

Demographic Transition: India's Window of Opportunity

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Abstract

Demographic transition leads to a shift in the population's age distribution, characterised by a reduction in the child population and an increase in the working and elderly populations. An increase in the proportion of the working-age population, known as a "demographic dividend" or "window of opportunity", can be considered an essential factor in stimulating a nation's economy. Therefore, this study aims to examine the trends in demographic transition in India and its major states. The published reports from the Census, SRS and other economic tables were used for the analysis. It has been observed that the age distribution in India has shifted due to declining birth and death rates. The potential supporting ratio among major states has increased from 1971 to 2011. Among the Southern states, Kerala and Tamil Nadu had crossed the supporting ratio, indicating that these states had begun to reap the demographic dividend. The relationship between the supporting ratio and the GDP growth rate indicates that demographic dividends have contributed to economic growth. Over the past few decades, the rate of workforce expansion consistently surpassed that of population growth. This trend indicates a notable rise in the working-age population. Generating sufficient employment opportunities is crucial for a country's development.

Keywords: Age pyramid, potential supporting ratio, demographic dividend, labour, economic growth

Introduction

The demographic transition is a concept that describes population changes over time and is used to examine trends in the country's socio-economic development. The progression of demographic transition leads to an age-structural transition, where the child population decreases while the working-age and elderly populations increase. An Increase in

the working-age population occurs during an age structural transition, often known as the "demographic dividend", and is one of the key elements for boosting a nation's economy. Two key aspects contributing to the demographic dividend are the falling birth rate and rising life expectancy. It is known that the demographic dividend does not last long. "Demographic dividend is a one-

time opportunity during a complete cycle of demographic transition" (Lee & Mason, 2006). India is currently experiencing a period of remarkable demographic transformations, and these changes are likely to contribute to a substantially increased labour force in the country. In India, the pace and timing of the demographic transition vary across regions. The nature of changes in the age structure of the population during the demographic transition has various social and economic implications (Navaneetham, 2002). The age-structural transition in India has significantly affected changes in the workforce. As the population undergoes demographic shifts, such as a decline in the share of young dependents and an increase in the working-age population, it directly influences the size, composition and dynamics of the labour force. Numerous studies have investigated the relationship between age-structural transition and economic growth, suggesting that shifts in demographic patterns contribute to economic development by influencing savings and investment (Lee et al., 1997; Mason, 1998; Bloom & Williamson, 1997). James K.S. (2008) highlighted that many developing nations, including India, are experiencing a rapid decline in fertility, which could yield a demographic bonus that could elevate the country to a more substantial economic position.

India is well known for being one of the fastest-growing economies in the world. The United Nations Population Fund (UNFPA) State of World Population Report 2023 states that India will surpass China to become the world's most populous country by mid-

2023. India's population is projected to reach 142.86 crore, compared with China's 142.157 crore, by July 2023. According to this report, 68 per cent of the Indian population is in the 15-to-64-year age group, which offers a significant advantage in terms of a large workforce. Thus, an increase in the working-age population contributes positively to GDP per capita. To gain benefits from this "window of opportunity", much more has to be done in education, employment and health. Therefore, this study examines the demographic transition in India and its major states.

Objectives

- To study the age structural transition in India and major states (region-wise) from 1971 to 2011.
- To find out the changes in workforce participation in India
- To study how the demographic dividend supports the economic growth of the country.

Data and Methodology

This study used data from published Census of India reports from 1971 to 2011, SRS reports, and other economic tables. An analysis was done for India and the major states. The 14 major states selected are grouped into six regions (1) Southern region (Andhra Pradesh, Karnataka, Kerala, Tamil Nadu) (2) Central region (Madhya Pradesh and Uttar Pradesh) (3) Eastern region (Bihar, Odisha, West Bengal) (4) Northern region (Punjab, Haryana and Rajasthan) (5) Western region (Maharashtra and Gujarat) (6) Northeastern region (Assam). Population pyramids for the states are constructed to trace the history of age composition from 1971 to 2011. To

understand the demographic characteristics, various indicators, such as the Dependency ratio, the support ratio, the GDP growth rate, and the work participation rate, were used.

Dependency ratio

This indicator provides insight into the number of people of non-working age relative to working-age people.

$$\text{Dependency ratio} = \frac{P(0-14) + P(60+)}{P(15-59)} \rightarrow (1)$$

Supporting ratio

Supporting ratio is similar to the dependency ratio. Here, taking the population in the age group (25-59) as the numerator and the population of the age group (0-24) and the 60+ population as the denominator. Number of persons aged from 25-59 years per every person aged from (0-24) and (60+). Mathematically, the ratio can be expressed by the following formula.

$$\text{Supporting Ratio} = \frac{W(25-59)}{[(0.9 * P(0-24) + P(60+))]} \rightarrow (2)$$

If the numerator and denominator are the same, then the ratio is one. If it is more than one, it indicates a younger population, signaling the start of the demographic dividend.

Per capita income and Demographic dividend

Here, the concept of a demographic dividend is explained using a basic equation, with GDP per capita used as the measure of economic growth. First, GDP per capita is decomposed in the following equation (*Routledge Handbook Asian Demography*)

$$Y/N = (L/N) * (Y/L) \rightarrow (3)$$

In this equation, Y denotes GDP, N denotes population, and L denotes the

labour force. Then, GDP per capita is expressed as the product of the support ratio (L/N) and labour productivity.

Equation can be rewritten in growth terms as follows (*Routledge Handbook of Asian Demography, 2018*)

$$\text{gr}(Y/N) = \text{gr}(L/N) + \text{gr}(Y/L) \rightarrow (4)$$

Where gr denotes the growth rate, the growth in the support ratio is referred to as the first dividend, and the factors that influence labour productivity provide the second dividend.

Workforce participation

It is defined as the percentage of total workers to the total population.

Findings

Age Structural Transition in India

The age-structural transition of the population across the major states of India over time is compared using age pyramids.

