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## HUMAN RESOURCES AND ECONOMIC DEVELOPMENT

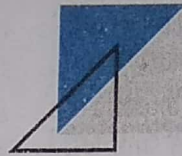
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*"We do not believe in anarchy in material production, and we do not believe in anarchy in human reproduction. Man must control nature and he must also control his numbers".*

— **Population Policy in Communist China**

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The study of human resources is vital from the point of view of economic welfare. It is particularly important because human beings are not only instruments of production but also ends in themselves. It is necessary to know in quantitative terms the number of people living in a country at a particular time, the rate at which they are growing and the composition and distribution of population.



### 1. THE THEORY OF DEMOGRAPHIC TRANSITION

The theory of "demographic transition" postulates a three stage sequence of birth and death rate as typically associated with economic development.

**First Stage of Demographic Transition.** According to this theory, death rates are high in the first stage of an agrarian economy on account of poor diets, primitive sanitation and absence of effective medical aid. Birth rates are also high in this stage as a consequence of widespread prevalence of illiteracy, absence of knowledge about family planning techniques, early age of marriage and, last but not the least, as a consequence of deep-rooted social beliefs and customs about the size of the family, attitude towards children, etc. Moreover, in a primitive society there are economic advantages of a large family size. "Children contribute at an early age . . . and are the traditional source of security in the old age of parents. The prevalent high death rates, especially in infancy, imply that such security can be attained only when many children are born."<sup>1</sup> In such a society the actual rate of growth of population is not high since high birth rate is balanced by high death rate. It is a stage of high growth potential but of low actual growth.

**Second Stage of Demographic Transition.** Rise in income levels enables the people to improve their diet. Economic development also brings about all-round improvement including the improvement in transport which makes the supply of food regular. All these factors tend to reduce death rate. Thus in the second stage, birth rate remains high but death rate begins to decline rapidly. This accelerates the growth of population. High growth potential of the first stage is realized in the high actual growth in the second stage as a consequence of decline in death rate. High birth rate and falling death rate contribute to the growth of the average size of the family in the second stage.

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1. Coale, A. J. and Hoover, E. M., *Population Growth and Economic Development in Low-Income Countries*, Oxford University Press, 1959, p. 10.



### The Third Stage of Demographic Transition.

Economic development further changes the character of the economy from an agrarian to a partially industrialized one. With the growth of industrialization, population tends to shift away from rural areas towards industrial and commercial centres. Growth of urban population, "with the development of economic roles for women outside the home, tends to increase the possibility of economic ability that can better be achieved with small families, and tends to decrease the economic advantage of a large family. One of the features of economic development is typically increasing urbanization, and children are usually more of a burden and less of an asset in an urban setting than in a rural."<sup>2</sup> The consciousness to maintain reasonable standard of living tends to reduce the size of family in an industrialized economy; since the death rate is already low, this is possible only if birth rate falls. Thus, the characteristics of the third stage are low birth rate, low death rate, small family size and low growth rate of population. This is the stage of incipient decline of population.

These three stages reveal the transformation of a primitive high birth and high death rate economy into a low birth and low death rate economy. When an economy shifts from the first stage to the second stage of demographic transition, an imbalance is created in the economy as a result of falling death rate but relatively stable birth rate. Historically it has been observed that death rate can be controlled more easily because the measures to reduce death rate are exogenous<sup>3</sup> in nature and hence readily acceptable to the people. But the reduction of birth rate can be brought about by operating on endogenous factors, like changing social attitudes and customs, beliefs and dogmas about the size of the family, about marriage, etc. This requires a much longer time than the fall of death rate. Consequently, birth rate tend to fall after a time lag. The second stage of demographic evolution has, therefore, been termed as the stage of population explosion. This stage is the most hazardous period for a developing economy. The decline in death rate in the second stage, therefore, creates an imbalance which requires a period of transition for adjustment. Thus, the theory is termed as the theory of demographic transition. During the period of transition the demographic factors get out of harmony. A new constellation of demographic forces is brought about which changes the character of society; birth and death rates become balanced at a lower level as a result of which growth rate of population also declines.

