrow base is still a long way to go. The population decline between 2001-2011 could be an aberration rather than a trend to be noticed in future years. The State is still marked by a high dependency ratio, especially among children. This calls for significant investment in human capital to tap demographic dividends. At the same time, there is a steady increase in the working-age population. This calls for ways to create meaningful employment. However, as birth rates fall and medical facilities improve with economic growth, this is expected to increase though the State did witness a fall in old age population

proportion between 1991 and 2001. However, it has to be noted that even in that decade, the absolute number of people aged above 60 increased. An encouraging trend from a socio-economic perspective is the improvement in the gender dimension with female-male ratio improving consistently over the decades in the study. There are, however, questions that cannot be answered by looking at the data presented. The biggest question is the high growth rate of the population of 64% between 1991-2001 and negative population growth between 2001-2011. As pointed out, this could be an aberration rather than the norm going ahead.

Decreasing Share of Cultivators and Agriculture Labourers
Nagaland's economy has seen a fall in the contribution of the agricultural sector to the State's gross domestic product (see Figure. 8, 9, 10 and 11). This is in conformity with the theory of structural transformation, which states that an economy moves from the agrarian sector, then to the secondary sector and finally to the service sector. While the State's agricultural

contribution to State's GSDP is falling, agriculture still occupies an important place in the State's economy as it employs the highest amount of labour. The State's agriculture sector employed 72.03% of the labour force in 1981. This fell marginally to 71.39% in 1991 and then further to 68.21% in 2001. The decreasing importance of agriculture can be seen in the 2011 Census, where there was a 7% fall between 2001 and 2011. In terms of absolute figures, the highest increase in the agricultural labor force was seen between 1991 and 2001 where though the proportion of people employed in the agricultural sector as a ratio of the total labor force had marginally fallen, there was an addition of 209,734 workers to the agricultural sector. By contrast, between 2001 and 2011, there was an addition of only 22,380 workers to the agricultural workforce in the State (Table 6).

Table 6. Cultivators and agriculture labourers.

Year	Absolute term	% to total workforce
1981	269220	72.03
1991	368550	71.39
2001	578284	68.21
2011	600664	61.66

Source: Compiled by self from State's census data 1981, 1991, 2001 and 2011.

Practice of terrace cultivation

Figure 8. Khonoma village (Kohima district)
Source: Department of Agriculture
(Government of Nagaland)

Figure 9. Pfutsero (Phek district)
Source: Department of Agriculture
(Government of Nagaland)

Practice of Jhum cultivation

Figure 10. Wokha district
Source: Photo by Dr. Santanu Dey

Figure 11. Kiphire district
Source: Photo by Dr. Santanu Dey

Stagnant Household Industry Workers
A falling share of workers employed in the agricultural sector assumes an increase in the industrial sector. Since the manufacturing sector is more productive than the agricultural sector, economies which have dominated the world in history had come about as a result of strides made in the manufacturing sector. India realized the importance of the manufacturing sector quite early after independence with the Mahalanobis Model of the Two Sector Model of the 2nd Five year plan being a prime example. The Make in India program, albeit its failure to take off, given by Narendra Modi as soon as he assumed power in 2014 also shows how India has given importance to the manufacturing sector.

In Nagaland too, much emphasis has been given to the manufacturing sector. However, the State has been marked by sick industrial units, low and sporadic investment, lack of accountability and transparency, and a failure of existing units to run at full capacity. The State lacks basic infrastructure in areas such as communication and transport; it also lags behind in other critical areas such as finance and technical know-how (Jamir, 2021a; Jamir, 2021c; Ezung and Jamir, 2018; Jamir and Ezung, 2020). Political unrest, a weak state government, and a lack of proper institutional mechanisms have also contributed to the failure of the manufacturing sector taking-off. The lack of the industrial sector can be seen from the data presented in Table 7, where the total workforce in the household industry sector while increasing, is only 2.29% as of 2011. The highest increase both in percentage and absolute terms of workers in the household industry sector or broadly the manufacturing sector was between 1991 and 2001 when the total workforce in the manufacturing sector increased from 7649 and more than doubled to 18072 for a rise of 136.26% within the ten year period (Figure 16, and 17).

Table 7. Household industry workers.

Year	Absolute term	% to total workforce
1981	1461	0.39
1991	7649	1.15
2001	18072	2.13
2011	22338	2.29

Source: Compiled by self from State's census data 1981, 1991, 2001 and 2011.