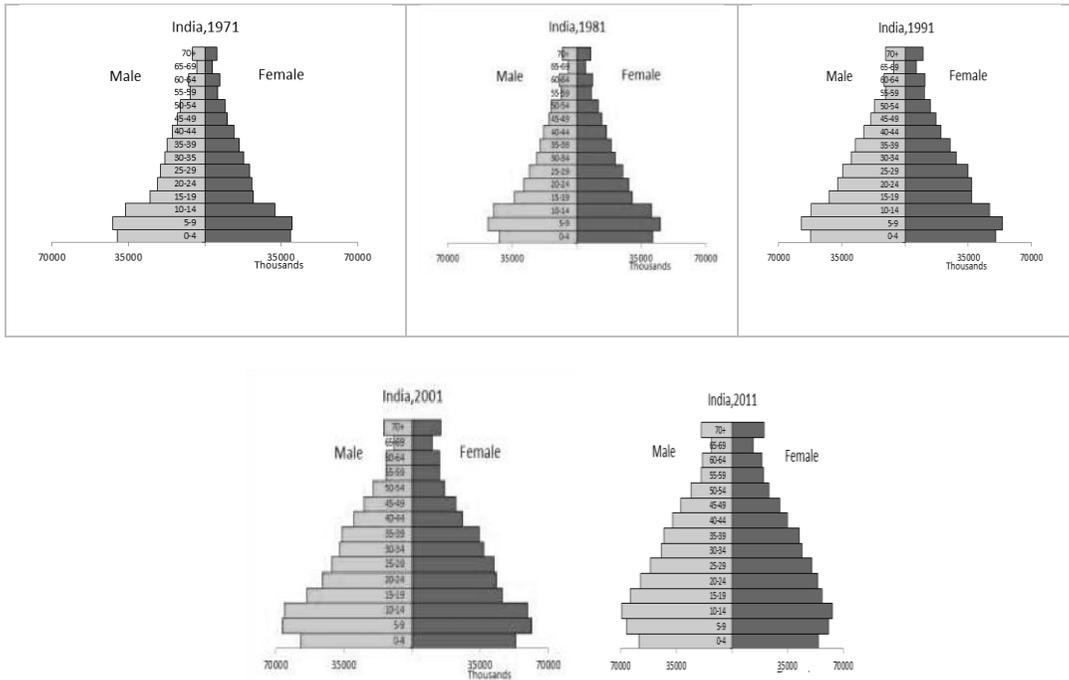
The age pyramid of India from 1971 to 2011 is shown in Figure 1, which helps to analyse the age structure of a population over time. The age pyramid of India, with a broad base up to 2001, indicates a high birth rate. Initially, the population pyramid was wide at the bottom and gradually narrowed over time. By 2011, there was a noticeable decline in the population at lower ages, indicating a recent decline in fertility. The most significant changes happened in the shares of the youngest age groups, 0-4 and 5-9. The age distribution has changed towards the Middle Ages, with a decline in the share of the child population and an increase in the share of adults and

older people. A consequence of recent fertility declines in India was that the age pyramid's conical shape changed

from 1971 to 2011, becoming nearly rectangular.

Figure 1

Age Pyramid of India: 1971-2011



Age Structural Transition in the Southern States of India

The major states are classified into six regions: Southern, Central, Eastern, Northern, Western and Northeastern. Kerala is a state in southern India. The state had already fallen below replacement-level fertility in the 1990s, while some northern states in India were experiencing high or mid-level fertility. Thus, Kerala experienced a decline in growth rate, and the age pyramid exhibits low fertility prevailing in Kerala. Kerala (Fig. 2) displays a conical shape from 1971 to 1991. Then the pyramid forms a box-shaped structure, indicating a significant decline in the child population and an

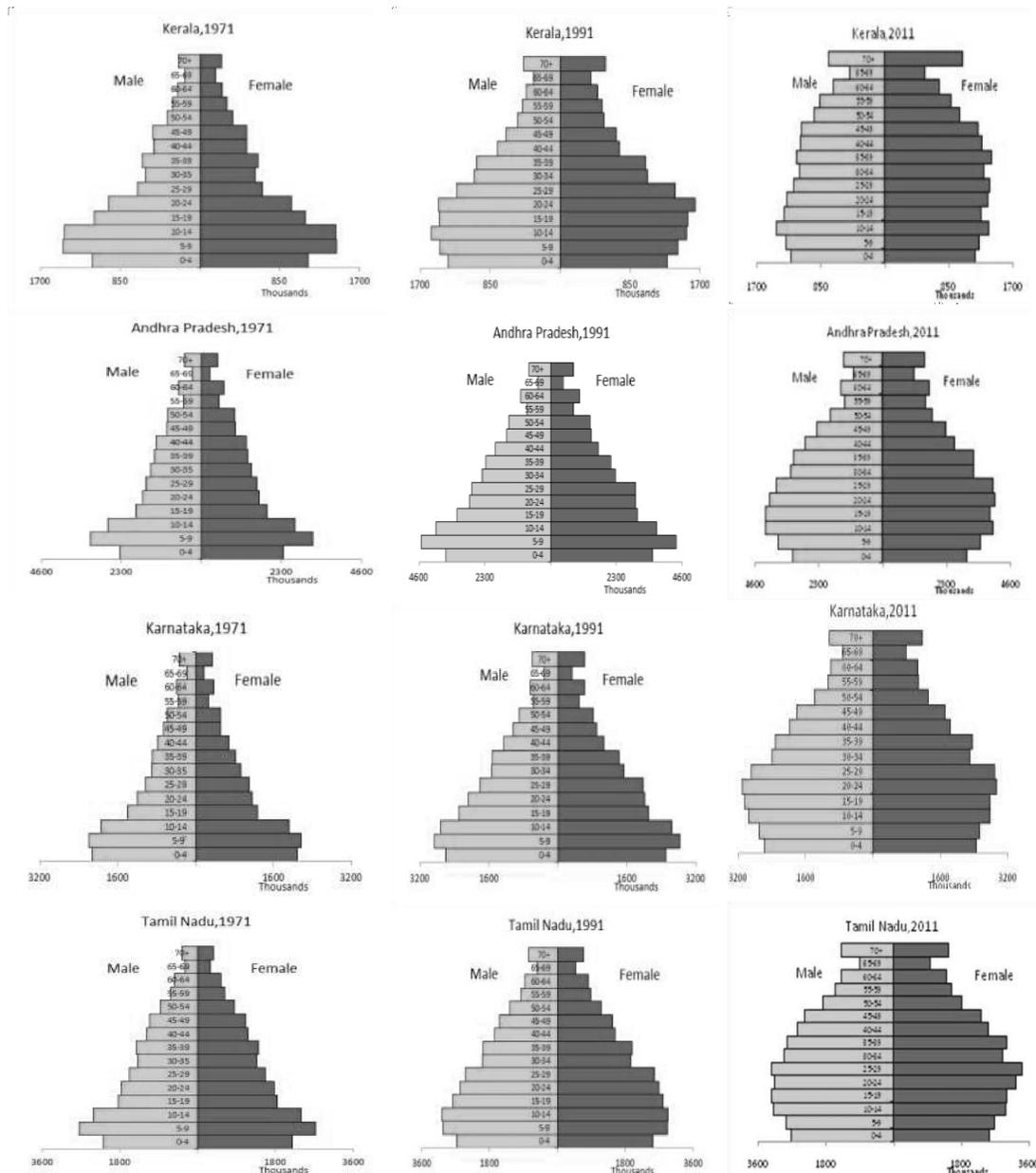
increase in the elderly population. The middle-aged population has also been bulging since 2001. Region-wise analysis of the demographic transition across the states showed that all southern states had experienced declines in the younger age cohorts (0-14) and gains in the economically active age group population. Tamil Nadu has attained the window of opportunity from the middle bulge. Fertility reduction in Karnataka is slower than in other southern states. Although all four southern states showed a comparatively significant decline in the share of the young population, the decline was highest in Kerala. By analysing the pyramid,

