International Journal of Policy Sciences and Law
ISSN: 2582-9203

IJPSL

Volume 2, Issue 2

Demographic Transition and Economic Development: Causal Relationships and a Review of India's State of Affairs

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International Journal of Policy Sciences and Law
ISSN: 2582-9203

Abstract

Demographic composition of a country has far-reaching implications on its economic and social growth, spanning decades. To achieve the developmental targets of a country, it is imperative to understand these causal relationships, both at the macro and micro level and their effects on the policymaking process. The paper attempts to highlight the direct and indirect relationships between economic development and population growth and structure and identify the direction(s) of this correlation. Further, it also attempts to present a review and analysis of India's position and its preparedness in terms of the stages provided in the Theory of Demographic Transition proposed, the measures and safeguards in place that can help the country utilize the demographic dividend, and further suggest possible actions that the governments can take to get hold of the overpopulation problem.

Keywords: *population, economy, birth rate, death rate, fertility, transition*

1.0 Introduction

In 2019, the United Nations projected the global population to be about 7,795 million or 7.79 billion and that these figures would surpass 10 billion by the turn of the 21st century. The actual world statistics also suggest a similar trajectory: the world population as of December 2021 was 7.9 billion and based on current trends, we are well placed to keep to the projected population path (Department of Economic and Social Affairs of the United Nations Secretariat, 2019). It is widely accepted that population and rather, overpopulation, is an undesirable and constraining situation for global growth and development. However, it is imperative to briefly establish the factors that get affected due to population growth as a base for this paper. Typically, the population becomes an issue when the existing human population exceeds the 'Carrying Capacity of Earth'. This situation arises when mortality rates are low and fertility rates are high. Overpopulation poses multiple threats on multiple fronts such as:

- **Environment:** The very reason for the increasing burden on natural resources is the growing rate of population, wherein more than fifty per cent of environmental damage is a direct consequence of overcrowding. The damage includes deforestation, reckless

hunting of wildlife, increased pollution of water and air, excessive waste generation, etc., thereby creating a host of other problems like degradation of the environment, the rise of temperatures, climate change, glaciers melting and flooding, etc.

- **Food Insecurity:** Intensive farming methods might help for a while to feed the world, but that is a short-term fix as overall resource availability is scarce, and might lead to famine, malnutrition, starvation, diseases and general ill health caused by nutritional deficiencies in the long run.
- **Impact on Economic Aspects:** Cost of living increases exponentially as the demand pressure on current resources worsens with expanding population, causing a rise in prices of various essential commodities, including food, shelter, and healthcare. Unemployment also inevitably rises and there is a higher possibility of war and conflict with cascading social and economic impacts.
- **Other related issues:** Ecological problems like wildlife extinction, forest fires and health issues like pandemics are a few examples of how population can impact lives. The large-scale spread of the recent Covid-19 pandemic is also an example of how countries with high populations per capita have had difficulty in limiting the communicable virus.

On 27 July 2021, Elon Musk, CEO of TESLA and SPACEX company, also raised his concern about population growth in the world saying, "Population collapse is potentially the greatest risk to the future of civilization" (2021).

Having established and presented a strong correlation between the growing population and its negative impacts worldwide, especially in an already overcrowded world like the one we live in today, it is important to understand the theories and relationships that directly or indirectly determine the population statistics of a region. Historically, there have largely been three major theories of population change (Kwatiah, 2016):

Malthusian Theory of Population (1798; 1803) revolves around a weak and non-empirical relationship between food supply and population growth, where Thomas Robert Malthus expressed concerns over the limited increase in the food supply, relative to population

growth, and the consequent imbalance, thereby calling for preventive social checks.

The Optimum Theory of Population (1924) deals with the relation between wealth production and the size of the population. It talks about an ideal level of population wherein a country yields maximum income or returns, given the available resources. Population above or below this optimum point would lead to income and welfare losses.

The Theory of Demographic Transition (DTT) is a theory devised by studying actual population patterns of the advanced and now developed countries of the world. Largely, there are three distinct stages of population growth, which are a result of attributes like birth rates and death rates of a country. Initially, the population growth rate is low, with high birth rates as well as death rates. In the second stage, the death rate falls but the birth rate remains the same, while at the last stage, birth rates follow the pattern and start falling, thereby making the population growth rate very low. The ideal population growth rate that a country aims to achieve is zero at the last stage.

It is this third theory of population change that this paper attempts to explore. The first two theories are limited in their scope and applicability due to lack of empirical data and weak relationships drawn, without accounting for exogenous factors like increase in manpower leading to increase in food supply (Malthusian) and issues in measurement and evidence of optimum level population (Optimum Theory). Being based on actual trends of the now developed European countries, DTT is largely applicable and accepted across nations.

The demographic dividend is a window of opportunity that presents itself when the working population of a country exceeds the dependent population, major reasons for which are the changes in the population age structure of a country. Age structure, in turn, changes due to a decline in infant mortality and fatality rates and eventual and gradual decline in fertility rates. In this situation, the country is showered with high and accelerated economic growth as the population age structure changes. The dependency ratio decreases as the dependents (children and old citizens) decrease in number, relative to the working-age population of the country. To

fully harness demographic dividends a country needs to focus on education, employment, health, empowerment, family planning and related factors.

At present, India hosts 16 per cent of the world's population with only 2.45 per cent of the global surface area. Historically, India's population has long been seen as a developmental hindrance, constraining growth and progress in all national spheres. India's population has grown at an average rate of about 2% between 1961 to 2001, exceeding 1 billion in 2001 (Department of Economic and Social Affairs of the United Nations Secretariat, 2019).

On November 24, 2021, the findings of the National Family and Health Survey conducted for the fifth time in the country i.e. (NFHS-5), were released by the Union Health Ministry. It was conducted in two phases between 2019 and 2021 due to the COVID-19 outbreak in 2020. The findings show that the total fertility rate has declined from 2.2 in 2015-2016 to 2.0 in 2021 which is below the replacement fertility rate of 2.1. It is the total fertility rate (the average number of children born per woman) at which a population exactly replaces itself from one generation to the next, without migration. This rate is roughly 2.1 children per woman for most countries (Searchinger, 2013). Thus, India's population level is 2.0 which means the country's population is headed for decline (*National Family Health Survey-5*, 2021). In upcoming decades, the country's young population will continue to grow older because of the population momentum. India will also leave China behind in 2030 and would reach a population of 1,504 (in millions) (Department of Economic and Social Affairs of the United Nations Secretariat, 2019). Thus, the country will have to prepare to cater for the needs of the older population, provide significant importance to the nutritional needs of anaemic children and other factors which will affect the demographic transition of the country.

2.0 Demographic Transition: The Process

To simply put, Demographic Transition Theory is a predictive theory that explains the relationship between the growth rate of the population of a country and the prevalent birth rates, death rates and fertility ratios in the country and how it affects the population structure of the

same. In literal terms, 'demographic transitions' are the gradual shifts in the mortality and fertility levels (and hence, birth and death rates) from volatile and high to low and relatively stable levels. It is the historical process of gradual shifts in the population growth and age parameters- initially, a society starts from high birth rates and high death rates (specifically high child mortality rates). As society advances, infant death rates start falling and birth rates follow suit after a while. Eventually, the society reaches a stage where both birth and death rates are low and population growth stabilizes. In this process, the society's age composition, economic potential, and almost all other micro and macro parameters get impacted.

Although it was the American demographer Warren Thompson's interpretation of demographic history (Thompson, 1929) and French demographer and politician Adolphe Landry's observations that brought the relationships explaining and governing population pattern and growth potential to the forefront (Landry, 1987), it was Frank W. Notestein of the States who developed on the idea and presented a formal and systematic theory of demographic transition in 1945. His article is generally regarded as the first acceptable formulation of the demographic transition theory. Different demographers and observers have different versions and different stages in their respective explanations, but there exists a consensus over definite stages of variation in death and birth rates and population growth. Though the theory was formulated by different authors, it is largely based on the experiences and data patterns of the European colonies. Still, there is universal applicability of the theory and the demographic evolution of all the countries today can be looked at through the lens of the demographic transition model.