Fluctuations in Other Occupational Categories
Besides the primary and secondary sectors, workers are employed in the tertiary sector, characterized in the Census data as 'Others' consisting of the State's administration, hoteliers, shopkeepers, sports persons, teachers, politicians, lawyers, and so on. The State has seen dramatic changes in this sector. It has been shown from Tables 7 and 8 that the State is seeing a steady decline in the proportion of workers employed in the agricultural sector. The table has shown the failure of the manufacturing sector to absorb the workers released from the primary sector. The result has been a dramatic increase in the marginal as well as fluctuations in the service sector. There was a steady decline in the proportion of workers employed in this sector from 1981 to 2001. However, between 2001 and 2011, there has been a dramatic rise in the proportion of workers employed in this sector. Though the increase in absolute numbers have not been as high between 1991 and 2001 where the absolute number increased from 128775 to 253625 for an increase of 124850 or 96.95%, owing to the overall population lying steady between 2001 and 2011, the increase of workers in this sector to 3.5 lakhs in 2011 from 2.5 lakhs has resulted in the proportion of workers in this sector to shoot up to 35.99% from 22.91% or an increase of 13.08% within a decade.

Table 8. Workers in tertiary sector.

Year	Absolute term	% to total workforce
1981	97640	26.12
1991	128775	24.94
2001	253625	22.91
2011	350620	35.99

Source: Compiled by self from State's Census data 1981, 1991, 2001 and 2011.

Increase in Marginal Workers
The State has seen a dramatic increase in the number of marginal workers. The number of marginal workers as of 1981 was 5433, which fell to 4740 in the 1991 Census. However, this jumped to 1.43 lakhs in the 2001 Census and continued to increase to 2.33 lakhs, according to the 2011 Census. The number of main workers has risen in tandem with the total population. As a result of the mismatch between the growth rate of main and marginal workers, the ratio of marginal workers to main workers have risen dramatically in 2001. This can be seen from Table 9 where the ratio of marginal workers to 1000 main workers stood at 14.75 and 9.26 in the 1981 and 1991 censuses, respectively and jumped to 204.29 and 314.28 in 2001 and 2011 censuses respectively (Table 9).

Table 9. Dramatic increase in marginal workers.

Year	Marginal workers	Main workers	Total workers	Proportion of marginal workers to 1000 main workers
1981	5433	368321	373754	14.75
1991	4740	511497	516237	9.26
2001	143819	703977	847796	204.29
2011	232943	741179	974122	314.28

** Total workers (Marginal workers + Main workers); Source: Compiled by self from State Census data 1981, 1991, 2001 and 2011.

Steady Decline in Percentage of Main Workers to Total Population

Table 10 shows the number of marginal workers has increased dramatically in the 2001 census and the 2011 census. Accompanied by increasing marginal workers is a steady decline in the proportion of main workers to the total population. This is presented in Table 11.

Table 10. Percentage of main workers to total population.

Year	% of main workers
1981	47.52
1991	42.28
2001	35.37
2011	37.46

Source: Compiled by self from Census data 1981, 1991, 2001 and 2011.

Table 11. Distribution of main workers according to occupation since 1981 census.

Occupational distribution	1981	1991	2001	2011
Cultivators and agriculture labourers	269220 (72.03)	368550 (71.39)	578284 (68.21)	600664 (61.66)
Household industry workers	1461 (0.39)	7649 (1.15)	18072 (2.13)	22338 (2.29)
Other workers	97640 (26.12)	128775 (24.94)	253625 (29.91)	350620 (35.99)
Total main workers	368321	511497	703977	741179
Total marginal workers	5433	4740	143819	232943
Total main and marginal workers	373754	516237	847796	974122
Non-workers	4001176	693309	1142240	1004380
Total population	774930	1209546	1990036	1978502
Percentage of main workers to total population	47.52	42.28	35.37	37.46
Percentage of main and marginal workers to total population	48.23	42.68	42.60	49.23
Percentage of marginal workers to total population	0.70	0.39	7.22	11.77
Percentage of non-workers to total population	51.64	57.32	57.40	50.77

Source: Compiled by self from Census data 1981, 1991, 2001 and 2011.

Structural Transformation by Sectoral Contribution to State's GSDP

The above section has mentioned how the participation of the workforce in the State shows that the State is not following the same path of economic development and how the industrial sector or the secondary sector has been skipped all along. Data on sectoral contribution to State's GSDP reveals a similar pattern of a falling share of the primary sector, a fluctuating (with a decreasing and then increasing) trend of the secondary sector, and an increasing share of the tertiary sector (Table 12, 13 and 14).