Kerala experienced ageing in 2011. Here, the elderly female population exceeded the male population. There was an increase in the share of the

economically active population across 1971-2011 in all four states, with the most significant gain in Tamil Nadu and the smallest in Karnataka.

Figure 2

Age Pyramid of Southern States from 1971–2011



Source: Census 1971-2011

Figure 3

Age Pyramid of States in the Central Region

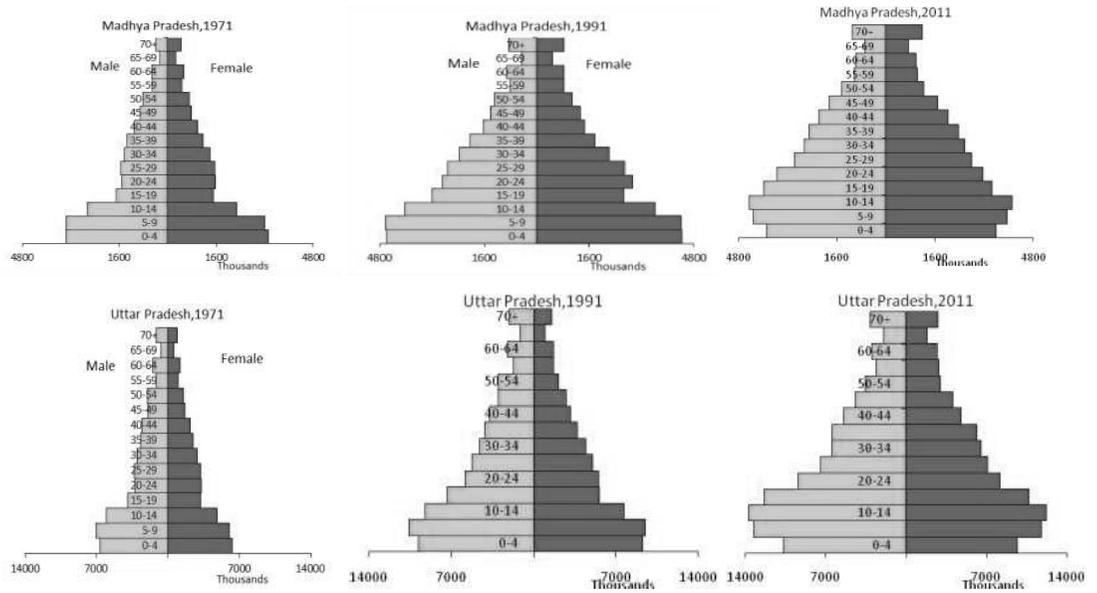
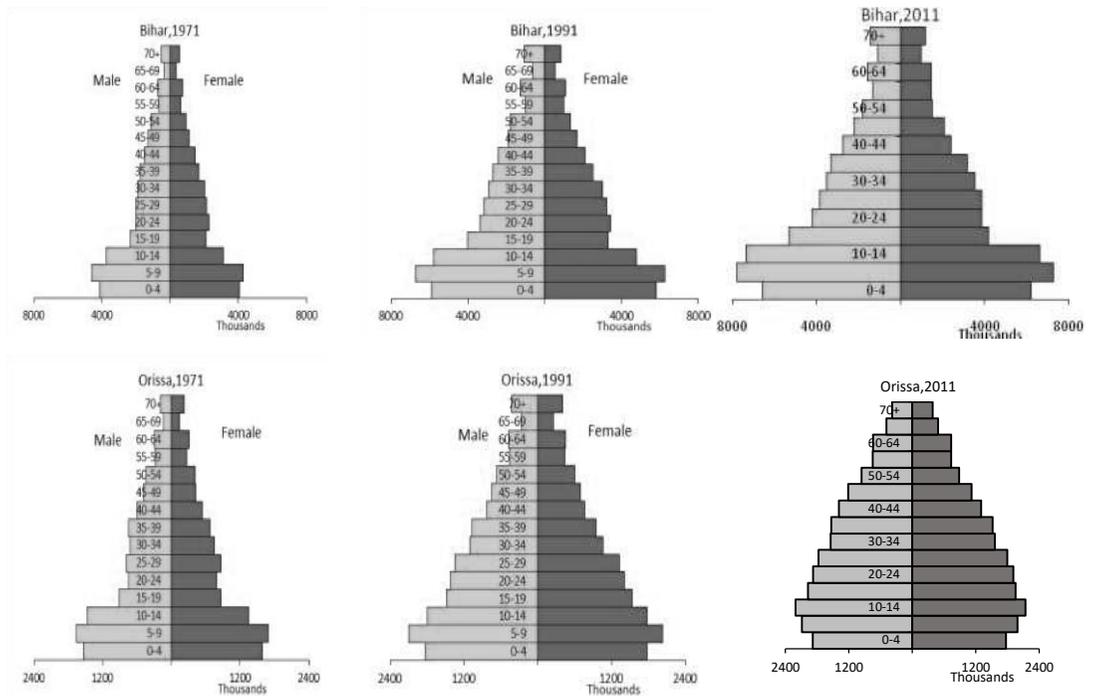


