

Demographic Dividend and Optimum Population in Indian Context: Issues and Prognoses

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Abstract- This paper examined the issues of India's demographic dividend on a socio-economic spectrum. . India, with more than 65% of the population below the age of 35, India will rise as an economic super power, supplying more than half of Asia's potential workforce over the coming decade. By the 2030, the increase in women workforce would boost the overall size of the Indian economy by around one sixth, or the equivalent of close to US\$2 trillion a year in terms of today's purchasing power. IMF says, India's continuing dividend could add about 2% to the annual rate of growth, if harnessed properly. Besides, this paper discussed optimum population and advantages at the point of optimum population in Indian context. It also analysed the 'potential end targets' meaning of optimum population. The potential end targets of optimum population: 'an optimum population is that the earth can support sustainability and so on'. The Global Footprint Network has developed the concepts of biocapacity and ecological footprint.

KEYWORDS: Ageing Population, Biocapacity, Demographic Dividend, Dependency Ratio, Ecological Footprint, Gen Z, Optimum Population

INTRODUCTION

Population ageing is a global phenomenon. Demographic dividend can be a boon or can stymie the economic growth. Optimum population is a dynamic concept, it can change with exploration of new resources, improvement in technology and the ability of the resources to use the natural resources sustainably. Ageing is a blessing. There's this idea that old age is good. The elderly persons pass on family traits and history and wisdom to their grand children and help them to enhance their sense of humour; give emotional support to them; and are very influential in their lives. Ageing is a triumph of development. This is this the fact that old age is a testimony of medical advancement as people's life expectancy rise dramatically because of improvement in public health, nutrition, sanitation, education and economic well-being. Ageing is an economic burden. Lower the proportion of young persons in the population of a country, smaller the work force, and, thus, less is the economic potential. The UN defines a country as "Ageing" or "Greying Nation" where the proportion of people over 60 reaches 7% to total population. By 2011 India has exceeded that proportion (8.0%) and is expected to reach 12.6% in 2025. However, the real game changer for India is its demographic dividend and it goes hand in hand with the challenges to reach the point of optimum population.

INDIA DEMOGRAPHIC PROFILE 2018

India occupies 2.41% of the world's land area; is the second most populated country in the world with nearly a fifth of the world's population (1210.9 million according to 2011 census). The Indian population reached the billion mark in 1998. During 1975–2019 the population doubled to 1.2 billion. India is projected to be the world's most populous country by 2024, surpassing the population of China. It is expected to become the first political entity in history to be home to more than 1.5 billion people by 2030, and its population is set to reach 1.7 billion by 2050. Its population growth rate is 1.2%, ranking 94th in the world in 2013. India has more than 50% of its population below the age of 25 and more than 65% below the age of 35. It is expected that, in 2020, the average age of an Indian will be 29 years, compared to 37 for China and 48 for Japan; and, by 2030, India's dependency ratio should be just over 0.4.

Table 1.1 India Demographics Profile 2018

Population	1,281,935,11 (July 2017 est.)
Age structure	0-14 Years: 27.34% (male 18608,665/female 164,38,204) 15-24 years: 17.9% (male 121,89,86/female 10,583,437) 25-54 years: 41.08% (male 2,44,09/female 254,834,569) 55-64 years: 7.45% (male 4,846,122/female 4,632,532) 66 years and over: 6.24% (male 37,837,801/female 42,091,086) (2017 est.)

Dependency ratios	total dependency ratio: 52.2 youth dependency ratio: 43.6 elderly dependency ratio: 8.6 potential support ratio: 11.7 (2015 est.)
Median age	total: 27.9 years male: 27.2 years female: 28.6 years (2017 est.)
Population growth rate	1.17% (201 est.)
Birth rate	19 births/1,000 population (2017 est.)
Death rate	7.3 deaths/1,000 population (2017 est.)
Sex ratio	at birth: 1.12 male(s)/female 01-14 years: 1.13 male(s)/female 15-24 years: 1.13 male(s)/female 25-54 years: 1.06 male(s)/female 55-64 years: 1.01 male(s)/female 65 years and over: 0.9 male(s)/female total population: 1.08 male(s)/female (2016 est.)
Infant mortality rate	total: 39.1 deaths/1,000 live births male: 3 deaths /1,000 live births female: 40.4 deaths/1,000 live births (2017 est.)
Life expectancy at birth	total population: 68.8 years male: 67: 6 years female: 70.1 years (2017 est.)
Total fertility rate	2.43 children born/woman (2017 est.)
Literacy	definition: age 15 and over can read and write total population: 71.2% male: 81.3% female: 60.6% (2015 est.)
School life expectancy (primary to tertiary education)	total: 12 years male: 12 years female: 12 years (2014)
Education expenditures	3.8% of GDP (2013)
Maternal mortality rate	174 deaths/100,000 live births (2015 est.)
Children under the age of 5 years underweight	35.7% (2015)
Health expenditures	4.7% of GDP (2014)

