A Study on Demographic Transition Theory of Bangladesh

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Research Article

ABSTRACT

It is known to all Bangladesh as a developing country. In this study trying to know the demographic transition stage of Bangladesh using different demographic variable such that birth rate, death rate, population growth rate etc. In this regard demographic transition model will be used to know the demographic transition stage of Bangladesh. After completing this research study conclude that Bangladesh is within the 2nd stage based on the demographic transition model and Bangladesh demographic variables (1981-2018).

INTRODUCTION

In starting of late 1700, death rate of whole world initiated fewer in size because of so many different reasons for example advances in agriculture nomenclature, betterment of health sector in worldwide, amelioration of sanitation system, teenaged society are exist in that time, and growing of older age people etc. This variation makes relevance between BR and DR. Applying this familiarity between BR and DR, best demographic scientist revealed a model called demographic transition model, in short DTM. They have employed five stages [1]. And then one country will go existing one stage to next stage because of different causes. In starting of 18th century, large numbers of countries in worldwide are in stage I or pre-transition stage because of no industrial revolution in that time. With changing time in the mid of 20th century most of the countries of the world are not only come in stage II but also stage III, stage IV and stage V. There are different countries in stage II especially least developing countries i.e, Afghanistan, Bangladesh, Guatemala, Nauru, Palestine, Sub-Saharan Africa and Yemen. Due to economic, social and political permanency some countries are drive into in stage III especially developing countries i.e, Botswana, Colombia, India, Jamaica, Kenya, Mexico, South Africa, and the United Arab Emirates. For some different improvement in different sectors some countries are go into in stage IV especially developed countries i.e, Argentina, Australia, Brazil, Canada, China, most of Europe, Singapore, South Korea, and the U.S. Recently there are different countries in stage V where population growth rate is negative i.e, Croatia, Estonia, Germany, Greece, Japan, Portugal and Ukraine. A country's population growth rate will be low if birth rate and death rate are high or low. Because of women's entering in every sector such as government job sector, private sector, agriculture sector, political sector, industrialized sector etc. women's are becoming busy, as a result birth rate is being low [2].

In economics a greater part of profit are converted into per capita income through demographic transition using manufacturing improvement. It increases labor and growth through three ways. For instance, at first alternation of

the increasing store of capital and infrastructure will be decreased due to decrease in population. Second, concentrate on fertility reduction so that every child's will be made as a human capital and labor productivity. Third, declining fertility reduction, population age and composition, increasing labor force of population will be employed to increase productivity per capita [3]. The world demographic transition has acquired significant variation, rearranging population and revamping the economic and demographic life cycles. In the third world countries many economists unrecognized of the speedy population growth which would confine economic improvement. Economist said that about 50% populations will be increase over this century where world environmentalist declares that already world's population is outbreak of the biosphere [4]. Increasing growth rate as a result of transition from high BR and DR too low BR and DR would constitute greater population in the ending time than starting time [5]. According to data of Bangladesh (1901-2011), Bangladesh has been followed demographic transition model. During 1901-2021 Bangladesh lay within stage I. In stage I BR and DR was high and GR was less than 1% per year. Stage II started in 1920 and till at mid-1790. In Stage II DR was decreasing but BR was remaining at high level and mortality rate was decreasing and fertility rate was stable until for 50 years and GR was 2.7% per year. In the early 1970 birth rate started to decline and lie within stage III. Since the annual growth rate was about 1.4 percent within the period 2001-2011 transition remains incomplete. Since 1971 overall mortality of Bangladesh has decreased and then life expectancy has increased and decrease population GR.

The main issue of this study is in which demographic transition stages Bangladesh lies in this period (1981-2018). To know the demographic transition stages of Bangladesh, a demographic transition model will be used which has already developed. This model helps to explain in which stages world's countries are considered considering demographic variable among five stages. It can be known whether a country is economically developed or not through population growth rate cycles [6].

Methods and Materials

The demographic transition model will be used to complete this research. The model will be described one to five stages with respect to Bangladesh.