Figure 4

Age Pyramid of States in the Eastern Region



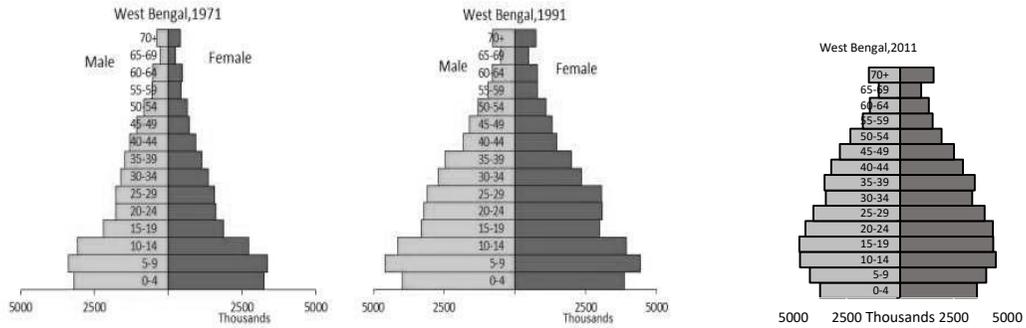


Figure 5
Age Pyramid of States in the Northern Region

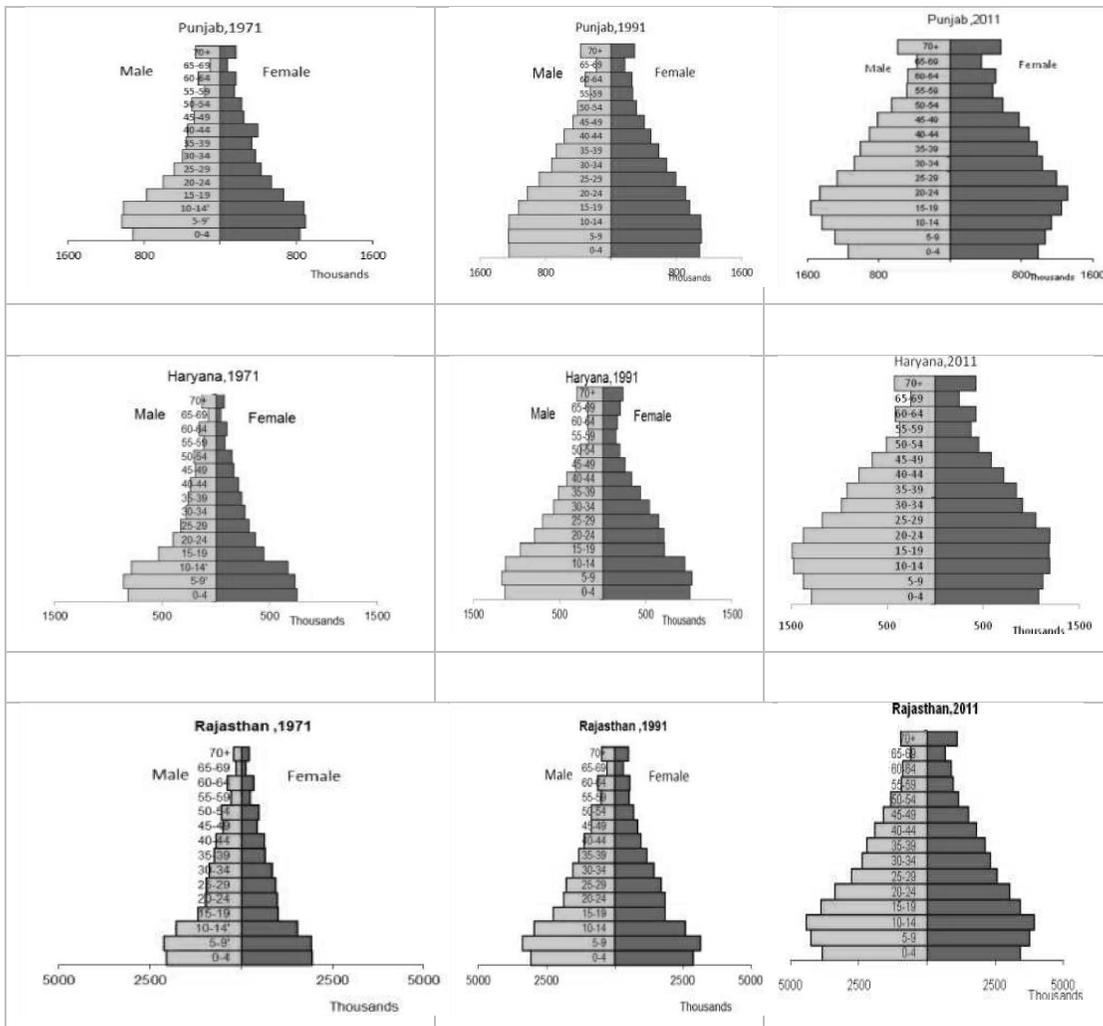


Figure 6

Age Pyramid of States in the Western Region

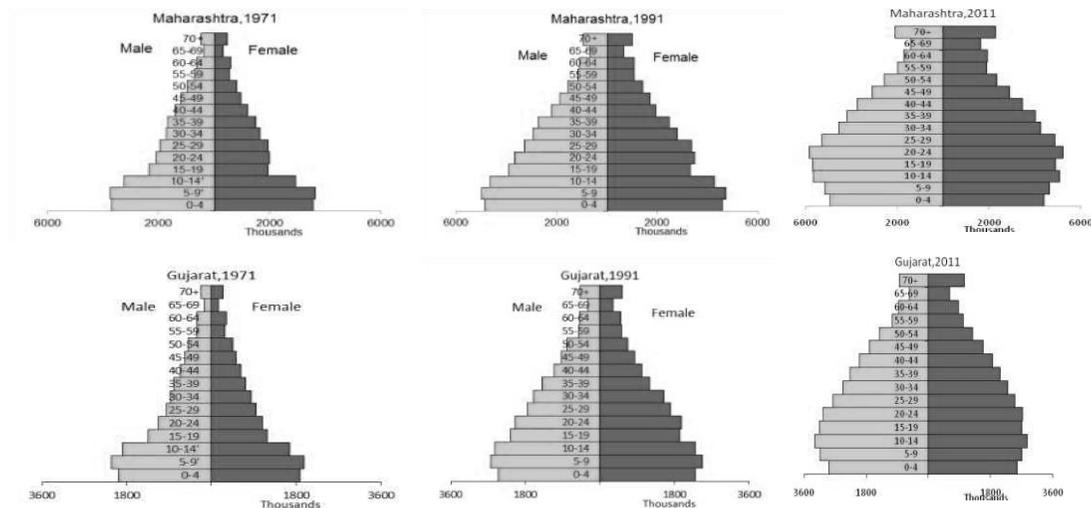
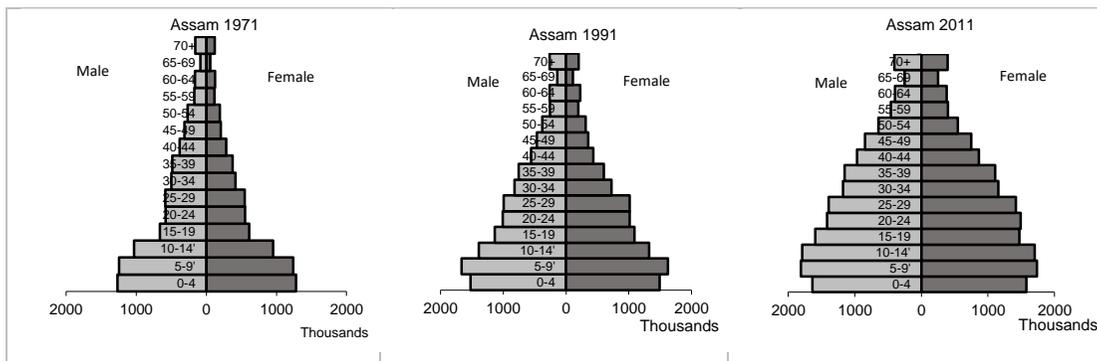


Figure 7

Age Pyramid of States in the North-Eastern region



Source: Census 1971-2011

Age Structural Transition in the Major States of India

Madhya Pradesh and Uttar Pradesh are situated in the central part of the country. These states are still lagging behind the other states in benefiting from windows of opportunity. Regarding the increasing share of the middle-aged population, the age pyramids of Maharashtra and Gujarat show the benefits of demographic bonuses since 2011.

Bihar, Odisha, and West Bengal are the states in the eastern region of the country. Age pyramid of Bihar from 1971 to 2011 indicates an increase in the proportion of children in the (5-9) age group. The older population is deficient in this region. West Bengal, Orissa and Madhya Pradesh are experiencing a sharp increase in the youth (15-59) from 1971 to 2011. In Punjab and Haryana, the proportion of old age groups is expanding due to the rise in the share of the middle-aged

population.

The shape of the age pyramid in West Bengal changed from conical in 1991 to rectangular in 2011. In Rajasthan, the child population decreased gradually from 1971 to 2011. The conical shape of age pyramids has been maintained in Rajasthan over the decades because older cohorts were invariably smaller than younger cohorts. Rajasthan seems to take longer to realise the benefits of demographic bonuses than other states, particularly the southern states. All the states in India under consideration are experiencing a sharp increase in the old (60+) population from 1971 to 2011. Due to declining fertility, the proportion of children aged 0-14 would decrease across all Indian states. Compared with the southern states, the northern states have the highest share of children. Many Indian states still have a high proportion of young population, and in some of these states, this demographic trend is expected to persist and even increase over the next two decades. Upon analysing the age pyramids of major states, it is evident that the age

structural transition differs from region to region.

Dependency Ratio

The dependency ratio, expressed as a percentage of the population in the dependent age group to the working-age population, serves as another indicator for analysing the age structure of the population. The dependency ratio for India and the states concerned are discussed below.

The dependency ratio declined in India from 1971 to 2011. In 1971, more than 92 per cent of the total population in India was dependent on the young population, but in 2011, it was only 65 per cent, a decline of 29 per cent during the period. The old-age dependency ratio increased by 22 per cent from 1971 to 2011. The young-age dependency ratio declined from 81 per cent to 51 per cent during the same period, a nearly 37 per cent decline. Similarly, the dependency ratio in major states declined from 1971 to 2011, particularly the young dependency ratio across all four southern states.