As explained by Rostow, the traditional society implies a phase of economic stagnation where the level of output per capita is low or more or less remains constant over a period of time. Further, agriculture happens to be the main source of income for the State, and more than 75% of the population is engaged in the stage of traditional society. When Nagaland attained its statehood in 1963, the economy was in the stage of almost 'traditional society'. Agriculture was the backbone of the economy, where more than 85% of the population was engaged in agriculture for livelihood. Further, the technique of production was more or less pre-Newtonian type having a very low per capita output. Further, there was not only a lack of inventiveness and innovations but also lack of effectiveness in the physical world of the post-Newtonian era. "The pre-condition for take-off" in Rostowian term is a stage of economic transition during which the institutional organization of the economy gradually begin to change and respond to economic growth. The rate of net investment rises and gradually tends to outstrip population growth. The build-up of social overhead capital grows, and an infrastructural base for growth is created. Some technical changes are also introduced in agriculture, which raises its productivity. As explained by Rostow, the process of creating pre-conditions for take-off from traditional society is the result of the following. "New type of enterprising men comes forward in the private economy and government enterprise, or both, willing to mobilize savings and take risks in pursuit of profit to modernization. Investments increase, notably in transport, communications, and raw materials in which other states may have an economic interest (Rostow, 1953, 1959, 1971).

Tourism development in Nagaland

Figure 12. Hornbill festival in Kisama
(Kohima district)
Source: Photo by Dr. Santanu Dey

Figure 13. World capital of Amur Falcon bird
(Wokha district)
Source: Department of Tourism
(Government of Nagaland)

Figure 14. Tourist village Touphema
(Kohima district)
Source: Department of Tourism
(Government of Nagaland)

Figure 15. Green village Khonoma
(Kohima district)
Source: Department of Tourism
(Government of Nagaland)

Table 12. Sectoral contribution to State's GSDP.

Sectors	1971-72	1981-82	1991-92	2001-02	2011-12
Primary	36.28	37.63	32.18	33.38	26.71
Secondary	25.12	12.47	8.49	10.86	13.73
Tertiary	38.60	49.89	59.32	55.74	59.55

Source: Statistical Handbook of Nagaland 1971, 1981, 1991, 2001 and 2011.

Table 13. District-wise occupational structure in Nagaland.

1971	1981	1991	2001	2011	Remarks
	269220	368550	578284	600664	Agri-sector
Nagaland	1461	7649	18072	22338	Household Ind.
	97640	128775	253625	350620	Others
	64756	86776	79444	46882	Agri-sector
Kohima	782	2998	4504	2072	Household Ind.
	46236	56425	50741	65871	Others
	29755	35689	72981	58250	Agri-sector
Phek	50	256	1442	1275	Household Ind.
	6920	10869	16723	20752	Others
	18889	25794	57121	53911	Agri-sector
Wokha	89	366	1435	1965	Household Ind.
	5513	8374	17723	22536	Others
	21780	27294	63781	56678	Agri.-Sector
Zunheboto	103	192	776	2025	Household Ind.
	5989	12149	31898	20762	Others
	29495	37854	72258	58091	Agri.-sector
Mokokchung	293	1564	4056	3798	Household Ind.
	12666	16896	32465	38178	Others
	65734	88947	191542	79125	Agri.- sector
Tuensang	65	2044	1562	1104	Household Ind.
	13119	16127	24990	17925	Others
	38535	66201	114119	124309	Agri.-sector
Mon	75	229	1521	1608	Household Ind.
	7197	8135	13275	21737	Others
			33674	33507	Agri.-sector
Dimapur	---	---	2776	5073	Household Ind.
			65810	112770	Others
				43410	Agri.-sector
Peren	---	---	---	2571	Household Ind.
				15409	Other
				22691	Agri.- sector
Kiphire	---	---	---	749	Household Ind.
				8519	Others
				23810	Agri.-sector
Longleng	---	---	---	598	Household Ind.
				6160	Others

Source: Statistical Handbook of Nagaland 1981, 1991, 2001 and 2011.

Infrastructure development zone

Figure 16. Special Export zone Ganeshnagar
(Dimapur district)
Source: Department of Industries and Commerce
(Government of Nagaland)

Figure 17. Power grid Ganeshnagar
(Dimapur district)
Source: Department of Industries and Commerce
(Government of Nagaland)

Table 14. Age structure of the Nagaland state (1981, 1991, 2001 and 2011).

Age groups	1981	1991	2001	2011
0-14	285536 (36.84)	451044 (37.29)	728409 (36.60)	679032 (34.3)
15-59	440972 (57.0)	694725 (57.43)	1164082 (58.50)	1195273 (60.4)
60 and above	46022 (5.93)	63777 (5.27)	94315 (4.73)	104197 (5.3)
Total Population	774930	1209546	1990036	1978502
NSDP (in Lakh)	13078	69148	386411	1278809
PCI	1688	5717	17222	646352
Agricultural Productivity MT/hectare	.886	1.119	1.493	2.011

Source: Statistical Handbook of Nagaland 1981, 1991, 2001 and 2011.