2. *Ibid.*, p. 11.

3. Exogenous factors refer to the factors controlling diseases, improving nutrition levels, sanitation which can be operated from without. Endogenous factors refer to social attitudes, habits, family relations, attitude towards women, children, contraceptives, etc., which are intimately related to social behaviour of men and women and cannot be easily operated from without.

## 2. SIZE AND GROWTH RATE OF POPULATION IN INDIA

India today possesses about 2.4 per cent of the total land area of the world but she has to support about 17 per cent of the world population. At the beginning of this century India's population was 236 million and according to 2001 census, the population of India is 1,027 million. A study of the growth rate of India's population can be made from the table 1.

A Study of growth rate of India's population falls into four phases:

- 1891-1921: Stagnant population
- 1921-1951: Steady growth
- 1951-1981: Rapid high growth
- 1981-2001: High growth with definite signs of slowing down

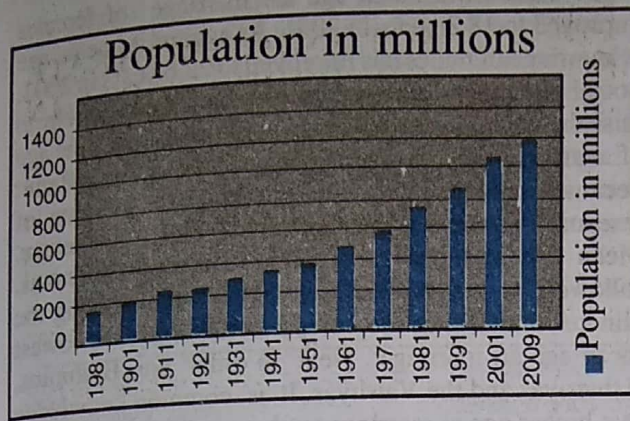
During the first phase of 30 years (1891 to 1921), the population of India grew from 236 million in 1891 to 251 million in 1921 i.e., just by 15 million. The compound annual growth rate was negligible i.e., 0.19 per cent per annum for the period. The growth of population was held in check by the prevalence of a high death rate against a high birth rate. Birth and death rates were more or less equal during this period. India was in the first stage of demographic transition in this period marked by stagnant population.

TABLE 1. Growth of Population in India (1891-2008)

Census Year	Population in millions	Increase or decrease (in millions)	Percentage increase or decrease
1891	236		
1901	236	0.0	0.0
1911	252	+16	+5.7
1921	251	-1	-0.3
(1891--1921)		+15	+0.19
1931	279	+28	+11.0
1941	319	+40	+14.2
1951	361	+42	+13.3
(1921--1951)		+110	+1.22
1961	439	+78	+21.5
1971	548	+109	+24.8
1981	683	+135	+24.7
(1951--1981)		+322	+2.14
1991	844	+161	+23.5
2001	1,027	+183	+21.3
2009	1,170	+143	+13.9
<i>Compound annual growth rate of population</i>			
1891--1921			0.19
1921--1951			1.22
1951--1981			2.15
1981--1991			2.11
1991--2001			1.93
2001-2009			1.64

SOURCE : *Census of India 2001, Series 1, Paper 1 of 2001, Provisional Population Totals. Economic Survey, 2009-10*





During the second phase of 30 years (1921 to 1951), the population of India grew from 251 million in 1921 to 361 million in 1951 i.e., by 110 million. The compound growth rate of population was 1.22 per cent per annum which can be considered as moderate. The main reason for the increase in population growth rate was a decline in death from about 49 per thousand to 27 per thousand, but compared with this, there was a very small decrease in birth rate. The fall in death rate was largely due to the control of widespread epidemics like plague, small pox, cholera etc. which took a heavy toll of human lives. India had started its entry into the second phase of demographic transition during this period which marked a steady but low growth rate of population.