Table 1

Dependency Ratio of India and Major States from 1971 to 2011

States	1971			1981			1991			2001			2011		
	Total	Young	Old												
India	92.3	80.8	11.6	85.3	73.3	12.0	79.3	67.2	12.1	75.1	62.0	13.0	65.2	51.0	14.2
Kerala	86.8	75.2	11.6	73.8	60.7	13.0	62.9	48.5	14.4	57.6	41.1	16.5	56.3	36.6	19.3
Andra Pradesh	88.1	76.1	11.9	82.5	70.4	12.1	74.8	62.9	11.8	65.7	53.1	12.6	55.9	40.5	15.4
Tamil Nadu	79.3	66.9	12.4	70.0	59.1	10.8	62.2	50.1	12.1	55.8	42.0	13.8	51.5	35.7	15.7
Karnataka	94.3	82.4	11.8	85.6	73.5	12.1	76.1	63.7	12.3	65.5	52.8	12.7	55.6	40.8	14.7
Madhya Pradesh	97.8	86.5	11.2	99.2	79.1	20.1	93.4	74.4	19.0	84.2	71.1	13.1	71.5	57.1	14.3
Uttar Pradesh	94.7	81.5	13.2	94.3	81.1	13.2	93.1	80.1	12.9	92.8	79.2	13.5	77.6	63.8	13.8
Bihar	94.1	82.7	11.4	94.3	81.1	13.2	92.1	80.1	11.9	95.3	82.1	13.1	89.7	75.5	14.2
Orissa	93.7	81.9	11.8	86.0	74.2	11.8	81.1	68.1	12.9	71.0	56.8	14.2	62.4	46.8	15.6
West Bengal	93.3	83.0	10.2	79.7	69.9	9.8	82.0	71.1	10.9	67.7	55.7	11.9	55.2	41.9	13.2
Punjab	93.9	79.6	14.3	81.0	66.9	14.1	74.3	60.6	13.7	68.1	52.8	15.2	56.0	39.9	16.1
Rajasthan	98.8	87.8	10.9	94.1	82.5	11.6	89.9	77.9	11.9	88.3	75.5	12.7	73.1	60.1	12.9
Haryana	108.3	96.2	12.0	92.4	80.3	12.1	88.6	74.1	14.5	77.1	63.8	13.2	62.3	48.2	14.0
Gujarat	93.6	83.3	10.2	80.8	70.1	10.6	73.0	61.9	11.0	65.9	54.4	11.4	58.5	45.9	12.5
Maharashtra	89.0	78.2	10.7	80.8	69.2	11.5	74.8	62.5	12.2	69.0	54.3	14.6	57.8	42.1	15.6
Assam	106.6	93.0	9.4	*	*	*	84.2	74.4	9.9	76.4	66.0	10.3	65.4	54.3	11.0

*Census was not conducted in Assam due to insurgency

Source: Author's calculation using census data

The old age dependency ratio increased from 1971 to 2011 in all states. Until 2001, Andhra Pradesh had the highest total and young dependency ratios. However, by 2011, Kerala had the highest dependency ratio. The dependency ratio was lowest in Tamil Nadu in 2001, and the decline in the ratio since 1971 was the least in this state. The largest decline in the dependency ratio from 1971 to 2011 was in Kerala. In Kerala, the old-age dependency ratio increased continuously from 1971 to 2011, indicating an ageing population. In Madhya Pradesh and Uttar Pradesh, the young dependency ratio declined from 1971 to 2011. The total dependency ratio and the young dependency ratio are continuously declining in the Eastern states over the entire period. In Bihar, the overall dependency ratio and the young dependency ratio were highest throughout the period. In these states, old-age dependency has shown a consistent decline from 1971 to 2001, with an increase in 2011. The old dependency ratio is high in Maharashtra, while the young dependency ratio is high in Gujarat. Assam had the highest total dependency ratio in 1971 (106.6); the dependency ratio declined from 1971 to 2001, particularly in the young dependency ratio. Analyses reveal that the total and young dependency ratios in northern states have consistently declined throughout the period.

Workforce Participation Rate

India's workforce participation rate (WPR) has slightly increased over the

last five decades. In 1971, only 34.2% of the total economically active population was engaged in work, while this figure rose to 39.7% by 2011. WPR for males marginally increased from 51.5 % in 1991 to 53.2 % in 2011; for females, it improved slightly from 22.2 % to 25.5 % during the same period. The largest increase in WPR took place in Karnataka; WPR is lowest in Kerala for both males and females. Rajasthan noted the highest WPR among northern states (1971-2011). Haryana improved the WPR from 26.4 in 1971 to 39.8 in 2001; after that, a slight decrease in WPR was observed in 2011(35.1 %). WPR in western states showed that female WPR is higher in Maharashtra than in Gujarat. Table 2 shows that the percentage of workers in India increased significantly between 1971 and 2011. Additionally, the rates of male and female work participation differ significantly over the period in India. The percentage change in workforce participation shows a 6% increase from 1991 to 2011 in India. There is no promising trend in the overall work participation in India and the states.

Supporting Ratio

The supporting ratio is similar to the Age Dependency Ratio, but in the supporting ratio, the population in the age group 25-59, rather than 15-59, is considered in the numerator. This is because most youths will be employed only after turning 25.