This process of population change, from a low level of growth to expanding growth and then the ultimate stabilization of population has been analytically classified and studied differently by different demographers. The number of successive stages differs between three and five, depending on the number of subdivisions the author in question has presented. It is typically viewed as a three-phase process, in the following order:

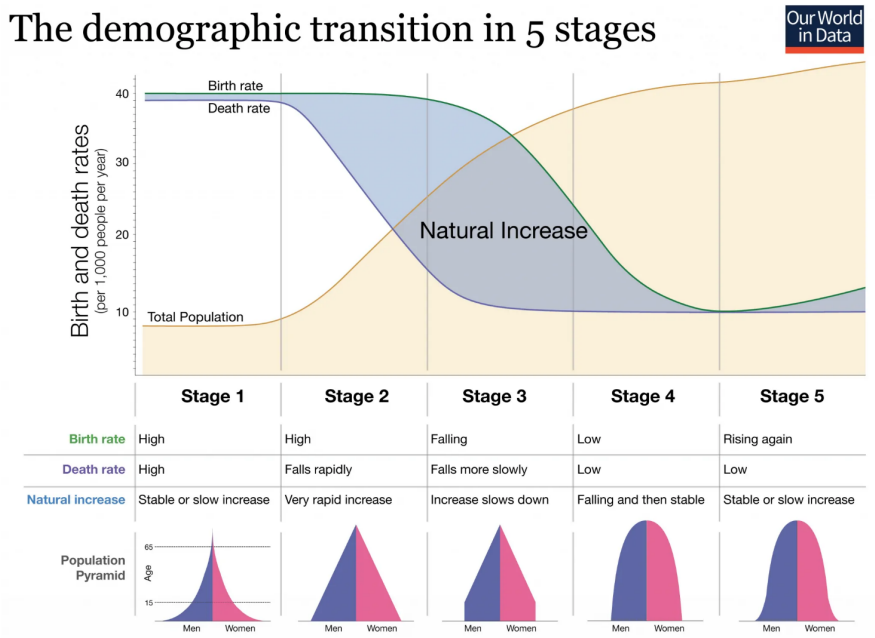
- Pre-transition phase, characterized by high mortality and fertility and with little net population growth

- Transitional phase, where mortality rates start to fall with the increasing advancement in society, while birth rates remain high, leading to rapid population growth
- Birth rates eventually and gradually start declining due to revisions in fertility choices, and population growth rate starts declining.
- Demographic stabilization due to low birth and death rates, whereby the population stabilizes at a low level.

Thus, the process consists of a logical succession of historical processes, through which every population passes in its movement towards modernity. Reasons for this evolution are technological advancements, especially in the field of healthcare, increase in incomes, education, increased overall resources, revised fertility decisions, etc. Adolphe Landry, in his work (Landry, 1987), gives it a three-stage distinction as i) primitive regime, ii) intermediate regime and iii) contemporary regime; while Notestein, who emphasized more on the influence of age composition on population growth, presents it as i) high growth potential, ii) transitional growth, and iii) potential decline. Traditionally, the stabilized population stage is considered to be the final one, but some theorists like C.P Blacker (Blacker, 1949) consider it as a fivefold process: i) high stationery, ii) early expanding, iii) late expanding, iv) low stationary and v) diminishing. Kingsley Davis also followed a similar five-stage model (Davis, 1945). However, this fifth stage is highly uncertain and different countries show different patterns of shifts to above or below replacement levels, depending upon various exogenous factors.

Presented below is a graphical explanation of the abovementioned stages of birth rates and death rates and hence population with respect to time. Beyond a doubt, such demographic changes in a country greatly influences the age and gender structure of the same, a topic we examine later in the paper. Since it was Notestein who formalized the theory and, in a way, expounded it, this paper discusses his three-phase distinction at length.

Figure 1.0: Demographic Transition Stages



Source: *Roser, 2013*

1. **Pre-Transition Phase-** Society is marked by the prevalence of both high birth rates and death rates. Due to positive checks like natural calamities and disasters and lack of preventive technological advancement, mortality is high. Since this is typically a preindustrial society, lack of food, adequate medical and healthcare facilities and poor sanitation and hygiene indicates that the population doesn't effectively grow very much due to disease and starvation. High fertility rates (and hence birth rates) are also a result of a variety of factors. Pre-industrial societies are largely rural, and its main source of subsistence is agriculture or the primary sector. In a society like this, having more children is also an economic benefit in addition to the other utility people derive from it. Due to little or no medical and healthcare infrastructure, child mortality rates are also very high along with the general death rates, which is why life expectancies are overall short, especially among the poor. Additionally, women (and their families) have high Total Fertility Ratios (TFR). Illiteracy in the society and lower income levels, especially among women are major drivers of high TFR, thereby contributing to high birth rates.

Also, a large family is regarded as necessary to augment the low family income.

Here, high birth rates are set off by high and fluctuating death rates, so effectively there is little or no population growth. More births hardly make up for the human losses, giving rise to a stagnantly populated society. Notestein also refers to this stage as one with high growth potential since there is sizable room for improvement in terms of technology, sanitation, resource utilization, economy, healthcare and education (Diggs, 2008). As mentioned in the introduction, expanding population is without a doubt a growing concern now, but without the population rising in the preindustrial era, there wouldn't exist the amount and quality of innovations, discoveries and development the world today experiences. Growing population necessitated invention and the need to increase the 'carrying capacity' of the Earth and that very process has landed humankind where it is today (Ray, 1998).

2. **The Transitional Phase (Population Explosion)-** This stage of the demographic process is characterized by a continuous decline in the mortality rates, while the birth rates remain high. As a result of this shift, a country experiences rapid population growth in this period as the death rates now are not offsetting the births in the country, thereby causing a population explosion. Primary reason for lower fatalities is continuous development and advancement in the fields of food supply, medicine, sanitation, healthcare, disease control, etc., which in turn, is generally the direct result of the industrialization process. Life expectancy goes up, and death rates, including infant and child mortality rates, go down, but since fertility decisions are sticky and span a longer period, they remain high. This stage can generally be observed in developing countries throughout the world. Historically, agricultural methods and commercialization of food supply increased, so did incomes, living standards, innovation, and overall development.

   The population in this phase explodes because the birth rates do not immediately follow the death rates in their downward course without any time lag. For one, with rising economic productivity (primarily in the agricultural sector historically), better incomes

and living standards, the carrying capacity increased. There was more room for population- though this is not a major factor for countries undergoing this transition today – and death rates declined due to betterment in health and sanitation. The primary reason for the time lag is the inertia that is inherent in fertility choices. This inertia functions at both levels- the level of the overall population and the household level. At the macro level, the distribution of population by age comes into the picture- a country that has had high birth and death rates has a younger population on average, causing the overall birth rate to be high. The sheer inertia of the age distribution guarantees that young people of reproductive age continue to enter the population (Ray, 1998).

People indulge in family planning not just because children bring love and joy into the society, but also because offspring are a substitute for missing institutions and markets like old age security, healthcare and insurance which exist in developed countries. Thus, in economic terms, there is an 'investment good' aspect to bearing children along with 'consumption good'. Also, since the country comes from a phase of high child mortality rates and the only window for their exposure to this task of childbearing and rearing comes from the previous generation, their total fertility decisions factor in potential deaths, which they compensate for by a larger number of births. Another correlated factor at play is the low opportunity costs for women to bear children. In this industrialization phase of the largely patriarchal society, female wages are traditionally lower than that of males. This decreases the value of work foregone to birth a child, hence keeping fertility high. This is especially true for developing countries that have a massive gender wage disparity. All these factors together give the country a population boom wherein a massive number of children enter the population. It is these very children who will enter the job market two decades later and will potentially facilitate economic development in the country.

3. **Fertility Decline (Second Transition)-** At this stage, time overcomes inertia, and the echo effect of a younger population starts fading. Fertility choices start getting revised

and birth rates gradually start declining. Incomes rise further, the education sector undergoes improvements, more and more women are entering the workforce (thus revising the TFR downwards) and women in general have better societal status at this stage. There is better access and awareness about contraceptive methods and family planning. In the occupational context, secondary and tertiary sectors grow (in comparison to the agricultural sector), and people realize more children doesn't necessarily mean more income. With better overall living standards and urbanization, the cost of bearing and rearing children- both explicit and opportunity cost – also increases. All these social and economic factors add up to a lowered fertility rate and hence, the net population growth of the country relatively decreases. Thus, in this phase of demographic evolution, population growth slows down as birth rates and hence fertility rates decline, life expectancy increases with public health advancements, and with respect to the age composition, the country faces an increasing number of older people- the average age of the country rises and thus, dependency ratio increases as well- more economically dependent people than income earners.