During the third phase of 30 years (1951 to 1981), the population of India grew from 361 million in 1951 to 683 million in 1981. In other words, there was a record growth of population by 322 million in a period of 30 years. This gives a compound annual growth rate of 2.14 per cent which is nearly double the growth rate of the previous phase. With the advent of planning, the extension of hospitals and medical facilities was undertaken on a big scale and these measures of death control resulted in a further and sharp decline of death rate to a level of 15 per thousand, but the birth rate fell very tardily from 40 to 37 per thousand during this period. As a consequence, there was a population explosion during this period.

During 1981 to 2001, India entered the fourth phase of high population growth with definite signs of slowing down. Total population increased from 683 million in 1981 to 1,027 million in 2001 indicating an increase of 50.4 per cent during the 20 year period. The annual average rate of growth of population during 1981-2001 was of the order 2.05 per cent.

During the decade (1991-2001), population grew from 844 million to 1,027 million — an increase of 183

million. The annual average rate of growth registered a decline to 1.93 per cent. There is further decline in population growth to 1.64 per cent during 2001-09. This is a welcome trend which should be strengthened.

Rate of growth of population is a function of birth rate and death rate. Consequently, variations in birth and

TABLE 2. Average Annual Birth and Death Rates in India

Decade	Births per 1,000	Deaths per 1,000
1891-1900	45.8	44.4
1901-1910	48.1	42.6
1911-20	49.2	48.6
1921-30	46.4	36.3
1931-40	45.2	31.2
1941-50	39.9	27.4
1951-60	40.0	18.0
1961-70	41.2	19.2
1971-80	37.2	15.0
1985-86	32.6	11.1
2008-09	22.8	7.4

SOURCE : *Census of India*, 1971, Age and Life Tables and *Census of India* 1981, Series I, India, Paper 1 of 1984, and *Office of Registrar General, and Ministry of Health and Family Welfare, Annual Report (2000-01) and Economic Survey (2009-10)*

death rates can provide an explanation of the acceleration of the population growth experienced in India. The birth and death-rates for India are given in Table 2.

Table 2 clearly reveals that the growth of population was held in check by the high birth and high death rates prevalent in India before 1921. Birth rate during 1901--1921 fluctuated between 46 and 49 per thousand and the death rate between 42 and 48. Correspondingly, the growth of population was little or negligible. But after 1921, a clear fall in death rate is noticeable. Death rate which stood at 48.6 per thousand in 1911-20 came down to 18.9 during 1961-70. As against it, the birth rate showed a slight decline. As a consequence of the family planning drive birth rate also registered a decline to 22.8 per thousand in 2009. Death rate has further fallen to a level of 7.4 per thousand. Consequently, the gap between high birth and falling death rates widened with the passage of time and this was reflected in a high survival rate. Thus, the high growth rate of population can be explained in terms of a persistently high birth rate but a relatively fast declining death rate.

Prior to 1921, India was in the first stage of demographic transition. But from 1921 onwards it has entered into the second stage of demographic transition in which the high growth potential of the population was realised as a high actual growth of population. It is expected that shortly India will enter the third stage.



**Table 3. Birth and Death Rates (IMR) for 15 major States of India**

State	Birth Rate	Death Rate	IMR	Mean age <sup>a</sup> at marriage (Females)
1. Kerala	14.6	6.8	17	20.3
2. Tamil Nadu	15.1	7.2	18	20.2
3. Andhra Pradesh	16.4	7.5	20	17.8
4. Maharashtra	17.0	6.8	20	19.1
5. Karnataka	18.8	7.4	21	19.4
6. West Bengal	17.5	6.2	17	18.5
7. Punjab	17.3	7.2	20	20.3
8. Orissa	21.4	9.0	21	18.5
9. Gujarat	22.4	8.9	22	20.4
10. Haryana	23.0	8.9	25	19.2
11. Assam	23.0	8.6	26	
12. Bihar	28.0	7.2	28	18.8
13. Madhya Pradesh	28.0	8.4	22	18.8
14. Rajasthan	27.5	6.8	20	18.4
15. Uttar Pradesh	29.1	8.4	20	19.3
All India	22.8	7.4	25	19.4

Source: <sup>a</sup>Office of the Registrar General, India and Economic Survey (2007-08)