Impact of age structure and NSDP, PCI and agricultural productivity

The correlation between 15-59 of age group populations and NSDP comes out to be 0.97. The R^2 indicates that 94.80% of the observed variability in NSDP is explained by the independent variable, i.e., 15-59 years of age group. The regression coefficient shows that an additional increase in the population between 15-59 years of age increases the NSDP by 4.1 times. Therefore, the value of b is significant at 5%.

The estimated correlation between 15-59 of age group populations and PCI comes out to be 0.99. The R^2 indicates that 99% of the observed variability in PCI. The coefficient shows

that an additional increase in the population between 15-59 years of age increases the PCI by 2.37 times. Therefore, the value of b is significant at 5%.

The correlation between 15-59 of age group populations and agriculture productivity comes out to be 0.94. The R^2 indicates that 88% of the observed variability in agriculture productivity. The regression coefficient shows that an additional increase in population between 15-59 years of age increases agriculture productivity by 1.25 times. Therefore, the value of b is significant at 5%. Hence, demographic transition has a positive impact on economic development. Therefore, the hypothesis is accepted.

Table 15. Relationship between age, NSDP, PCI and agriculture productivity.

Parameters (Y)	X	Correlation		Regression			
		r	a	b	R^2	't'	S.E
NSDP	15-59	0.97	-48.57	4.108	0.94	6.028**.	0.68
PCI	15-59	0.99	-23.39	2.37	0.99	10.46 **.	0.22
Agriculture productivity	15-59	0.94	-4.574	1.250	0.88	3.979 **.	0.31

Source: Computed (Figures in parentheses indicate t-values)
Note: * Significant at the 0.01 level; ** Significant at the 0.05 level; *** Significant at the 0.10 level.

Table 16. Relationship between different sector and working population.

Parameters (Y)	X	Correlation		Regression			
		r	a	b	R^2	't'	S.E
Primary	Agri-workers	0.98	-51.96	4.83	0.97	8.14	0.59
Secondary	Household (workers)	0.93	-4.30	1.55	0.86	3.58	0.93
Tertiary	Other workers	0.98	-30.24	3.43	0.96	7.64*	0.98

Source: Census of India and Statistical Handbook of Nagaland 1981, 1991, 2001, 2011.
Note: * Significant at the 0.01 level; **. Significant at the 0.05 level; ***. Significant at the 0.10 level.

The correlation between agri-workers and the primary sector comes out to be 0.98. The R^2 indicates that 97% of the observed variability in the primary sector is explained by the independent variable, i.e., agri-workers. The regression coefficient shows that an additional increase in the population of agri-workers increases the primary sector by 4.83 times. The t-test analysis has shown that the impact of agri-workers on the primary sector is statistically significant at 1%.

The estimated correlation between household industry workers and the secondary sector comes out to be 0.93. The R^2 indicates that 86% of the observed variability in the secondary sector is explained by the independent variable, i.e., household industry workers. The coefficient shows that an additional increase in the population of household industry workers increases the secondary sector by 1.55 times. The t-test analysis has shown that the impact of household industry workers on the secondary sector is not statistically significant.

The correlation between other workers and the tertiary sector comes out to be 0.98. The R^2 indicates that 96% of the observed variability in the tertiary sector is explained by the independent variable, i.e., other workers. The coefficient shows that an additional increase in population of other workers increases the tertiary sector by 3.44 times. The t-test analysis has shown that the impact of household industry workers on secondary sector is statistically significant at 1%.

CONCLUSIONS

Population growth could be described as a "destiny" that determines the course of economic development. Demographic transition in different districts, however, has been different from each other. This study attempted to provide additional empirical evidence to the ongoing debate about the intricate relationship between population growth and economic development and chose Nagaland as a case

study. The empirical findings of this study indicate that there existed a positive relationship between population growth and economic development in Nagaland over the period 1981-2011 (Mamuneas et al., 2006; Simon, 1989; Pathy, 1976). The study uses the regression analysis model to investigate the relationship between population and economic growth. Here, the empirical result shows there is a positive relationship between the total labour force and per-capita income, NSDP, and agriculture productivity. The neoclassical growth model also reveals that population growth positively contributes to per-capita income growth. It was also discovered that there is a statistically significant relationship between sectors and the working population. Nagaland's changing demographics are creating a strong impulse for state economic development; the policymakers have a vast opportunity to make this potential of demographic dividend a reality for the development of the state economy. Similar studies were done by (Furuoka, 2009; Thornton, 2001; Kuznets, 1967; Thirlwall, 1994). Thus, it was found that with the increase in the working population, there will be a positive impact on economic growth in State.

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