4. **Population Stabilization (Low Birth rates and Death Rates)-** This stage represents the postindustrial phase – birth rates and death rates offset each other such that the population size doesn't grow. Life expectancy is longer than ever, rapid population period ends, often with the help of self-regulation and policy measures. In this phase, most of the population is urbanized, educated, economically sound and makes a conscious effort to control family size. TFR here is lower than ever, below replacement levels, and thus population aging accelerates too. Thus, demographic transition theory is a general framework to explain and understand the demographic evolution of a country. For obvious reasons, changes in fertility and mortality rates of a country have an enormous impact on the age and gender structure of the population, which directly impact the growth prospects of the country. Although the model does not give a timeline for this whole process which, in fact, is one of the impediments for using DTT to make forecasts,

it gives a general structure as to what is likely to happen and since these changes in demographics are multi-generational in nature, the whole transition can span over decades or even a century. However, it is observed that the process of demographic transition in the developing world now is much faster than what was the case with the now developed countries when they were going through this phase. This is primarily because now, technology, in terms of improved production, healthcare, sanitation and education already exists, and is not to be invented or discovered but merely transplanted to developing areas from an existing stock of knowledge.

Most of the countries today are at the second or third stage of the process, with very few highly developed countries like Japan that have surpassed these stages and are experiencing net negative population growth (~0.34% annual change in 2020) (*Population Growth (Annual %) - Japan | Data*, 2022)

3.0 Casual Relationships between Demographic Changes and Economic Development

As population structures change throughout this demographic journey, especially with respect to age, it presents a massive opportunity for a country to accelerate economic growth. With increased access to vaccines, medical care and sanitation in the second phase, infant and child mortality declines sharply and birth rates become far in excess of the death rates, giving rise to a 'boom' generation. During this period there are a lot more children in the society than there were before that, as survival rates go up. Thus, the governments in these countries have a window of opportunity to provide these 'baby boomers' quality education and healthcare, food, shelter, clothing and thereby divert resources from other avenues to build quality human resources that will bring economic prosperity to the country 15-25 years down the line. Also, when fertility rates start declining, more women enter the workforce. Preparing to reap this dividend may temporarily slow down economic growth, but in the long run gives all the more benefits, as the dependency ratio eventually declines too.

Demographic dividend is within a country's reach if the following five forces play in its favor, as laid down by David E. Bloom, who coined the term and emphasized the importance of demography to economic growth (Bloom et al., 2003).

- A country's ability to divert social resources from investing in children to investing in physical capital, job training and technological progress.
- Swelling of the labour force as baby boomers reach working age and making room for this influx in labour supply.
- Rise in women's workforce activity that goes hand in hand with a decline in fertility.
- Working years are also the prime years for savings, a key factor for accumulation of physical and human capital and technological innovation.
- Lastly, further boost to savings as people get incentivized to save more due to increased life expectancy.

Thus, simply put, demographic dividend can accelerate a country's economic growth by capitalizing on the favorable changes in the age structure of the population i.e., more working people in the economy than dependents. Due to the asynchronous nature of the decline of fertility and mortality rates, the rate of the population tends to increase and then eventually decrease over the period of this demographic transition, also giving rise to a bulge generation in the population pyramid due to changing age structure. When this bulge generation reaches prime-age brackets for working, earning and saving, a country typically experiences a demographically induced economic boost, given that the generation is gainfully employed. However, it is imperative to note here that this demographic evolution simply increases a country's supply side potential for economic growth. It is only with the right governance, efficient financial and goods markets, and macroeconomic variables and policies that this supply potential gets adequate demand avenues for optimization. With the right policy environment during this window, demographic dividends can be harnessed and converted into accelerated economic growth. Through and in the following areas, development can be witnessed and capitalized upon:

1. ***Education***: A country that invests heavily in primary, secondary and higher education is bound to reap this dividend, as an investment in human capital can potentially give increasing returns. Providing quality and easy-access education of both kinds- classroom education and skill-building avenues- to its masses goes a long way in proving the case, especially among girls and women. Gender parity and education among women has a twofold effect: the building of valuable human capital and the lowering of fertility rates. The latter is likely to follow due to better access to contraception, career-focused life planning and primarily, educated women will attract better salaries and wages, thereby increasing the opportunity cost for having children. In this stage of demography, fewer birth rates would directly lead to economic growth as parents are able to allocate more resources per child, leading to better educational and health outcomes. Studies have demonstrated that if just 10% more girls go to school, the average GDP increases by 3% and when barriers to work are reduced for women productivity increases by 25% (USAID, 2018).
2. ***Employment Opportunities***: The ability of an economy to generate sufficient employment opportunities for increased labour supply largely makes the case for positive demographic dividend and provides valuable insights into an economy's overall performance. While this absorption of labour depends on a range of factors such as the sector composition of growth rates and the capital/labour intensity of growth within these individual sectors, there is usually a need to increase both the number of jobs and productivity of employment, along with income. Programs that promote quality job creation through economic diversification and investment strategies, skill development for meeting present and future needs of the dynamic markets as well as labour market activation and intermediation that integrate vulnerable groups (like rural poor and more women) to the formal labour sector are required as a part of country's preparedness to reap demographic potential. Education and skill building alone can impact social factors but not economic parameters, unless accessible and competitive employment avenues are created. Thus, it is imperative to focus on good governance and macroeconomic

management to ensure well-functioning labour and financial markets.

3. ***Health***: Health is an asset that individuals possess and has a major impact on the quality of human capital of a country. It is not just a consequence of economic growth but also a catalyst, as it has intrinsic well as instrumental value. Health affects economic growth directly through labour productivity and inversely causes the economic burden of illnesses. There have been multiple studies observing and concluding strong positive correlations between public health and economic growth across time periods and regions. Good health drives economic gains for the following primary reasons:
    - Healthier people are more economically productive.
    - Healthier children means less school absenteeism, implying a better educated workforce.
    - Healthier societies have higher life expectancies- indirectly causing higher savings rates.

    For these very reasons, healthier economies experience higher and faster rates of growth in per capita incomes/GDP, along with lower rates of poverty, as labour is the main asset of the poor, and quality and the ability to perform labour is a direct result of individual health. According to McKinsey Global Institute, 2020 report 'Prioritizing Health: A Prescription for Prosperity', economic benefits from health improvements are substantial enough to add $12 trillion/ 8 percent to global GDP in 2040, translating to 0.4 percent faster growth every year. These benefits arise through the labour market, both by expanding future employment through fewer early deaths, fewer health conditions, and higher labour-force participation of healthier people through the productivity gains achievable by workers who are physically and cognitively healthier'. Also, for each $1 invested in improving health, there is a possibility to reap an economic return of $2 to $4. Public health infrastructure plays the prime role here as it works to limit health disparities, and a country with greater health equity, quality and accessibility is bound to have greater and more inclusive economic growth.

4. ***Empowerment and Upliftment:*** It is extremely crucial for economies, especially developing ones[1] to adequately look into gender empowerment in all social and economic spheres of society. Government and social institutions need to support, empower and assist women and young girls in achieving gender parity and independence in all economic, social and political spheres. Economically and demographically speaking, active initiatives in this direction with shifts in gender norms and attitudes will not only ensure better reproductive planning and lowered fertility rates, but also ensure much, much better productivity and economic growth directly. According to new research (World Bank Group, 2018), gender inequality across the world is costing countries $160 trillion in wealth because of the differences in lifetime earnings between women and men. Empowering more women would significantly boost growth rates of third world economies, through increased economic diversification, productivity and income equality, thereby also resulting in positive social developmental outcomes.

   Along with working on building gender inclusive social and economic infrastructure, policies must also ensure that women and couples have access to family planning services and have the rights and freedom to make their own reproductive choices. Contraceptive and reproductive health services are basic human rights and access to these services helps in declining fertility rates, leading to demographic dividend as without a fertility decline, there will always be more young dependents. Availability of these services in a country also complements investments in health & education. Universal accessibility to these enables everyone to pursue an education, join the working force and accrue wealth, thereby accelerating economic growth at a micro level.