Source: CIA World Fact book

Dependency Ratio in India

Dependent population who are not in the labour force is the inter/national feeling of doom and gloom. As people move towards old age they lose their vitality, mental sharpness and looks, and turned into dependent population. So, all things considered, ageing poses socio and economic challenges. Dependent population age is based on a de facto definition, globally it is 64 and over.

The dependency ratio is an age-population ratio of those who are ages 0 to 14 and over 64 . The productive part ages 15 to 64 are computed in the labour force. In economics, the dependency ratio is used to measure the pressure on the productive population. It is the lack of income potential that generally qualifies those under 15 and over 64 as dependent

as it is often necessary for them to receive outside support to meet their needs. Dependent population is part of the total population that are not productive and does rely on others for the goods and services they consume. Any individual before the age of 15 is unlikely to receive any personal income according to the country's regulation. For a person, it is generally considered over 64 years of age as the retirement age and hence they are not to be part of labour force.

The dependency ratio =

$$\frac{\text{Number of persons in age group 0-14 years} + \text{Number of persons in age group 64 years and over}}{\text{Number of working population aged 15-64}} \times 100$$

Table 1.2 Percentage of Population in selected age groups in India: 1991 to 2011

Age group (years lbd)	Census 1991*	Census 2001@	Census 2011@
0-4	12.2	10.7	9.3
5-9	13.3	12.5	10.5
10-14	11.8	12.1	11.0
15-59	55.4	56.9	60.3
60+	6.8	7.4	8.6
Age not stated	0.6	0.3	0.4

Source: Census of India 2011

*excluding Jammu & Kashmir; @ excluding Mao Maram, Pao Mata and Purul Sub Divisions of Senapati district of Manipur
Dependency Ratio can be divided in 2 parts: a) young dependency ratio b) old dependency ratio.

Dependency ratio remains high because of: ageing population, low birth rate, high life expectancy, and low death rate. High dependency ratio always involves high opportunity cost on the intellectual productivity and the labour productivity of the younger population. Since the spending on dependent population on health care and social security benefits absorbs a larger portion of government expenditure that is a cause for concern in the country's economic growth. A faster rise in dependency ratio that of with global average could affect the economy's international competitiveness.

Reduction in dependency ratio indicates a phase of population transition where a higher percentage of persons in the working age group may translate into higher per capita income for the economy. This economic benefit enjoys by the country due to a change in age structure/ less dependency

population is called 'Demographic Dividend'. In simple words, the share of working population is larger than the share of non-working population. This occurrence puts less economic strain on families with more economically active persons. In 2015, total dependency ratio (0-14 and 65+ per 100 population 15-64) for India was 52.2 ratio.

Dismal Development Indicators

India's development indicators are gloomy. HDI ranking for 2016 is 131. India's life expectancy at birth is 68 years. This is an indicative of state of poor health and hygienic facilities. India's GNP per capita(PPPUS\$ 5663) is also low and below the south Asian average. India's expected years of schooling are just 11.7 whereas mean years of schooling are as low as 6.3 years. These factors are important to develop a health and a productive workforce. A workforce that is unhealthy, ill-fed, and does not have enough training and education cannot be a resource for its economy.

Demographic dividend in India: getting younger and richer

Demographic dividend, as defined by the United Nations Population Fund (UNFPA) means, "the economic growth potential that can result from shifts in a population's age structure, mainly when the share of the working-age population (15 to 64) is larger than the non-working-age share of the population (14 and younger, and 65 and older). Demographic dividend is the resultant of decline in fertility(healthier women) and child mortality rates. It is not in other words, fewer older dependent population because of shorter life expectancies also amount to demographic dividend.