Statewise analysis of data pertaining to birth and death rates reveals that Kerala, Tamil Nadu, Andhra Pradesh, West Bengal, Karnataka, Maharashtra and Punjab have achieved a birth rate below 20 per thousand. In this sense, they have entered the third stage of demographic transition. Ironically, Haryana and Gujarat which occupies a high place in India in terms of per capita income, are also far behind in reducing birth rate. As against it, Uttar Pradesh and Rajasthan, Bihar, and Madhya Pradesh have a very high birth rate in the range of 25-31 per thousand. All these states are still in the second stage of demographic transition, but taken together they account for 64 per cent of the total Indian population. Unless an impact is made by the family planning programmes in these states, India as a whole will not be able to enter the third stage of demographic transition.

**Birth Rate**

Fertility depends on (i) age at which females marry, (ii) duration of the period of fertile union, and (iii) the rapidity with which they build their families.

In India, mean age at marriage has been low as compared to other countries of the world. (Refer table 4). However, it has been slowly rising between 1891 and 1961. The passing of the Child Marriage Restraint Act (popularly known as Sharda Act) in 1929 did have some effect and child marriages declined. This is evidenced by the fact that whereas 27 per cent of girls below the age of 14 were married during 1891-1901 decade, only 6.6 per cent in the age group 10-14 were married in 1991. This is a healthy development. Mean age at marriage for females was 13.7 years in 1921, it improved to 15.8 in 1961. During the last 30 years, there has been slight

improvement and mean age at marriage of females improved to 14.3 years in 2001. As against it, mean age at marriage of males has improved to 22.8 years in 2001. Social awareness and spread of education can help to raise the mean age at marriage in future. Raising the age at marriage is, however, likely to be more difficult because in many rural areas, there is a feeling of insecurity about an unmarried girl of marriageable age. Mean age at marriage is highest among Christians, followed by Sikhs, Muslims and Hindus. Among the Hindus, females of depressed caste have the lowest mean age at marriage. Next in order are Brahmins, Kshatriyas and the Vaishtyas. It is common knowledge that higher age at marriage tends to reduce fertility and this lowers birth rate.

With an increase in the mean age at marriage and the impact of family planning programmes, there is an overall decline in general fertility rate from 171 per thousand married women in 1988 to about 154 in 1993. It may also be noted that the decline is in all age groups, though the decline was sharper in the age groups 30-34 and above, as compared with age group 15-19. There was a strong need to reduce fertility rates in the lower age groups, more especially 15-29, 20-24 and 25-29 so that general fertility rate registers a sharp decline. We witness a sharp decline in fertility rates across all age groups. Sharpest decline is registered in age group 15-19, 40-44, 35-39 and 30-34.

**Table 4. Mean age at marriage in Selected Countries**

	Males	Females
Norway	28.0	24.4
East Germany	27.4	24.7
France	26.0	22.6
Japan	25.8	23.0
India	(1921) 20.7	13.7
	(1961) 21.6	15.8
	(2001) 22.6	18.3

**Table 5: Age-Specific Fertility Rates in India**

Age Group (years)	1988	1993	2007	Percentage 1993-2007
15-19	259.0	236.1	41.1	82.6
20-24	319.8	307.9	213.9	30.5
25-29	227.9	207.6	158.3	23.7
30-34	138.5	121.3	75.2	38.0
35-39	81.2	65.7	31.7	51.8
40-44	38.9	31.8	12.3	61.3
TFR	5.4	4.9	2.68	45.3
GFR	170.7	153.7		

Notes: TFR = Total Fertility Rate

GFR = General Fertility Rate

Fertility seems to have a strong correlation with the educational level of the mother. Census of India (2001) reveals that the total fertility of illiterate women for India is 4.2. It declines to 3.7 for women with



educational level literate but less than middle school, it further declines to 3.3 for middle but not matric and is the lowest (2.1) for women with educational level graduate and above and above. Fertility in every category was higher in rural areas than in urban areas. Data published by Government claims further decline in overall fertility. Decline is sharp among educated women. This underlines the need to educate girls to achieve our objective of population control.