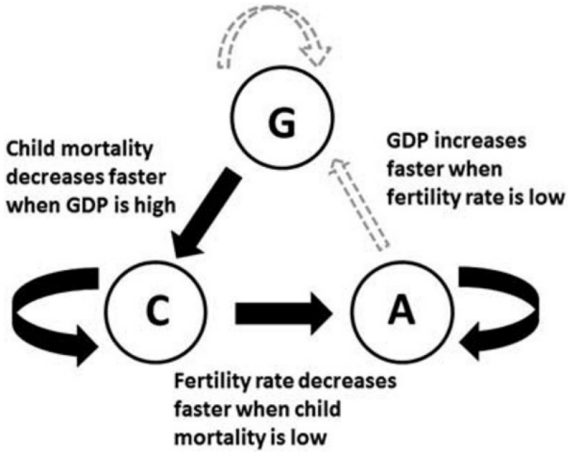
5. ***Savings:*** Countries with higher rates of savings have had faster economic growth than those with lower saving rates, as savings directly translate to investments in the classic macroeconomic accounting model. Capital accumulation creates greater opportunities for production and productivity of a developing country. As investment, and thus GDP, cannot be raised without increasing the amount of savings, in order for a country to

[1] Developing economies more often than not are the ones at the cusp of demographic dividend.

achieve sustainable economic development, it needs to increase its aggregate savings through lucrative financial investment avenues. The demographic transition itself encourages the growth of savings as working years are also the prime years for savings and people tend to save more with increased life expectancies, thus improving a country's prospects for investment and growth. Provided that these increased savings reach the formal banking systems, it will help in reducing unemployment, enabling greater technological development, and thus improving economic growth statistics, specifically in developing countries, as more savings "lead to less consumption, which could also result in a larger amount of capital investment and finally a higher rate of economic growth" (Rasmidatta, 2011). However, as nations largely have a fixed amount of resources to feed their population, especially resources like land, the demographic structure of a country can pose a serious threat to human well-being and thus economic performance of a country. Overcrowding leading to larger division of the economic pie can result in inadequate per capita availability and quality of human resources and life of a country.

Having understood the effect of demographic transition on a country's economic growth, it is also important to note that there is a multi-directional causal relationship here, where economic growth itself can crucially impact the composition of the transition process and its spread over time. There is an established negative correlation between a country's income per capita and child mortality, under an observed pattern of more money translating to better healthcare systems (Cutler et al., 2006). However, this might be a sequential relationship with a possible lagged effect. Reduction of child mortality and overall death rates then drives down fertility rates. Female education and factors discussed above also play a role in getting fertility down. In a way, a triangular development cycle can be established, using fertility rates, child mortality and GDP.

Figure 2.0: Development Cycle with Three Key Indicators: Fertility rates, Child mortality and GDP



Source: *Ranganathan et al., 2015*

In addition to the above cyclic relationship, economic growth can also directly impact fertility decisions. Using a classic Barro-Becker model, it can be inferred that increased wages, which is a direct indicator of economic progress, pose greater opportunity costs for bearing and rearing children, thereby causing a fertility decline.

Demographic transition and dividend can make or break an economy. Both processes share various multi-directional relationships, depending on a country's local context and time. The theory largely explains population evolution of most of the countries, not all countries receive the demographic dividend: it is not an automatic process, rather an opportunity for growth, utilization of which depends on how a country invests in its human capital, that too with an inclusive approach. Dividend can very quickly become a demographic burden due to misalignment of skills, education and job markets and short sighted governance. Egypt, for a long time was stuck in a demographic trap where death rates had fallen but living standards remained low, along with persistently high fertility rates. With right family planning, education and healthcare infrastructure, flexible and absorbent labour market institutions, a country can

have a larger workforce which is healthy, well-educated and productively employed, leading to an economic surge.

4.0 Case Study: India's History, NFHS-5 and the Country's Preparedness

The population growth of India during the decade of 1911–1921 was 1.2%. In 1918, Spanish flu, also called the Bombay Fever broke out in Bombay, with one of the possible routes being via ships carrying troops returning from the First World War in Europe. The Spanish flu claimed at least 12 million lives in India over a period of just three months, which was about 5% of the population and a fifth of the global death toll, thereby making India the worst-hit country (Acharjee, 2020). The decade between 1911 and 1921 was the only census period in which India's population fell, mostly due to devastation of the Spanish flu pandemic. As a result of the severity of the outbreak, the year 1919 saw a reduction of births by around 30 percent (Mills, 1986); (*NCBI - WWW Error Blocked Diagnostic*, 2000). India's population grew slowly till the 1920s, which is called the Stagnant Population Period. The year 1921 is called the "Year of the Great Divide" in the demographic history of India because from the year 1921 to 1951, the rate of population growth continued at a level of over one per cent per annum. Thus, the population increased at a constant rate leading to a steady growth of Population Period. After independence in 1951, the rate of population growth accelerated considerably because of expansion of public health services. It was a period of Population Explosion till 1981. From 1981 onwards, the Period of High Growth came into picture where the growth rate of Indian population is more than China and Sri Lanka whose population grows at a rate of 1% per year. Between 1961 and 2001, India's population grew at an average rate of about 2%, and the size of the population in absolute terms exceeded one billion in 2001. During 2001–2011, the population growth slowed down substantially.

However, India continued to add an average of 18 million people annually to its already large base, leading to a total national population of 1.21 billion in 2011. India had about 587 million people in the working ages between 15 and 59 years. Those aged 15–34 years accounted for nearly 60% (349 million). The number of people in the working ages of 15–59 years and

15–34 years increased to 733 million and 425 million, respectively, in the year 2011. Currently India's population in 2021 is 1.39 billion. Firstly, it is important to address how and why India is the second most populous country in the world right now and in order to do that, we need to understand how economic and social factors affected the population structure of the country (Ram Ram, 2021).

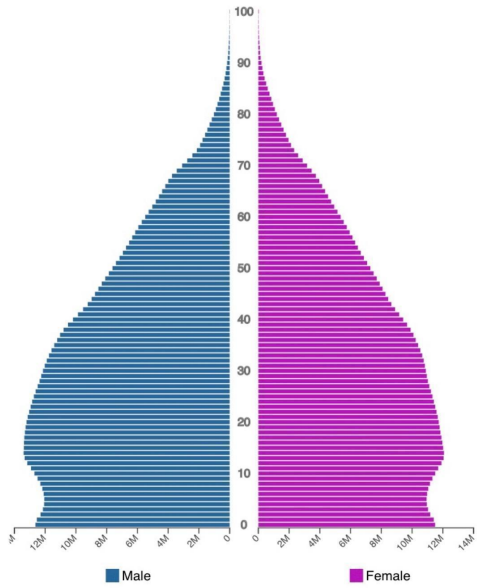
Agriculture is the primary source of livelihood for about 58% of India's population (India Brand Equity Foundation, 2017). India has achieved spectacular growth in the agriculture sector since 1966. In an agrarian society, children are never considered as an economic burden, rather they are supporting hands in agricultural activities. The parents have the economic sense to have a bigger family. They believe that the benefit of having an additional child is much greater than the cost of his/her upbringing which led to high growth rate of population in the country in the past. Poverty is a hurdle against the adoption of family planning programs by poorer sections of society. There exists a positive relationship between poverty and high fertility leading people to have more children in their family because they think having more children will create more hands of earning in the family but they are indifferent about their size of family. There is a strong possibility that people living below the poverty line have high illiteracy rates. Findings of Operation Research Group Survey shows birth rates are less and family planning is more in areas where education is widespread (*FORBIDDEN/DIRECTORY LISTING DENIED (Error 403)*, 1998). These economic factors played a vital role in changing the population structure of the society.

One of the social factors that leads to a high growth rate of population in India is the concept of universality of marriage: 76% women are married in India (Ram Ram, 2021). Earlier, there was also a custom of early marriage in the Hindu religion that is dominant in the country, that advocated a girl's marriage before her reaching puberty. The Sarda Act enacted in 1929, followed by the Child Marriage Restraint Act of 1978 in India, defined the minimum legal age for marriage as 18 years for girls and 21 years for boys. Marriage is one of the determinants of fertility and it has a significant effect on fertility and mortality levels on a macro level. At the

micro level, marriage, especially early marriage affects the lives of females as they don't have adequate access to education, health care and earning sources. Religious sayings and conventional mindets also induced Indians to have large families, and to add to that, people have deep rooted superstitions about the desire to have a male child over a girl and the idea of having sons over daughters for performing religious rites and earn religious merits, leading to the neglect of girl child's growth and also excessively causing female foeticide, through sex-selective abortions and deliberate abandonment, leading to high female mortality. Sometimes the joint family system encourages young couples to have children even though they are in no position to provide for the child but they do so because of the social pressure and the need to please their family, friends, relatives and society.