Demography is the fundamental driver of all the economies. Demographic changes the balance of power and economics in Asia, in particular, India will be new main actor and reap the dividends of its demographic potential . With more than 65% of the population below the age of 35, India will rise as an economic superpower, supplying more than half of Asia's potential workforce over the coming decade. India has a median population age of 27.3 years compared to that of 35 years for China and around 47 years for Japan. (The median marks the point where half the population is older than that age and half is younger). India's burgeoning population of millennials, is around 390 million and Gen Z cohort of 440 million and about 12 million people are added to working age population every year.

Female work force participation in India

India has the 16th lowest rate of female workforce participation in the world. India's female workforce participation rates remain at 27 %. By the 2030s, it will

gradually rise to 49%, but the cohort is equal to Japan's current position.

Though women tend to receive lower wages than men in India, the increase in women workforce would boost the overall size of the Indian economy by around one -sixth, or the equivalent of close to US\$2 trillion a year in terms of today's purchasing power.

Implications of demographic dividend on economic growth According The Sample Registration Survey of India (SRS) statistical report, India's youth population is about 64.4% (a sufficient proxy for the potential labour force), of its total population between the ages of 15 and 59 years in 2015- .The future demographic dividend of the country, the population between the ages between 0 and 14 years made up 27.3% of the total population, while 8.3% of the total population were above the age of 60 years.

Urban and rural areas had more or less similar composition. The urban youth population share was 67.7%, that is slightly higher than the rural:62.9%.

Demographic growth is significant as it is intrinsically linked to economic growth. There are both virtuous and vicious circle in play due to upswing demographic pendulum. The increase in percentage of working age population, increases the labour supply of the country. Young skilled and healthy labours have the potential to boost all the three blocks of economic potential at the same time: population, participation and productivity. In order to reap the economic benefits of the productive potential of the labour pool in the labour supply, the economy has to address many challenges such as huge investment in education, health and security, employment generation and social security and tightening public sector budgets. Failing to do so, we can expect there to be additional cost to the society, welfare models will be pushed to the limit, rise in unemployment, loss of income, negative multiplier effect, social dislocations/upheavals like increase in crime, increase in divorce rate, worsening of health and lower life expectancy, and budget deficit. At the same time, an expectation of continuing good growth will result in pricy real estates and stock markets.

In case of India, the working population in India is set to rise considerably over the next decade or more. By 2030, India's median age population will be 31.2, while China will be 42.5 years. As the working age population in the major economies decline, more jobs will be outsourced to India. According to Indian Monetary Fund(IMF), India's continuing dividend could add about 2% to the annual rate of growth, if harnessed properly. In HDI ranking, India is

still in the 'medium' category. The vast majority of the Indian labours are not equipped themselves in the modern set up of work, especially blue collar functions like assembly-line work. Countries like Philippines are eating into India's back-end services jobs.

To address the problems, Skill India campaign is launched by the Indian Prime Minister Narendra Modi on 15 July 2015 that aims to train 40 crore Indians in different skills by 2022. It includes various initiatives with the likes of "National Skill Development Mission", "National Policy for Skill Development and Entrepreneur, 2015", "Pradhan Mantri Kaushal Vikas Yoyana and the "Skill Loan Scheme" .

Additionally, to make the Indian workforce efficient and skilled, government of India established National Skill Development Corporation(NSDC) in 2009 as a not-for-profit company set up by the Ministry of Finance. NSDC will contribute significantly (about 30%) to over all target of skilling/ up skilling 500 million people in India by 2022, mainly by fostering private sector initiatives in skill development programmes and providing funding.

The decline in numbers of dependents boosts the individual and national savings. Higher savings accumulates higher capital formation. The improvement in technical knowledge helps with the economies of scale production by increasing specialisation and higher productivity, is the vehicle for acceleration in economic growth. Generally, economic theory states, for economic development to occur the required savings rate needs to be 22 to 25%. Indranil Sengupta, chief economist, Bank of America Merrill Lynch, says, demographic dividend will support 30-35% of GDP savings and investment rates. The credit - to GDP is going to be double to over 80% of the GDP and the resulting benefit is lower lending rates.

Demographic dividend encourages human capital. A child having less/no siblings will have the benefit to enjoy the high quality education and better health care services. This is because the affordability of the parents is high as they have fewer economic pressures at home. The Total Fertility Rate(TFR) in India is 2.45(2016 estimated). The TFR (total number of children born per women) by religion in 2005-2006 was: Hindus -2.7; Muslims-3.1; Christians- 2.4; and Sikhs-2.0.