Table 2
Work Participation Rate in India and Major States From 1971–2011

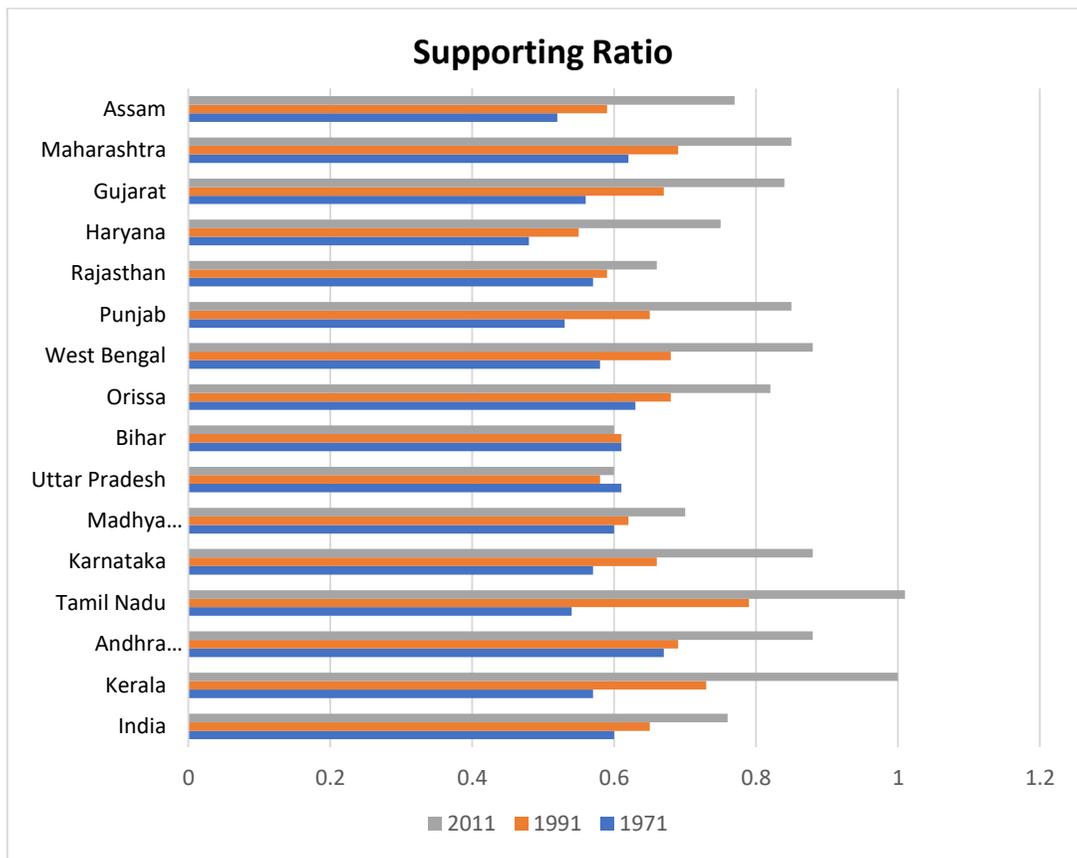
States	1971			1981			1991			2001			2011		
	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F
India	34.2	52.8	14.2	36.7	52.6	19.0	37.4	51.5	22.2	39.1	51.6	25.6	39.7	53.2	25.5
Kerala	29.1	45.0	13.5	30.5	44.8	16.6	31.4	47.5	15.8	32.2	50.2	15.3	34.7	52.7	18.2
Andhra Pradesh	41.4	58.2	24.2	45.7	57.7	33.5	45.0	55.4	34.3	45.7	56.2	35.1	46.6	56.9	36.1
Tamil Nadu	35.8	56.0	15.1	41.7	56.5	26.5	43.3	56.3	29.8	44.6	57.6	31.5	45.5	59.3	31.7
Karnataka	34.7	54.4	14.2	40.2	54.5	25.3	41.9	54.0	29.3	44.5	56.6	31.9	45.6	58.9	31.8
Madhya Pradesh	36.7	53.7	18.6	38.5	53.5	22.3	42.8	52.2	32.6	42.7	51.5	33.2	43.4	53.5	32.6
Uttar Pradesh	30.9	52.2	6.7	29.2	50.3	5.4	32.2	49.6	12.3	32.4	46.8	16.5	32.9	47.7	16.7
Bihar	31.0	52.2	8.9	29.7	49.2	9.1	32.1	47.9	14.8	33.7	47.3	18.8	33.3	46.4	19.0
Orissa	30.4	46.2	7.3	32.7	54.4	10.7	37.5	53.7	20.7	38.7	52.5	24.6	41.7	56.1	27.1
West Bengal	28.0	48.8	4.4	28.3	48.7	5.8	32.1	51.3	11.2	36.7	53.9	18.3	38.0	57.0	18.0
Punjab	28.9	52.8	1.2	29.3	53.1	2.3	30.8	54.2	4.4	37.4	53.6	19.0	35.6	55.1	13.9
Rajasthan	31.2	52.1	8.3	30.4	49.9	9.3	38.8	49.3	27.4	42.0	49.9	33.4	43.5	51.4	35.1
Haryana	26.4	47.2	2.4	28.3	48.9	4.7	30.9	48.5	10.7	39.6	50.2	27.2	35.1	50.4	17.7
Gujarat	31.4	51.2	10.3	32.2	52.2	11.0	40.2	53.5	25.9	41.9	54.8	27.9	40.9	57.1	23.3
Maharashtra	36.5	52.1	19.7	38.7	52.5	23.4	42.9	52.1	33.1	42.4	53.2	30.8	43.9	56.0	31.0
Assam	28.4	48.8	4.7	*	*	*	36.0	49.4	21.6	35.7	49.8	20.7	38.3	53.5	22.4

*Census was not conducted in Assam due to insurgency

Note: WPR: Work participation rate; T: Total; M: Male; F: Female

Source: Author's calculations using census data

Figure 8
Supporting Ratio for India and Major States



Source: Census 1971–2011

Table 3
Supporting Ratio for Major States

Supporting Ratio					
Year	1971	1981	1991	2001	2011
India	0.60	0.60	0.65	0.68	0.76
Southern states					
Andhra Pradesh	0.67	0.63	0.69	0.76	0.88
Karnataka	0.57	0.59	0.66	0.75	0.88
Tamil Nadu	0.54	0.71	0.79	0.88	1.01
Kerala	0.57	0.60	0.73	0.87	1.00
Central states					
Madhya Pradesh	0.60	0.58	0.62	0.62	0.70
Uttar Pradesh	0.61	0.58	0.58	0.56	0.60
Eastern states					
Bihar	0.61	0.59	0.61	0.58	0.60
Orissa	0.63	0.61	0.68	0.73	0.82
West Bengal	0.58	0.61	0.68	0.76	0.88
Northern states					
Punjab	0.53	0.57	0.65	0.71	0.85
Rajasthan	0.57	0.55	0.59	0.58	0.66
Haryana	0.48	0.50	0.55	0.63	0.75
Western states					
Gujarat	0.56	0.59	0.67	0.74	0.84
Maharashtra	0.62	0.64	0.69	0.73	0.85
North Eastern states					
Assam	0.52	NA	0.59	0.67	0.77