All these factors led the country towards a high fertility rate, thus increasing the population of the country with a high growth rate. At the same time, advancement in healthcare, medicine, employment, technology and resources took place, increasing the carrying capacity of the earth and life expectancies, which rapidly and continuously decreased the mortality rates leading to population explosion in the country. Changes in population trends and processes have massive impacts on a country's age structure and its composition. These aspects have been graphically presented in Figure 3, where on X-axis we measure the number of males and females in the country and on Y-axis the age structure of the country.

Figure 3.0: India's Population Pyramid, December 2021



Source: *India Population 2021 (Demographics, Maps, Graphs)*, 2021a

National Family Health Survey is a nationwide large-scale survey which is organized by the International Institute of Population Sciences (IIPS), working under the Ministry of Health and Family Welfare. The First National Family Health Survey was conducted in 1992-93. The main objective of a NFHS survey is to collect reliable and up-to-date information on fertility, family planning, mortality and maternal and child health. In this research paper, we attempt to explore the findings of the recent NFHS-5 survey that tracks the progress of the country in the health sector, effectiveness of the ongoing programs, thereby identifying the need for new programs with an area specific focus, and areas that need essential and immediate attention. It also provides information on population, nutrition and other background characteristics at national and state levels. NFHS-5 had started in 2019 but was postponed because of Covid-19 pandemic, which is why it was conducted in two phases: from 17 June 2019 to 30 January 2020 and phase two from 2 January 2020 to 30 April 2021 (*National Family Health Survey-5*, 2021).

Changes in fertility and mortality are the two most important demographic factors contributing to population growth in any country and the NFHS Survey finds that the Total

Fertility Rate (TFR), that is the average number of children a woman gives birth to in her lifetime. The TFR in India declined from about 6.5 children per woman in the early 1960s to 2.0 children per woman in 2021, a reduction of 4.5 children per woman in just a little over six decades (*National Family Health Survey*, 1992). The replacement level, which is a woman giving birth to 2.1 kids in her lifetime, is the benchmark for most of the countries (Searchinger, 2013). It means population will remain stable as total births will be balanced by total number of deaths in any country but as India has reached a fertility level of 2.0, it means the country's population is headed for decline. The decline in TFR implies that a lower number of children are being born and India's older population would increase in the next two-three decades. States which had the Total Fertility Rate higher than 2.1 were Bihar-3, Meghalaya-2.9, Uttar Pradesh-2.4, Jharkhand-2.3 and Manipur-2.2 and lowest was of Jammu & Kashmir-1.4. Childhood mortality in India has declined substantially, especially after the 1990s i.e 114 in 1990 to 35.2 child deaths per 1,000 live births in 2021, this remarkable improvement is the result of massive efforts to improve comprehensive maternal and child health programs and nationwide implementation of the national health mission (*National Family Health Survey-5*, 2021).
But focusing on the Nutritional Status of Children, we find that:-

Table 1: Nutritional Status of Children under 5 years

Nutrition Status for children under 5 years	**NFHS-4 (2015-16)**	**NFHS-5 (2019-21)**
Stunted (low height for age)	38.4%	35.5%
Wasted (low weight for height)	21.0%	19.3%

Underweight (low weight for age)	35.8%	32.1%
Severely Wasted Children	7.7%	7.5%
Overweight (high weight for height)	2.1%	3.4%
Anemic Children	58.7%	67.1%

Source: *National Family Health Survey-5*, 2021

In NFHS-3 (2005-06), the share of stunted and underweight children was 46% and 42.5% and in NFHS-4 (2015-16), it was 38.4% and 35.7%. The share of stunted and underweight children decreased by 7.6% and 4.8% but the data of NFHS-5 (2019-21) shows a diminishing rate at which the share of stunted and underweight children decreased. As it can be seen in the table above. The policymakers need to focus on this decreasing pace and more thoroughly implement policies and programmes related to nutrition of children (*NFHS-3, NFHS-4*, 2017).

India might have achieved food security but 60% of Indians cannot afford nutritious diets. While the share of women and men with below normal Body Mass Index (BMI) has decreased, the share of overweight and obese (those with above normal BMI) and the share of anaemic has increased between 2 and 4% points. The problem of anemia is more prevalent among women. In 2015-16, 53% women were anemic compared to 23% men in the 15-49 age group. These numbers have now increased to 57% and 25% for women and men respectively (*60 Percent of Rural India Can't Afford Nutritious Diets (Hindustan Times)*, 2020).

The National Family Health Survey also points out the unmet need for Family Planning which refers to fecund women who are currently married and aged between 15-49 years, and are not using contraception but who wish to postpone the next birth (spacing) or stop childbearing altogether (limiting). Unmet need for family planning is the sum of unmet need for spacing plus unmet need for limiting. Women who are classified as infecund have no unmet need because they are not at risk of becoming pregnant.

Women are considered to have unmet need for spacing if they are:

- At risk of becoming pregnant, not using contraception, and either do not want to become pregnant within the next two years, or are unsure if or when they want to become pregnant.
- Pregnant with a mistimed pregnancy.
- Postpartum amenorrhoeic for up to two years following a mistimed birth and not using contraception (*National Family Health Survey-5*, 2021).

Unmet need for spacing:

2015-16	5.7%
2019-21	4.0%

Women are considered to have unmet need for limiting if they are:

- At risk of becoming pregnant, not using contraception, and wanting no (more) children.
- Pregnant with an unwanted pregnancy.
- Postpartum amenorrhoeic for up to two years following an unwanted birth and not using contraception (*National Family Health Survey-5*, 2021).

Unmet need for limiting:

2015-16	7.2%
2019-21	5.4%

The total Unmet Need for Family Planning for currently married women aged between 15–49 years was 12.9% for 2015-16 to 9.4% for 2019-21. The total unmet need for family planning has decreased by 3.5% but there is still a need for awareness programs about family planning methods like contraception, male and female sterilization, pills, injectables and modern methods. The country needs a strong public-health care delivery system which can understand the needs and perspectives of the end-users of these technologies. The NFHS-5 also finds out that the Health Workers who ever talked to female non-users about family planning were 17.7% in 2015-16 and 23.9% in 2019-21, with just an increase of 6.2% from the last survey, NFHS-4 (*National Family Health Survey-5*, 2021). The current population of India is 1.39 billion and it will peak in 2059 with 1.65 billion people. Population of the country will increase at a decreasing/slower rate till 2059 because of the momentum inbuilt in the age structure of the population and it will start declining from the year 2060. By 2100, India's population will be 1.45 billion, 13.34% of the earth population will be in India which is 4.42% less than the peak level of 17.76% in 2013 (Ram, 2021).

The NFHS-5 survey shows that the share of under-15 population in the country has declined from 28.6% in 2015-16 to 26.5% in 2019-21 (*National Family Health Survey-5*, 2021) implying that the dependent population is in decline and will further decline in the consecutive years. India's population will continue to grow for at least 3 decades. There is a window of demographic opportunity that India will do between this time. India has the opportunity to fully utilize the workforce, considering it provides healthcare, appropriate skills (education), job training and employment opportunities which will help the country to achieve a high and accelerated economic growth. The working-age group (15-59 years) accounts for more than 60% of India's population. Therefore, it is significant for the country to take steps like policy support and reforms which will utilize India's Demographic Dividend and promote growth and development of the economy.

Examining the growth rate in larger Indian states helps to locate growth potential in the country. The four states Uttar Pradesh, Bihar, Madhya Pradesh, and Rajasthan are likely to make significant contributions to Indian population growth in the future because the fertility and mortality rates in these states are comparatively high and the decline in these rates has been much slower than that of other states. The population projections for India and its state that by the year 2036 there would be a total of 596 million Indians, and half of them would come from these four states (Ram, 2021). It is also important that working assumptions and projections are constantly revised in light of new evidence, especially in today's age, for areas such as urbanization, climate change, renewable resources and other long-term factors that have a large impact on the socio-economic context in which government policy interventions play out.