Demographics drive demand- the decline in dependency ratio increases GDP per capita that encourages consumers domestic demand. Due to the emergence of mass market, an entry-level car that costs 14 times India's per capita income say 10-15 years ago, today costs only two-and-a-half times.

Optimum Population

"Excessive(Population) growth may reduce output per worker, repress levels of living for the masses and engender strife"- Confucius

Any sustainable society requires an optimum population to bring about the fruition of chosen goals of equity and efficiency. Edwin Cannan and Carr Saunders are the founders of the optimum population theory, states that the growth of the population measures by the total volume of output instead of available/accumulation of food stock. In their words, optimum population is the size and structure of the population that maximises the output per head(per capita income) of the economy. This is a way to define the 'single end targets' of optimum population. So it is the useful way to measure the improvement of the wealth and welfare of the society. At the point of maximum returns, if the actual population outstrips or falls short of the optimum, then the disequilibrium between them would 'diminish proportionate returns' to labour.

Advantages gained at the point of Optimum Population

- a) effective management of resources through optimum utilisation of resources, resulting higher standard of living.
- b) enhances participation in resource development of the country.
- c) economic stability occurs as there prevails full employment and equitable distribution of resources-returns per head is maximised.
- d) the state may set a target of reducing green house gas emissions.

Optimum Population in Indian Context

As per the 'First Advance Estimates of National Income, 2016-17' released by the Central Statistics Office(CSO), the per capita net national income during 2016-17 is estimated to be Rs1,03,007 at current prices.

It is estimated that 290 million Indians live below the International poverty line of \$1.25. These populations bear the brunt of problems caused by bringing sustainability. 70% of the population uses stoves that burn firewood and dung. These stoves release smoke into Indian homes contributing to greenhouse gas pollution and putting the villagers at risk of diseases including lung cancer and pneumonia.

Another way to define the optimum population is 'potential end targets', meaning that :a) " an optimum population is that the earth can support sustainability(carrying capacity), allowing people to enjoy the good quality of life b) efficient operation of democracy, finalising the outcomes based on the majority that includes protection for personal freedom and c) preservation of bio-diversity.

The carrying capacity means that the population that can be supported forever by an ecosystem without destroying that ecosystem. The Global Footprint Network (GFN) has developed the concepts of biocapacity and ecological footprint. The Ecological Footprint is the only metric that measures how much nature we have and how much nature we use. The Footprint helps countries improve sustainability and well-being, local leaders optimise public project investment and individuals understand their impact on the planet.

The ecological footprint tracks the use of 6 categories of productive areas such as cropland, grazing land, fishing grounds, built-up land, forest area, and carbon demand on land. It is measured in global hectares(gha), and global hectares per capita(gha/pc). A global hectare quantifies the biocapacity and measures the average productivity of all biologically productive areas in a given year. A global hectare per capita refers to the amount of biologically productive land and water consumed per person.

On the demand side, the ecological measures the ecological assets that a given population consumes for their needs and wants from a given natural resources and the absorption of carbon dioxide from the fossil fuel use. The human consumption includes plant-based food and fiber products, livestock and fish products, timber and other products, space for urban infrastructure. Ecological assets are becoming the decisive competitive element in global phenomenon.

On the supply side, a city, state or nation's biocapacity represents the productivity of its ecological assets(including cropland, grazing land, forest land, fishing grounds, and built-up land). The areas that are not harvested can absorb more waste materials we generate, especially carbon emissions. Ecological Footprint is compared to its biocapacity of the city/state/nation. They are expressed in global hectares- globally comparable, standardised hectares with world's average productivity.

Ecological deficit occurs when a region's demand for the goods and services from its land and seas, including carbon absorption exceeds what that region's ecosystem can renew by itself. Not in other words, the region liquidates its own ecological assets by deforestation, overfishing, and emitting carbon dioxide into the atmosphere. In simple words, ecological footprint exceeds region's biocapacity.

Whereas, if a region's biocapacity exceeds its ecological footprint, then the region is said to have ecological reserve.