Stage I

Since BR and DR are high so PGR will be zero in this stage. There are so many causes of increasing birth rates i.e. since increasing production in the agricultural sector so society depends on it, most of the family members know that increasing number of children means creating large workforce. Since a country wants to achieve replacement level so it tries to increase high birth rate and high death rate simultaneously. Demographers point out some causes to high death rates through deeper analysis such as infant mortality and life expectancy. Due to insufficient medical facilities, sanitation and public health, infant mortality was high and life expectancy was low. Death rate varies from year to year. Harvest system of the agricultural sector was very low and prices of every grain were very high. As a result famine and other disasters were seen in any country. Each and every person suffered from malnutrition and poor health status [7-10].

Stage II

In stage II, death rates will start falling and birth rates will be high like the first stage. As a result there is a rapid population growth known as population explosion. Because of high birth rates comparative to low death rate total population of any country will be increased [11]. There are so many reasons of death rate declining i.e. development of health sector, quick medical facilities, improvement of pediatric care, standardization of education system, technological improvement of food production etc.

Stage III

In this stage death rates continue to decrease at a lower speed and birth rate gradually started decreasing. PGR will be continued at a very smaller rate until BR replaces to below replacement level. Economic development, increasing women empowerment in the economic sector and education sector and using female contraceptive technology reflect a combination of forces including urbanization, education. The decline in birth rate is dependent on the economic and social factors [12]. When education and gender equality are achieved in areas, the faster birth rates decline. Education is also important for women as a result family size will be small and ultimately a decrease in birth rate. Education is also important for women to be small family size and decrease in birth rate. Additionally, educated women and working women all time wants to keep small family and do not want to take more children.

Stage IV

In this stage population will be stable due to low BR and DR and these are not constant. According to DTM, Stage IV is known as ideal stage because PGR is decreased gradually [13]. There are different reasons of stabilizing the population i.e. economic development, feasibility of education system, improvement in health sector, women's empowerment, migration system developing area to developed area etc.

Stage V

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In this stage the birth rate is less than the death rate as a result PGR will be negative. According to Population momentum one country will take two or more generation to be negative growth rate. Due to use of 100% family contraception family size will be small. City life style is also important cause of decreasing birth rate to below replacement level. Country to country varies fertility rates because of many biological and political reasons (Table 1).

Table 1. Summary of 1-5 stages based on different demographic variables.

| Different stages							
			Stage one	Stage two	Stage three	Stage four	Stage five
Demographic variables	CBR		BR is high.	BR is high.	BR is gradually started decreasing.	Birth rates are low.	BR is less than DR.
	CDR		Death rate is high.	Death rates will start falling.	Death rates continue to decrease at a lower speed.	Death rates are also low.	DR is high than BR.
	PGR		Population growth will be zero.	Population growth increases, known as population explosion.	Increasing PGR slowly	Stabilizing the population and population will be large.	Life expectancy is increased.

RESULT AND DISCUSSION

The demographic transition
The demographic transition of different data of Bangladesh is presented in Table 2 and Figure 1, which expressed crude birth rates, crude death rates and growth rates over a period of 38 years.

Table 2: Bangladesh CBR, CDR and GR data of (1981-2018) taken from BBS.

Year	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
CBR	34.6	34.8	35	34.8	34.6	34.4	33.3	33.2	33	32.8	31.6	30.8	28.8
CDR	11.5	12.2	12.3	12.3	12	12.1	11.5	11.3	11.3	11.4	11.2	11	10
PGR	2.28	2.25	2.25	2.23	2.25	2.26	2.18	2.19	2.18	2.23	2.18	2.03	1.93
Year	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
CBR	27	26.5	25.6	21	19.9	19.2	19	18.9	20.1	20.9	20.8	20.7	20.6
CDR	9.3	8.7	8.2	5.5	5.1	5.1	4.9	4.8	5.1	5.9	5.8	5.8	5.6
PGR	1.87	1.76	1.76	1.64	1.56	1.48	1.4	1.4	1.5	1.5	1.5	1.49	1.49
Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	
CBR	20.9	20.5	19.4	19.2	19.2	18.9	19	18.9	18.8	18.7	18.5	18.3	
CDR	6.2	6	5.8	5.6	5.5	5.3	5.3	5.2	5.1	5.1	5.1	5	
PGR	1.47	1.45	1.36	1.36	1.37	1.36	1.37	1.37	1.37	1.37	1.37	1.37	