5.0 Fate of Policy Actions and Initiatives Taken in India

To tackle the population explosion problem and limit its damaging effects and to ensure infrastructural and human resource preparedness for baby boomers and additional women in the workforce, India has attempted various policy and programme initiatives throughout the years. However, in a country with the size, cultural and religious diversity like that of India, it is more often than not infeasible and impractical to successfully implement unified initiatives. Following are some of the policy, programme and campaign initiatives taken by various Indian governments over the years after Independence, some of which, however, have been highly ineffective:

- **National Programme for Family Planning:** Worldwide, India was the first country to have inculcated a family planning agenda in the development policies in 1952 (Ministry of Health and Family Welfare, 2018). The first Five Year Plans that the country introduced (1951-1966) had a strong focus on improving education and access to contraceptive methods to lower birth rates. Mediums used advocating birth control were rural service clinics, media and advertisements. The slogan ‘Hum do Hamare do’ was popularized to impact the masses. Later, with the Fourth Five Year Plan target,

sterilization clinics were also established aggressively, which, however, turned out to be really problematic due to its forceful nature and it being the reason for a large number of deaths.

- **International Conference on Population & Development (ICPD) 1994 and National Population Policy Bill 2000:** ICPD was an international conference held in Cairo, Egypt and organized jointly by the Department of Economic and Social Affairs and UNFPA, with around 179 participating governments worldwide, including India. The conference unanimously adopted the Programme of Action that focussed on the fundamental and central role of women's interests and independence in population matters. It actively talked about sexual and reproductive health of women and their reproductive rights and believed that it is through women's empowerment that family planning goals, health and education needs of people can be met and population can thus be stablilized naturally. The ICPD Declaration largely influenced the UPA's National Population Policy 2000 in India, which set one of its primary goals as bringing the Total Fertility Rate to replacement level (2.1 children per woman) by 2010 and achieve a stable population by 2045, along with consistent and sustained economic development (Ministry of Health & Family Welfare-Government of India, 2022). The program aimed to cause impact in a micro-target free manner using promotional and motivational measures and through promoting health and education especially among girls, and by increasing accessibility to a variety of contraceptives (*National Population Policy (2000) | National Health Portal Of India*, 2015). It also tackles issues related to maternal health and child survival. Although the country has made some developments on the population front, we are still far away from fulfilling ICPD commitments in their entirety.
- **Mission Parivar Vikas, 2017 and Accompanying Initiatives:** Under this umbrella mission, the current government has taken various initiatives to sensitize the masses, especially rural masses, towards the need to reduce population growth through individual efforts. The above said is being done using participatory approaches to education, media campaigns. Particularly, Mission Parivar Vikas aims to massively improve access to

contraceptives and family planning services in 146 high fertility districts (often 3 & above) in the states of Madhya Pradesh, Rajasthan, Chhattisgarh, Uttar Pradesh, Jharkhand and Assam, that almost contributes to 44% of the total Indian Population. New methods of contraception and their rebranding, compensation avenues for sterilization acceptors and insurance, clinical outreach teams and ASHAs help improve availability and delivery of contraception, pregnancy testing kits, etc. to the masses (Ministry of Health and Family Welfare, 2019). Although it is difficult to gauge the impact of a policy this recent, especially so in this particular case, as the Covid-19 pandemic put a stop to on field initiatives of the project, still, there are some differences in teenage and crude birth rates observed during NFHS III and IV that can be attributed to the efforts of this program.

- **States' Individual Population Control and Welfare Bills under Pipeline:** A number of states in India have called for and proposed disintegrated action on the population front using a variety of incentives and awareness schemes. For one, the Uttar Pradesh Population (Control, Stabilization and Welfare) Bill 2021 is in the policy debate, as the bill proposes to incentivise public servants with two or less children with additional increment, maternity/paternity leaves, 3 per cent increase in employer's contribution towards the national pension scheme, other monetary benefits and perks. At the same time, it restrains people with more than two children from contesting polls, availing promotions in public jobs or government subsidies. Similar policy was adopted by Assam in 2017 by the name of Population and Women Empowerment Policy, that focuses on ensuring safe motherhood practices and improving reproductive health in general, achieving gender equality, which, as established multiple times, is the key to population stabilization. Through this policy, the Assam government also aims to maintain declined fertility rates and strongly advocates two child policy through incentives and disincentives like barring people with more than two children from availing prime government schemes like loan waivers, etc. (Punj, 2021). The state of Rajasthan, among others, has population controlling incentives through panchayats and other local bodies,

as a factor for selecting and promoting government employees.

- **State Wise Budget Allocations and 15th Finance Commission (FC):** Through compositional changes in overall fund transfers to states from the Center, the fifteenth Finance Commission has brought about some changes in the devolution formula for the division of the money pool. This formulaic transfer is based on a deliberated upon series of indicators that largely work as proxies for economic, social, environmental and demographic progress of the respective states. The 15th FC has used Census 2011 as the population metric instead of Census 1971 that was used earlier, as the demography of states with respect to birth and death rates and migration have drastically changed in these years- using 1971 data as base becomes unfair to many states. However, this change in parameters gives the Northern Indian states some undue advantage in comparison to their Southern counterparts. The latter have implemented successful family planning programs during 1970-2010 to taper down their population growths, and this shifting of population metric would give the northern states with larger populations a fund allocation advantage over the divisible pool. However, the 15th FC attempts to tackle this challenge by introducing another parameter 'demographic performance', which aims to factor in the efforts states have put in to control and better their respective demographics, with 12.5 percent weightage devoted to it. The demographic performance is measured by using the total fertility rate of a state as a proxy indicator (Venkataraman, 2018).

6.0 Challenges and Bottlenecks

- **Population Aging:** The age composition of a society changes with demographic transition. As a country advances towards population stabilization, low fertility and mortality rates cause the elderly population to rise, thereby posing a different set of development problems for a country. High dependency ratios imply scarcity of labour to pillar the economic journey of a country. On top of this, countries need to adequately prepare for efficient social security institutions to take care of the elderly that too with financial constraints, as an aged population also implies less savings in the economy.

Developing countries especially have to build broad, inclusive and solvent social protection systems to meet demands of the elderly population, which will surely increase dramatically in the coming decades.

- **Labour Market Absorption:** It is extremely crucial and taxing for a country to develop large, efficient and flexible labour market mechanisms to ensure productive employment of the youth bulge arising out of demographic transition. The inability to deliver this can result in a catastrophic unemployment burden that can leave a country underwater.
- **Lack of Political Will to Initiate Action:** Government's interference in micro level fertility decisions is something that is too controversial for political parties to risk their elected tenures for. In democratic countries like India with a very wide range of cultures, beliefs and religions, it is extremely difficult to find common ground for issues as sensitive as family planning, as, realistically speaking, it holds the potential to offend massive vote-banks. The political weight in policies like these is too much to carry. As long as sitting governments can ignore and defer addressing the issue, they have all the incentive to do so.
- **Lack of Social and Cultural Push:** In a typical patriarchal society with gender norms and power dynamics at every chain of the societal structure, it is extremely challenging to bring about mentality and hence material changes on ground. There exist stereotypes, religious rules and traditions around healthily discussing fertility decisions and the whole idea of bearing and rearing children to complete a family influences a couple's fertility choices, rather than factors like health of the mother, capacity of the couple to provide for their child, etc.
- **Inertia of the Process and Time Problem:** Even if countries, especially like India take serious aggressive action to tackle population and quality of living issues today, it will take years or even decades for the policy/law/programme to translate into measurable changes in the country's demography. This is due to the fact that demographic transition is a multi-generational process and the stickiness of fertility decisions ensure that they decline slowly through a series of generations. This inertia of the demographic process

also further adds to the lack of political push problem as politicians in a practical world function with ulterior motives and results to showcase that would ensure their power in near future.