Ecological Footprint Per Capita

The Ecological Footprint percapita is a nation's total Ecological Footprint divided by the total population of the

nation. To live within the means of our planet's resources, the World's Ecological Footprint must have to equal the available biocapacity per person on our planet, which is currently 1.7 global hectares(GHA). So if a nation's Ecological Footprint percapita is 6.8 GHA, its citizens are demanding 4 times the resources and wastes that our planet can regenerate and absorb in the atmosphere.

The average India has an ecological footprint of 1.1 gha/pc. This is slightly less than eight times lighter than Americans(8.6 gha/pc) , and over one and a half times lighter than the global footprint(1.7 gha/pc).

It is IBSCR(not BRICS) nations as for ecological footprint of gha/pc., India has the lightest global Foot print of 1.1 gha/pc, next comes Brazil at 3.0 gha/pc, followed by South Africa at 3.4 gha/pc and China (3.6 gha/pc) placed above wooden spoon performer Russia(5.7gha/pc).

Second populous country of the world India has been ranked the 3rd heavier ecological foot print, that stands at 1,360,000,000(in global hectares). China stands first at 5,010,000,000 followed by United states at 2,720,000,000. Russia(820,000,000) and Brazil (616,000,000)in four and six place respectively. Though the ecological footprint is on the heavier side, ecological footprint in global hectares per capita is lighter, meaning that India amounts less threaten to global sustainability. It is because the culture of vegetarianism has a less impact on environment and less green house emission. Meat, cheese and eggs have the highest carbon footprint. A meat lover has the highest carbon footprint at 3.3 tons of greenhouse gas emissions. A vegan diet has the lowest carbon footprint at just CO₂e(Carbon Dioxide equivalent). Reducing the footprint by a quarter just by cutting down on red meats such as beef and lamb. Not in other words, it is 63 miles of driving produces the same emissions as eating 1 kilogram of beef. Secondly, in the extended/joint family system there is common kitchen. Thirdly, the access to various forms of transportation proximity from home to work and other amenities are effectively in place.

BIOCAPACITY PER CAPITA

Biocapacity per capita equals total biocapacity of a region divided by the region's population. The average biocapacity per person for the entire world is 1.7 global hectares. Countries with an average biocapacity of 3.4 global hectares per person have twice as many resources as the world average.

Table 1.3 India's Ecological Footprint and its Biocapacity

Ecological Footprint Per Capita	Biocapacity Per Capita	Biocapacity Credit(+)/Deficit (-)
1.1 GHA*	0.4 GHA*	-0.7 GHA*

*2013 Population 1,279,498,880

GDP PerCapita \$1,555

GDP Per Capita is in constant 2010USD

Table 1.4 BRICS nations biocapacity deficit and biocapacity reserves

Countries with Biocapacity deficit in % (biocapacity debtors)		Countries with Biocapacity reserve in % (biocapacity creditors)
China	288%	Brazil 193%
South Africa	204%	Russia 20%
India	144%	

Source:Global Footprint Network

Suggestions:

- 1) By large-scale and sustained long-term investment in infrastructure and energy, the capital and labour surplus will be absorbed . Deployment of capital inflow into infrastructure, energy, water management will in turn encourage service industries sustainably.
- 2) By a becoming global manufacturing hub and to create a culture of manufacturing, India must ease the onerous regulations and policy on taxation and customs so as to import cheaper things like medical equipment rather than manufacture it domestically. In turn, demographic dividend finds meaningful employment.
- 3) The costs of running a supply chain, including procurement, inbound warehousing, storage, outbound warehousing, distribution, after sales and reverse logistics (simply logistical costs) is nearly about 14% of GDP. The capital expenditure on cold chain development, will eliminate wastages and cut down the cost in agriculture and food industry to meet the enhanced demand of the growing population.

CONCLUSION

India's Total Fertility Rate (TFR1) is 2.2, according to the recently released National Family Health Survey (NFHS-4 :2015-16) report. Such low fertility rates indicate that India is entering the final stage of demographic transition. "Replacement level fertility" is 2.1 (for most countries) that is essential for population stabilisation, which India is poised

to achieve before 2020, more than 20 years ahead of the United Nations predictions (2011). Politicians have been optimistic about the country's potential to reap this demographic dividend, but demographers and economists have warned that the dividend can be realised only when right policies for education and skilling, and good governance are in place.

We are living on the natural 'capital' of the earth planet rather than its renewable income.

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