Figure 1. Bangladesh CBR, CDR and GR data of (1981-2018) taken from BBS.
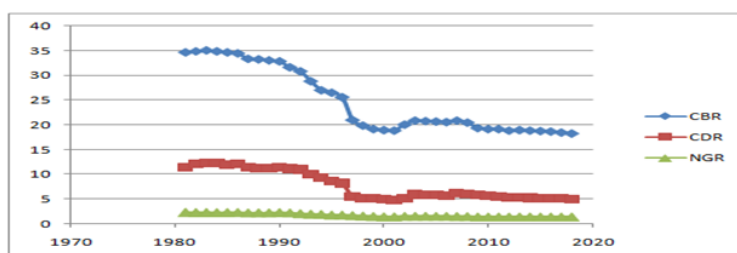
Fertility transition

Among the transition stages of demographic transition theory, in the first stage, the birth rate is so high. In the second stage, birth rate will remain the same as the first stage. In the third stage, birth rate will start gradually decreasing. In the fourth stage, birth rate is very low and slowly decreasing. In the 5th stage BR is less than DR (Table 3 and Figure 2).

Table 3. Bangladesh CBR data of (1981-2018) taken from BBS.

Year	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
CBR	34.6	34.8	35	34.8	34.6	34.4	33.3	33.2	33	32.8	31.6	30.8	28.8
Year	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
CBR	27	26.5	25.6	21	19.9	19.2	19	18.9	20.1	20.9	20.8	20.7	20.6
Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	
CBR	20.9	20.5	19.4	19.2	19.2	18.9	19	18.9	18.8	18.7	18.5	18.3	

Figure 2. Bangladesh CBR data of (1981-2018) taken from BBS.
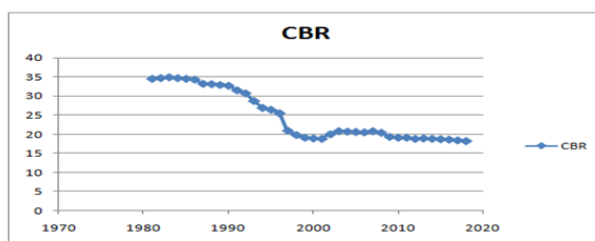
According to the Bangladesh CBR data of (1981-2018) taken from BBS, it may be concluded that in 1981 to 1990, the CBR of Bangladesh was high which lies between (34.6-32.8). The difference is 1.8. In 1991 to 2000, CBR of Bangladesh was also high but started decreasing which lies between (31.6-19.0). The difference is 12.6. In 2001 to 2010, CBR of Bangladesh was also high but started decreasing which lies between (18.9-19.2). The difference is -0.3. In 2011 to 2018, CBR of Bangladesh is also high but started decreasing which lies between (19.2-18.3). The difference is 0.9. The above information showed that in 1981 to 1990 CBR is slowly decreasing and 1991 to 2000 decreasing rate of CBR is so high and 2001 to 2010 decreasing rate of CBR is negative and 2011 to 2018 decreasing rate of CBR is also slow [13]. According to data, from the four decades of Bangladesh concluding that still now crude birth rate is so high.
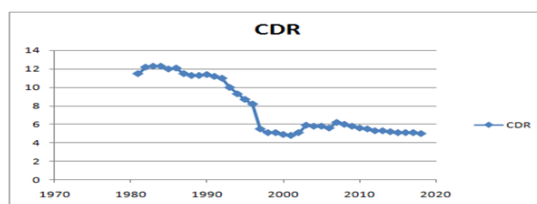
Mortality Transition

Among the transition stages of demographic transition theory, in the first stage, BR and DR are increasing equally, as a result population growth rate is zero. In the second stage, since birth rate is so high and death rate started decreasing gradually, so population growth rate will be positive. In the third stage, birth rate and death rate are decreasing equally; as a result population growth is also zero. In the 4th stage birth rate and death rate are decreasing as a same rate but decreasing rate is very low, as a result growth rate is zero or may be negative. In the 5th stage, birth rate is very low compared to the death rate. In this stage population growth rate will be negative [14] (Table 4 and Figure 3).