- **Ethical Debate regarding Population Control:** The fundamental ethical question regarding establishment of population control mechanisms is whether it is morally correct for a state to dictate personal and individual decisions like that of having children and whether it is their place to regulate. At the heart of this debate are the concepts of personhood and value of human lives. There are philosophical standpoints both for and against state intervention. Some ethicists believe that to avoid macroeconomic disasters, it is important for a government to long run optimal fertility rates, to ensure better quality human capital instead of focussing on the size of the human capital. Simultaneously, there are standard utilitarian views where it is outrightly unethical to limit formation of life today, even if that causes significant environmental and hence survival burden years later, paving way for tragedy of the commons. Moreover, there are different bioethical debates in the public domain regarding both coercive methods (like imposing fertility limits) and passive methods (awareness programs, family planning, contraceptives, etc.) of population control.
- **Straining of Global Resources:** The Population Reference Bureau, 2020 indicates that world population is projected to increase from 7.8 billion (2020) to 9.9 billion by 2050. This global increase of almost 27 per cent is bound to strain the limited land availability and life sustaining resources that the planet possesses and will limit Earth's ability to house and feed all 9.9 billion of them. Such overburdening will wear out the resources, inevitably leading to poverty, social and economic disparities, unheard-of pressure on global climate and also the planet's capacity to absorb waste.
- **Smart Budgeting and Fund Allocation Problems:** The only way for a country to reap demographic dividend is to heavily invest in development of human capital and resources, that involve building adequate health and education infrastructure, ample employment avenues, financial institutions to park savings, etc. Naturally, all of this may

require a country to tilt its budgetary allocations from other national concerns like defense, in favor of these developmental arenas. This is often extremely challenging as i) Developing countries that are to harness this dividend are usually financially constrained, and ii) There has to be a fine and balanced level of trade-off that divests funds in the right direction to ensure preparedness, which is mostly a very difficult level to arrive at.

- **Lack of Policy Foresight/Ineffective Approach to Population Tackling:** Policy formulation is a very interdisciplinary arena which requires adequate understanding of all stakeholders and areas of development being impacted, not just during the time of policy implementation but also after achieving policy outcomes. Therefore, it becomes imperative to look at the far reaching consequences of policies governing population and economics relating to it. Short sightedness can give high returns in the beginning but can cause irreversible problems for later. A good yet inconclusive example in this regard is the single child policy of China. Having one child per couple surely did bring down the country's fertility drastically and quickened the demographic transition process and gave the country huge economic benefits, but it also narrowed the demographic window and is aging the population structure, proving itself to be a band aid solution to the population problem. Devising economically and politically realistic programs to deal with these challenges is extremely crucial, though beyond the scope of this paper.

7.0 Recommendations

A lot of states in the country are at different stages of their demographic transition, the government needs to focus on a strategy that will help each state individually to reach their goals and the country as a whole. Through our research we find certain areas that India should be concerned about Gender Dividend, it suggests that the economy would be more productive by closing gender gaps in the labour market. An increased economic growth can be utilized with investments in young women and girls education, employment opportunities and also towards gender equality, where they are able to take their own health and fertility decisions.

While national programs such as the National Programme for Health Care for the Elderly and

National Action Plan for Senior Citizens provide a broad policy framework and guidelines, more emphasis should be laid on social security schemes and geriatric care for the older population as it will increase over time due to population growth slowing down as per current Indian statistics and projections. According to NFHS-5, there is nutrition deficiency among 67% children under 5 & 59% of girls in the age group of 15-19 are anaemic, which will have serious implications on a child's physical and brain development. These numbers indicate a bleak future for the country as with the absence of adequate and nutritious food, children won't be able to contribute towards the development of the country and will have low immunity making them incapable of fighting diseases. In 2014-15, Rs. 13,000 crore were provided for mid-day meals which had been reduced to Rs. 11,000 crore in 2019-20, which, in all likelihood has increased the rate of malnutrition (*Child Malnutrition Rises in Five Years, as per NFHS-5 Data | India Water Portal*, 2021). Thus, the government should pay proper attention to the upbringing of the children and also focus on developing a strong public health care system which would promote use of contraception and reproductive autonomy decisions leading to reduction in unmet needs and in turn, child fertility rate.

A comprehensive plan of investing in education, health and skill development for the youth should be in place too, so that they have the prerequisite skills before they enter the job market. We will be able to focus and implement targeted strategies for specific population groups too, as the population growth rate is going to be slowed down and we can use the resources in the most optimal way as it will not be scattered over a large population. Policy focus should be on building soft and hard infrastructure. Therefore, it will be more beneficial for the country to shift its policy to building soft and hard infrastructure, invest in making room for the elderly, promoting holistic growth of the children, youth and women, than putting its scarce resources to something that is naturally taking course- population control.

In this light, it is also important for India to understand and scrutinize lived experiences of other countries before making policy decisions especially on matters like this which have a generational impact. China's one child policy and its adverse consequences for the age structure

of an already aging society is of relevance here. China's policy increased the dependency ratio and also skewed the gender ratio negatively as sex selective abortions increased, worsening the country's socioeconomic state. Fertility rates surely fell rapidly and in the short run, the policy bore a lot of fruit in terms of economic development, but it did pose a whole new set of challenges for the country. To truly leverage the demographic transition, it would require equal and strong emphasis in all these areas.

8.0 Conclusion

This research has attempted to understand the large overarching demographic theory and model that loosely explains the population evolution processes that different countries undergo, the factors defining the process and the arenas of development getting affected by age distributions and structures. Though the DTT model was based on real life observations of European economies, the theory has by and large been applicable to other countries including India, where the timespan of the stages, external factors and the magnitude of birth and death rates dynamic has been different. The paper, along with understanding the causal relationships between economic development and population growth, has explored these factors in the Indian context by briefing describing the demographic history of the country, its current state and projections and policy initiatives taken so far. It also attempts to give some recommendations as to what the focus areas of this population control policy debate should be, avenues for improvement, etcetera. With reference to worldwide evidence and this research, it is clear that the population and specifically its structure that now favors the elderly, needs to be tackled with strong policy action on various levels. Talking about India, though it is already moving towards low population growth and might have negative growth a few years down the line, it is extremely crucial to shift the debate towards building strong social infrastructural systems like education and healthcare, public old age care systems to accommodate the aging population, increase labour market efficiencies in value as it won't increase in volume with increasing dependents in the country, and take participatory approach to ensure public preparedness.

References

Acharjee, S. (2020, March 19). *Pandemics of the Past | India Today Insight*. India Today. https://www.indiatoday.in/india-today-insight/story/coronavirus-pandemics-of-the-past-1656730-2020-03-18.

Agarwal, P. (2021, November 2). *The Demographic Transition Model –*. Intelligent Economist. https://www.intelligenteconomist.com/demographic-transition-model/

BLACKER, C.P. (1949) : "Stages of population growth", The Eugenics Review, 39 (3).

Bloom, D. E. (2001, December 20). *Economic Growth and the Demographic Transition*. NBER. https://www.nber.org/papers/w8685

Bloom, D. E., Canning, D., & Sevilla, J. (2003). *The Demographic Dividend: A New Perspective on the Economic Consequences of Population Change* (1st ed.). RAND Corporation. http://www.jstor.org/stable/10.7249/mr1274wfhf-dlpf-rf-unpf

Chand, S. (2013, December 9). *The Theory of Demographic Transition | Population*. Your Article Library. https://www.yourarticlelibrary.com/population/the-theory-of-demographic-transition-population/10895

Child malnutrition rises in five years, as per NFHS-5 data | India Water Portal. (2021). India Water Portal. https://www.indiawaterportal.org/articles/child-malnutrition-rises-five-years-nfhs-5-data

David S. Reher, R. D. L. (2011). Demographic Transition and Its Consequences. *A POPULATION AND DEVELOPMENT REVIEW Supplement to Vol. 37, 2011 NT*.