**TABLE 6 : Total Fertility by Women's Educational Level in India (1998-99)**

Educational Level	Total No. of Children Born (15-49)		
	2005-06	2001	1991
Illiterate	3.55	4.2	4.4
Literate	-	3.3	3.8
Literate below middle	2.51	3.7	4.3
Middle but below matric	2.23	3.3	3.8
Matriculate but below graduate	2.08	2.7	3.0
Graduate and above	-	2.1	2.3
All Educational Levels	2.68	3.8	4.3

Source: *Census of India (2001), Fertility Tables; Government of India, Selected Socio-Economic Statistics, India, 2008*

According to Census Commissioner (2001), there is a positive correlation between population growth rate and the child population in the age group 0-6. In India, the proportion of children in the age group 0-6 declined from 17.94 per cent in 1991 to 15.42 per cent in 2001. A fall in the proportion of children in the age group 0-6 is indicative of a fall in fertility. In Kerala, Tamil Nadu, Andhra Pradesh, Karnataka and Gujarat, the percentage of population in the age group 0-6 is below the national average while in states like Haryana, Meghalaya, Rajasthan, Uttar Pradesh, Bihar, Jharkhand and Madhya Pradesh, it is much higher than the national average.

**TABLE 7: Percentage of the child population in the age group 0-6 to total population in selected states**

	1991	2001
Kerala	13.19	11.48
Tamil Nadu	13.33	10.98
Andhra Pradesh	16.49	12.77
Karnataka	16.63	12.94
Gujarat	16.48	14.19
Maharashtra	17.11	13.63
India	17.94	15.42
Haryana	18.98	15.46
Madhya Pradesh	19.94	17.58
Rajasthan	20.13	18.51
Bihar	20.70	19.59
Jharkhand	20.17	17.82
Uttar Pradesh	20.38	16.35
Meghalaya	22.18	19.84

Source: *Census of India 2000, Series 1, India, Provisional Population Totals.*

## Death Rate

In the advanced countries of the world in the beginning of the 19th century, death rate ranged between 35-50 per thousand. It has now come down to 7-8 per thousand. This steep fall in death rate is the result of provision of better diet, pure drinking water, improved hospital facilities, better sanitation and last but not least, the control by wonder medicines of several epidemic and other diseases which took a heavy toll of human life. (Refer table 7)

During the 1891-1901 and 1911-21 decades, the growth of population was insignificant. This can be attributed to widespread famines and the influenza epidemic of 1918 which killed about a million persons. The death rate during this particular year rose to an astonishing figure of 63 per thousand, though in the preceding and succeeding year, it was 33 and 36 respectively.

Another important factor contributing to low death rate is the decline in infant mortality. The infant mortality rate which stood at 218 per thousand in 1916-20 had come down in 1989 and further to 57 per thousand for males and 64 per thousand for females. For the country as a whole, it was 60 for 2003. The principal causes of infant mortality are : malnutrition, pneumonia, diarrhoea, infectious and parasitic diseases. Infant mortality shows a tendency to increase when maternity takes place repeatedly and in quick succession. All these causes are being remedied.

Besides this, mortality among females of reproductive ages is also high. It ranges between 300-400 per 1,000 women of ages 15-45. Inadequate pre-natal and post-natal care which is the result of poverty and absence of hospital facilities is largely responsible for this. With improvements in diet, hospital and midwifery facilities, it is reasonable to expect that infant and maternal mortalities will register a further decline.

Fevers (including malaria) cholera, small-pox, plague, dysentery and diarrhoea, respiratory diseases, etc., also account for a large number of deaths. Out of these small-pox, plague and cholera have been, by and large, eradicated. With the growth of medical facilities and improvement in living standards, it is hoped that crude death rate will decline considerably.

Thus, over the last 5 decades, both birth and death rates have been declining, but the death rate declined at a faster rate. Death rate has already reached a very low ebb and whatever the level of health facilities, it cannot fall below 7-8 per thousand. The future growth of India's population shall, therefore, be mainly dependent on the level of the birth rate.