Table 4. Bangladesh CDR data of (1981-2018) taken from BBS.

Year	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
CBR	34.6	34.8	35	34.8	34.6	34.4	33.3	33.2	33	32.8
CDR	11.5	12.2	12.3	12.3	12	12.1	11.5	11.3	11.3	11.4
PGR	2.28	2.25	2.25	2.23	2.25	2.26	2.18	2.19	2.18	2.23

Figure 3. Bangladesh CDR data of (1981-2018) taken from BBS.

Growth rate transition

Among the transition stages of demographic transition theory, in the first stage, BR and DR are increasing equally, as a result population growth rate is zero. In the second stage, since birth rate is so high and death rate started decreasing gradually, so population growth rate will be positive. In the third stage, birth rate and death rate are decreasing equally; as a result population growth is also zero. In the 4th stage birth rate and death rate are decreasing as a same rate but decreasing rate is very low, as a result growth rate is zero or may be negative. In the 5th stage, birth rate is very low compared to the death rate. In this stage population growth rate will be negative.

According to the Bangladesh CDR data of (1981-2018) taken from BBS, may be concluded that in 1981 to 1990, CDR of Bangladesh was high which lies between (11.5-11.4). The difference is 0.1. In 1991 to 2000, CDR of Bangladesh was also high but started decreasing which lies between (11.2-4.9). The difference is 6.3. In 2001 to 2010, CDR of Bangladesh was also high but started decreasing which lies between (4.8-5.6). The difference is -0.8. In 2011 to 2018, CDR of Bangladesh is also high but started decreasing which lies between (19.2-18.3). The difference is 0.5. The above information showed that in 1981 to 1990 CDR is slowly decreasing and 1991 to 2000 decreasing rate of CDR is so high and 2001 to 2010 decreasing rate of CBR is negative and 2011 to 2018 decreasing rate of CBR is also slow. According to data, from the four decades of Bangladesh concluding that crude death rate is high and consequently gradually decreasing. In 1981 CBR=34.6, CDR=11.5 and PGR=2.28, so Bangladesh lies within stage 2. In 1982 CBR=34.8, CDR=12.2 and PGR=2.25, so Bangladesh lies within stage 2. In 1983 CBR=35.0, CDR=12.3 and PGR=2.25, so Bangladesh lies within stage 2. In 1984 CBR=34.8, CDR=12.3 and PGR=2.23, so Bangladesh lies within stage 2. In 1985 CBR=34.6, CDR=12.0 and PGR=2.25, so Bangladesh lies within stage 2. In 1986 CBR=34.4, CDR=12.1 and PGR=2.26, so Bangladesh lies within stage 2. In 1987 CBR= 33.3, CDR=11.5 and PGR=2.18, so Bangladesh lies within stage 2. In 1988 CBR=33.2, CDR=11.3 and PGR=2.19, so Bangladesh lies within stage 2. In 1989 CBR=33.0, CDR=11.3 and PGR=2.18, so Bangladesh lies within stage 2. In 1990 CBR=32.8, CDR=11.4 and PGR=2.23, so Bangladesh lies within stage 2. According to the demographic transition model in the 1st and 3rd stage population growth rate is zero but in the 2nd stage there is a positive population growth rate and population growth rate is also high. In the 4th stage CBR and CDR is very low and population growth is also low. In the 5th stage since CDR is higher than CBR so population growth rate is negative. So conclude that in the last ten years (1981-1990) Bangladesh lies on the second stage based on the demographic transition model (Table 5).

Table 5. Bangladesh PGR data of (1991-2000) taken from BBS.