Davis, K. (1945). The World Demographic Transition. *The ANNALS of the American Academy of Political and Social Science*, *237*(1). https://doi.org/10.1177/000271624523700102

Department of Economic and Social Affairs of the United Nations Secretariat. (2019). World Population Prospects 2019. *United Nations*. Published. https://population.un.org/wpp/Publications/Files/WPP2019_Highlights.pdf

Diggs, J. (2008). Demographic Transition Theory of Aging. *Encyclopedia of Aging and Public Health*. https://doi.org/10.1007/978-0-387-33754-8_123

FORBIDDEN/DIRECTORY LISTING DENIED (Error 403). (1998). RAND. https://www.rand.org/pubs/issue_papers/IP176.html\

Futures Group Global. (n.d.). *Demographic Dividend*. Health Policy Project. Retrieved 2021, from http://www.healthpolicyproject.com/index.cfm?ID=topics-DemographicDividend

India Brand Equity Foundation. (2017, July 17). *Indian Agriculture Industry*. https://www.ibef.org/industry/agriculture-india.aspx

India Population 2021 (Demographics, Maps, Graphs). (2021a). World Population Review. https://worldpopulationreview.com/countries/india-population

International Conference on Population and Development (ICPD). (1994). United Nations Population Fund. https://www.unfpa.org/events/international-conference-population-and-development-icpd

Investing in Women and Girls for a Gender Dividend. (n.d.). PRB. Retrieved 2021, from https://www.prb.org/resources/investing-in-women-and-girls-for-a-gender-dividend/

Jha, A. (2021, November 25). *The key demographic transitions captured by the 5th round of NFHS*. Hindustan Times. https://www.hindustantimes.com/india-news/the-key-demographic-transitions-captured-by-the-5th-round-of-nfhs-101637777904158.html

King's College London. (2019b, August 28). *Women are the key to economic development in third-world countries*. https://www.kcl.ac.uk/news/women-are-the-key-to-economic-development-in-third-world-countries

Kwatiah, N. (2016, March 2). *Top 3 Theories of Population (With Diagram)*. Economics Discussion. https://www.economicsdiscussion.net/theory-of-population/top-3-theories-of-population-with-diagram/18461

L. (2021, July 11). *Two-child policy on anvil in Uttar Pradesh, Assam: What have they proposed*. Mint. https://www.livemint.com/news/india/twochild-policy-on-anvil-in-uttar-pradesh-assam-what-have-they-proposed-11625917891178.html

L. (2021, July 27). *Elon Musk, father of 7, warns of 'population collapse.'* Mint. https://www.livemint.com/news/world/elon-musk-father-of-7-warns-of-population-collapse-11627348863070.html

Landry, A. (1987). Adolphe Landry on the Demographic Revolution. *Population and Development Review*, *13*(4). https://doi.org/10.2307/1973031

Mills, I. (1986). The 1918–1919 Influenza Pandemic— The Indian Experience. *The Indian Economic & Social History Review*, *23*(1), 1–40. https://doi.org/10.1177/001946468602300102

Ministry of Health & Family Welfare-Government of India. (2022). *Family Planning :: National Health Mission*. National Health Mission. https://nhm.gov.in/index1.php?lang=1&level=2&sublinkid=821&lid=222

Ministry of Health and Family Welfare. (2018, October 24). *National Programme for Family Planning | National Health Portal Of India*. National Health Portal. Retrieved December 23, 2021, from https://www.nhp.gov.in/national-programme-for-family-planning_pg

Ministry of Health and Family Welfare. (2019, November 22). *Population Control: Ministry of Health and Family Welfare*. Press Information Bureau. Retrieved December 22, 2021, from https://pib.gov.in/PressReleasePage.aspx?PRID=1593004

National Family Health Survey-5. (2021). Indian Institute of Population Sciences. http://rchiips.org/nfhs/NFHS-5_FCTS/India.pdf

National Family Health Survey. (1992). National Family Health Survey, India. http://rchiips.org/nfhs/india1.shtml

National Population Policy (2000) | National Health Portal Of India. (2015, April 30). National Health Portal. https://www.nhp.gov.in/national-population-policy-2000_pg

National Population Policy. (2020). Ministry of Health and Family Welfare. https://pib.gov.in/PressReleasePage.aspx?PRID=1601839

NCBI - WWW Error Blocked Diagnostic. (2000, October 7). NCBI, U.S. National Library of Medicine. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1118673/

NFHS-3, NFHS-4. (2017). Business Standard. https://www.business-standard.com/article/news-cm/as-per-the-national-family-health-survey-nfhs-4-2015-16-35-7-per-cent-children-below-five-years-are-underweight-117081101085_1.html

Officer, P. A. C. E. (2017, November 16). *Demographics and Their Implications for the Economy and Policy*. https://www.clevelandfed.org/newsroom-and-events/speeches/sp-20171116-demographics-and-their-implications-for-the-economy-and-policy.aspx

PAPP101 - S01: Demography on the world stage. (n.d.). Population Analysis for Policies & Programmes. Retrieved 2021, from https://papp.iussp.org/sessions/papp101_s01/PAPP101_s01_090_010.html

Parthasarathy, A. P. U. (2021, December 2). *India's Fertility Rate Falls, But the Story is Different for Some States*. TheQuint. https://www.thequint.com/amp/story/voices/opinion/indias-fertility-rate-falls-but-the-story-is-different-for-some-states

Policy Project of the Futures Group. (2004). *POLICY Project - POLICY Project Publications - Abstract for Understanding the Demographic Dividend*. Policy Project. http://www.policyproject.com/abstract.cfm/1593

Population Control. (2019). Ministry of Health and Family Welfare. https://pib.gov.in/PressReleasePage.aspx?PRID=1593004

Population Dynamics in India and Implications for Economic Growth. *PROGRAM ON THE GLOBAL DEMOGRAPHY OF AGING*.

Population growth (annual %) - Japan | Data. (2022). The World Bank. https://data.worldbank.org/indicator/SP.POP.GROW?locations=JP

Population of India. (2021). Statistics Times. https://statisticstimes.com/demographics/country/india-population.php#google_vignette

Population Reference Bureau. (2020, July). *2020 World Population Data Set*. https://www.prb.org/wp-content/uploads/2020/07/letter-booklet-2020-world-population.pdf

Ram Ram, U. F. (2021, April 26). *Demographic Transition in India: Insights Into Population Growth, Composition, and Its Major Drivers*. Oxford Research Encyclopedias. https://oxfordre.com/publichealth/view/10.1093/acrefore/9780190632366.001.0001/acrefore-9780190632366-e-223#acrefore-9780190632366-e-223-div1-3

Ranganathan, S. R., Swain, R. S., & Sumpter, D. S. (2015). The demographic transition and economic growth: Implications for development policy. *Palgrave Communications*. https://doi.org/10.1057/palcomms.2015.33

Ray, D. (1998). *Development Economics* (Illustrated ed.). Princeton University Press.

Remes, J., Linzer, K., Singhal, S., Dewhurst, M., Dash, P., Woetzel, J., Smit, S., Evers, M., Wilson, M., Kristin-Anne Rutter, & Ramdorai, A. (2021, July 1). *Prioritizing health: A prescription for prosperity*. McKinsey & Company. https://www.mckinsey.com/industries/healthcare-systems-and-services/our-insights/prioritizing-health-a-prescription-for-prosperity

Roser, M. (2013, May 9). *World Population Growth*. Our World in Data. https://ourworldindata.org/world-population-growth

Searchinger, T. (2013, July 8). *Achieving Replacement Level Fertility*. World Resources Institute. https://www.wri.org/research/achieving-replacement-level-fertility

Stapleton, A. (2020, March 13). *Egypt: Demographic dividend or ticking time bomb?* Castlereagh. https://castlereagh.net/egypt-demographic-dividend-or-ticking-time-bomb/

The 15th Finance Commission and Changes in the Devolution Formula: Which States Stand to Lose? (2021, July 19). Accountability Initiative: Responsive Governance. https://accountabilityindia.in/blog/15th-finance-commission-report-devolution-formula-accountability-initiative/

Thompson, W. S. (1929). Population. *American Journal of Sociology*, *34*(6), 959–975. http://www.jstor.org/stable/2765883

USAID. (2018, January). *Girls' Equality and Education*. https://www.usaid.gov/sites/default/files/documents/1865/USAID_Girls_Education-Fact-Sheet_11118.pdf

Venkataraman, J. (2018, March 31). The Hindu explains: why the 15th Finance Commission has riled some States. *The Hindu*. https://www.thehindu.com/news/national/the-hindu-explains-why-the-15th-finance-commission-has-some-states-riled/article23384141.ece

Vial, J., Barrabés, C., & Moreno, C. (2013). *The Challenges of the End of the Demographic Transition*. OpenMind. https://www.bbvaopenmind.com/en/articles/the-challenges-of-the-end-of-the-demographic-transition/

World Bank Group. (2018, May 30). *Globally, Countries Lose $160 Trillion in Wealth Due to Earnings Gaps Between Women and Men*. World Bank. https://www.worldbank.org/en/news/press-release/2018/05/30/globally-countries-lose-160-trillion-in-wealth-due-to-earnings-gaps-between-women-and-men

World Population Clock: 7.9 Billion People (2021) - Worldometer. (2021). Worldometer. https://www.worldometers.info/world-population/