Source: Author's calculations using census data

In India, the supporting ratio gradually increased from 1971 to 2011, rising from about 0.60 in 1971 to about 0.76 in 2011. The support ratio was comparatively high in most southern states, especially in Kerala and Tamil Nadu, which had the highest value, and exceeded 1 in 2011, indicating that the states have begun to experience the demographic dividend. The other two states in the southern region, Andhra Pradesh and Karnataka, will achieve the demographic dividend in the very near future. The gradual rise in the support ratio in Madhya Pradesh and Uttar Pradesh is occurring at a slower pace compared to other states, causing these states to lag in achieving the demographic windows of opportunity. Among the eastern states, Bihar exhibits a fluctuating trend in support

ratio from 1971 to 2011. On the other hand, Orissa and West Bengal have consistently increased support ratios over the same period. In Punjab, Haryana and Rajasthan, supporting ratios have been rising over the decades. Similarly, most of the states in the western and northeastern regions show an increasing trend in the support ratio.

Per Capita Income and Demographic Dividend

Here, the concept of a demographic dividend is explained using a basic equation, with GDP per capita used as the measure of economic growth. First, GDP per capita is decomposed in the following equation.

$$Y/N = (L/N) * (Y/L)$$

In this equation, Y denotes GDP, N

denotes population, and L denotes the labour force. Then, GDP per capita is expressed as the product of the support ratio (L/N) and labour productivity. Equation can be rewritten in growth terms as follows

$$\text{gr}(Y/N) = \text{gr}(L/N) + \text{gr}(Y/L)$$

Table 4

GDP as the Sum of the Growth Rate of Support Ratio and Labour Productivity

<i>GDP as the sum of the growth rate of support ratio and labour productivity</i> <i>Productivity gr(Y/N) = gr(L/N) + gr(Y/L)</i> 1991-2011		
<i>States</i>	<i>gr(Y/N)</i>	<i>gr(L/N) + gr(Y/L)</i>
India	1.59	1.37
Kerala	0.2654	0.2192
Andhra Pradesh	0.1163	0.1048
Tamil Nadu	0.2186	0.1980
Karnataka	0.1779	0.1577
Madhya Pradesh	0.1262	0.1091
Uttar Pradesh	0.1009	0.0866
Bihar	0.0884	0.0715
Orissa	0.1761	0.1314
West Bengal	0.1338	0.0973
Punjab	0.1198	0.0975
Rajasthan	0.1453	0.1158
Haryana	0.1634	0.1323
Gujarat	0.2051	0.1930
Maharashtra	0.1679	0.1573
Assam	0.1299	0.1089

Source: Author's calculations using census and GDP

Table (4) illustrates the relationship between GDP and economic growth; the GDP growth rate is calculated as the sum of the support ratio and labour productivity. It implies that increases in labour force participation and productivity played an essential role in generating

economic growth. The GDP growth rate in India and its states (1991 to 2011) is approximately equal to the sum of their growth rates in support ratio and labour productivity. As a result, the relationship between GDP growth and labour productivity indicates that the demographic dividend contributed positively to economic growth.

Summary and Conclusion

Age structural transition is a fundamental component of demographic transition, and it can be effectively visualised through the age pyramid, which provides a comprehensive representation of the age-sex composition of the population. Age pyramids of India showed a clear shrinking at young ages from 2001 due to the recent fall in fertility. The proportion of children in the population has decreased, while the percentage of adults and the elderly has increased, indicating a shift in the demographic profile towards middle age. The transition of population to the Middle Ages surely reduces the dependency ratio, and it is hopeful for a better reaping of the window of opportunity. In the near future, India will be the largest contributor of the working-age population due to the achievement of a window of opportunity. All the southern states have experienced a decline in the younger age cohort (0-14) and a gain in the economically active population. Among the states, the decline in the young population was highest in Kerala. According to the pyramid,

Kerala experienced ageing in 2011. The elderly female population is higher than the elderly male population. Madhya Pradesh, Uttar Pradesh, and Rajasthan are still lagging behind the other states in benefiting from windows of opportunity. In Punjab and Haryana, the proportion of old age groups is expanding due to the increasing share of the middle-aged population. Age pyramids of Maharashtra and Gujarat show an achievement of demographic bonus since 2011. Ageing populations are expected to affect social security and healthcare delivery in Kerala, Tamil Nadu, Punjab, and Karnataka. To effectively address the challenges of population ageing, India must implement comprehensive, long-term health and social security policies.

The dependency ratio is another indicator for analysing changes in a population's age structure. The dependency ratio declined from 1971 to 2011, particularly the young dependency ratio across all four southern states. The largest decline in the dependency ratio from 1971 to 2011 was in Kerala, which experienced a tremendous increase in old-age dependency during the same period. Among the central states, the supporting ratio has increased from 1971 to 2011. The southern states show the greatest increase in the level of the supporting ratio from 1971 to 2011; Kerala and Tamil Nadu crossed the level of supporting ratio, and it is more

than one in 2011, indicating that the states have started the demographic dividend. The relationship between GDP per capita, support ratio and labour productivity revealed that the demographic dividend had a positive impact on economic growth. There is an upward trend in India's overall GDP and that of its states. The analysis of total workers in India shows that the work participation rate has increased continuously over the last five decades; there is a considerable difference in the work participation rates of males and females. It can be observed that the participation rate first declines in the lower age groups, then increases in the prime age group, and finally declines in the older age group. Changes in workforce participation rates indicate that in the coming decades, the working-age population (15-59) will increase significantly, leading to a rise in labour supply. The age structural transition in India significantly influences the composition and functioning of the workforce. To sum up, governments should focus on building human capital through targeted investments in education, employment, healthcare, and nutrition to reap the benefits of the window of opportunity provided by age-structural transitions. The age structural transition indicates the necessity of considering the population profile in various planning and policy formulation in India and its states.

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