Year	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
CBR	31.6	30.8	28.8	27	26.5	25.6	21	19.9	19.2	19
CDR	11.2	11	10	9.3	8.7	8.2	5.5	5.1	5.1	4.9
PGR	2.18	2.03	1.93	1.87	1.76	1.76	1.64	1.56	1.48	1.4

In 1991 CBR=31.6, CDR=11.2 and PGR=2.18, so Bangladesh lies within stage 2. In 1992 CBR=30.8, CDR=11.0 and PGR=2.03, so Bangladesh lies within stage 2. In 1993 CBR=28.8, CDR=10.0 and PGR=1.93, so Bangladesh lies within stage 2. In 1994 CBR=27.0, CDR=9.3 and PGR=1.87, so Bangladesh lies within stage 2. In 1995 CBR= 26.5, CDR=8.7 and PGR=1.76, so Bangladesh lies within stage 2. In 1996 CBR=25.6, CDR=8.2 and PGR=1.76, so Bangladesh lies within stage 2. In 1997 CBR=21.0, CDR=5.5 and PGR=1.64, so Bangladesh lies within stage 2. In 1998 CBR=19.9, CDR=5.1 and PGR=1.56, so Bangladesh lies within stage 2. In 1999 CBR=19.2, CDR=5.1 and PGR=1.48, so Bangladesh lies within stage 2. In 2000 CBR=19.0, CDR=4.9 and PGR=1.40, so Bangladesh lies within stage 2. In 1991-2000, Although CBR, CDR and PGR is gradually decreasing, so concluding that Bangladesh lies on the second stage because based on demographic transition model in the 1st and 3rd stage population growth

rate is zero but in this case there is a positive population growth rate and population growth rate is also high. In the 4th stage CBR and CDR is very low and population growth is also low. In the 5th stage since CDR is higher than CBR so population growth rate is negative. So conclude that in the last ten years (1991-2000) Bangladesh lies on the second stage (Table 6).

Table 6. Bangladesh PGR data of (2001-2010) taken from BBS.

| Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
CBR	18.9	20.1	20.9	20.8	20.7	20.6	20.9	20.5	19.4	19.2
CDR	4.8	5.1	5.9	5.8	5.8	5.6	6.2	6	5.8	5.6
PGR	1.4	1.5	1.5	1.5	1.49	1.49	1.47	1.45	1.36	1.36

In 2001 CBR=18.9, CDR=4.8 and PGR=1.40, so Bangladesh lies within stage 2. In 2002 CBR=20.1, CDR=5.1 and PGR=1.50, so Bangladesh lies within stage 2. In 2003 CBR=20.9, CDR=5.9 and PGR =1.50, so Bangladesh lies within stage 2. In 2004 CBR=20.8, CDR=5.8 and PGR=1.50, so Bangladesh lies within stage 2. In 2005 CBR= 20.7, CDR=5.8 and PGR=1.49, so Bangladesh lies within stage 2. In 2006 CBR=20.6, CDR=5.6 and PGR=1.49, so Bangladesh lies within stage 2. In 2007 CBR=20.9, CDR=6.2 and PGR=1.47, so Bangladesh lies within stage 2. In 2008 CBR=20.5, CDR=6.0 and PGR=1.45, so Bangladesh lies within stage 2. In 2009 CBR=19.4, CDR=5.8 and PGR=1.36, so Bangladesh lies within stage 2. In 2010 CBR=19.2, CDR=5.6 and PGR=1.36, so Bangladesh lies within stage 2. In 2001-2010, the CBR and the CDR and consequently population growth rate is very slow and difference is also very low. So concluding that Bangladesh lies on the second stage because based on the demographic transition model in the 1st and 3rd stage population growth rate is zero but in the 2nd stage there is a positive population growth rate and population growth rate is also high. In the 4th stage CBR and CDR is very low and population growth is also low. In the 5th stage since CDR is higher than CBR so population growth rate is negative. So conclude that in the last ten years (1991-2000) Bangladesh lies on the second stage (Table 7).

Table 7. Bangladesh PGR data of (2011-2018) taken from BBS.