TABLE 8. Crude Birth and Death Rates for Selected Countries (2008)

Country	Birth Rate	Death Rate	Infant mortality Rate
Germany	8.3	10.3	4
U.K.	12.9	9.4	5
U.S.A.	14.3	8.1	7
Canada	11.3	7.2	6
France	12.9	8.6	3
Australia	13.8	6.7	5
Japan	8.7	9.1	3
China	12.1	7.1	18
India	22.8	7.4	52

SOURCE : *World Development Indicators (2010)*

It may be noted that states which have achieved death rates below a level of 8 per thousand are incidentally also the states which are moving towards a lower birth rate. The reason being that medical facilities in terms of hospitals, primary health care dispensaries have been established in them. Once the people are assured of the survival of their children, the chances of persuading them to go in for sterilisation also improve. Moreover, the family planning staff can be more effective at the primary health centres in introducing couples to the use of contraceptives and discuss with them the effectivity of the various contraceptive devices as also to get feedback from them about the problems faced by the users. The co-efficient of correlation between death rate and birth rate was as high as +0.67 for the 15 states listed in Table 3.

Correlation co-efficient between infant mortality rates and birth rate for 15 major states of India was very high. This underlines the fact that high infant mortality induces couples, more especially among the poor, to have larger family size. Consequently, birth rate are higher in states which have higher infant mortality rates. The analysis underlines the need for enlargement of health facilities so as to reduce infant mortality rates and over-all death rates as a positive measure both of family planning and family welfare.

### Rural-Urban Differentials in Birth and Death Rates

Data provided in Table 9 reveal that death rate in urban India declined from 9.7 per thousand in 1971 to barely 6.3 in 2000, but as against it, death rate in rural India declined from 16.4 per thousand in 1971 to 9.3 in 2000. There is no doubt that the urban areas are the forerunners in the development of medical facilities and control of epidemics and diseases, but these facilities have

TABLE 9: Birth and Death Rate: Rural and Urban Trend

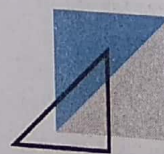
	Rural	Urban	Combined
<b>Birth Rate</b>			
1971	38.9	30.1	36.9
1981	35.6	27.0	33.9
1991	30.9	24.3	29.5
2000	27.6	20.7	25.8
<b>Death Rate</b>			
1971	16.4	9.7	14.9
1981	13.7	7.8	12.5
1991	10.6	7.1	9.8
2000	9.3	6.3	8.5
<b>Infant Mortality Rate</b>			
1971	138	82	129
1981	119	62	110
1991	87	53	80
2000	74	44	68

SOURCE: Registrar General of India on the basis of Sample Registration Data, Tata Services Ltd., *Statistical Outline of India (2003-04)*.

also been extended to rural areas. Consequently the urban rural differentials have got reduced from 6.7 in 1971 to just 3.0 in 2000. This is a very healthy development.

However, the situation in infant mortality rate (IMR) is not so optimistic. There has been a sharp decline in urban IMR from 82 per 1,000 live births in 1971 to 44 in 2000. But as against it, the rural IMR declined from 138 to 74. The IMR gap between rural and urban areas was 56 in 1971 and it came down to 32 in 2000. It is still quite large. This is due to the prevalence of high poverty ratios in rural areas as against those in than in urban areas.

So far as birth rates are concerned, they have shown a decline from 30.1 per thousand in 1971 to 20.7 in urban areas, but in rural areas, they have declined from 38.9 to 27.6. The rural and urban birth rate gap has got reduced from 8.8 in 1971 to just 6.9 in 2000. Obviously, family planning programmes have to target the rural areas in a much more effective manner so that birth rate in rural areas can be brought down at an accelerated pace.



### 3. QUANTITATIVE POPULATION GROWTH DIFFERENTIALS IN DIFFERENT COUNTRIES

Population growth rates are different in different parts of the world. Taking the world as a whole, the total population on this planet was 3,696 million in 1970, it rose to 4,426 million in 1980 and stood at 6,438 million in 2005. The annual compound rate of growth during