Year	2011	2012	2013	2014	2015	2016	2017	2018
CBR	19.2	18.9	19	18.9	18.8	18.7	18.5	18.3
CDR	5.5	5.3	5.3	5.2	5.1	5.1	5.1	5
PGR	1.37	1.36	1.37	1.37	1.37	1.37	1.37	1.37

In 2011 CBR=19.2, CDR=5.5 and PGR=1.37, so Bangladesh lies within stage 2. In 2012 CBR=18.9, CDR=5.3 and PGR=1.36, so Bangladesh lies within stage 2. In 2013 CBR=19.0, CDR=5.3 and PGR=1.37, so Bangladesh lies within stage 2. In 2014 CBR=18.9, CDR=5.2 and PGR=1.37, so Bangladesh lies within stage 2. In 2015 CBR=18.8, CDR = 5.1 and PGR=1.37, so Bangladesh lies within stage 2. In 2016 CBR=18.7, CDR=5.1 and PGR=1.37, so Bangladesh lies within stage 2. In 2017 CBR=18.5, CDR=5.1 and PGR=1.37, so Bangladesh lies within stage 2. In 2018 CBR=18.3, CDR=5.0 and PGR=1.37, so Bangladesh lies within stage 2. In 2011-2018, the CBR and the CDR and consequently population growth rate is very slow that means nearly constant and difference is near about zero. So concluding that Bangladesh lies on the second stage because based on the demographic transition model in the 1st and 3rd stage population growth rate is zero but there is a positive population growth rate and population growth rate is also high. In the 4th stage CBR and CDR is very low and population growth is also low. In the 5th stage since CDR is higher than CBR so population growth rate is negative (Figure 4).

Figure 4. Bangladesh NGR data of (1981-2018) taken from BBS.
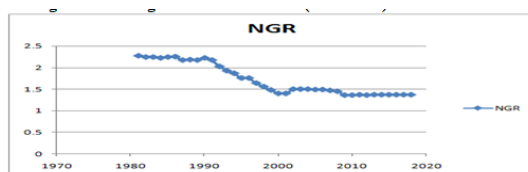
CONCLUSION

To analyze the demographic transition model with respect to Bangladesh at first I use fertility transition, mortality transition and growth rate transition. Individual year wise transitions are also analyzed in the growth rate transition.

According to the Bangladesh CBR data of (1981-2018) taken from BBS, it may be concluded that, in 1981 to 1990, the CBR of Bangladesh was high and slowly decreasing. In 1991 to 2000, the CBR of Bangladesh was also high but started decreasing and the decreasing rate is so high. In 2001 to 2010, the CBR of Bangladesh was also high but started decreasing and the decreasing rate is negative. In 2011 to 2018, the CBR of Bangladesh is also high but the decreasing rate is slow. So from the four decades of Bangladesh still now crude birth rate is so high. Based on the Bangladesh CDR data of (1981-2018) taken from BBS, it may be concluded that in 1981 to 1990, CDR of Bangladesh was high and slowly decreasing. In 1991 to 2000, CDR of Bangladesh was also high and decreasing. In 2001 to 2010, CDR of Bangladesh was also high and negative. In 2011 to 2018, CDR of Bangladesh is also high but started decreasing and decreasing rate of CBR is also slow. According to data, from the four decades of Bangladesh concluding that crude death rate is high and consequently gradually decreasing. According to the demographic transition model in the 1st and 3rd stage population growth rate is zero but in the 2nd stage there is a positive population growth rate and population growth rate is also high. In the 4th stage CBR and CDR is very low and population growth is also low. In the 5th stage since CDR is higher than CBR so population growth rate is negative. So conclude that in the last ten years (1981-1990) Bangladesh lies on the second stage. In 1991-2000, Although CBR, CDR and PGR were gradually decreasing, concluding that Bangladesh lies on the second stage based on demographic transition model. In 2001-2010, the CBR and the CDR and consequently population growth rate is very slow and difference is also very low. So conclude that Bangladesh lies on the second stage. In 2011-2018, the CBR and the CDR and consequently PGR are very slow that means nearly constant and difference is near about zero. So conclude that Bangladesh lies on the second stage. Hence finally it may be said that using the demographic transition model Bangladesh is still now staying in stage two.

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