Analysis of Achievement of Selected MDGs: A Comparative Study between India and Bangladesh

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The paper focuses on the relative achievement of five major Millennium Development Goals (MDGs) for India and Bangladesh. This is done by constructing indices with the help of the UNDP goal-post method and Principal Component Analysis (PCA) technique. From the analysis, it is revealed that these two countries have more or less successfully performed to bring about positive reforms in the case of hunger alleviation, the progress of primary education, improvement in child and maternal health, establishing better environment against sex discrepancy, etc. It also identifies the policies and programmes set by the two countries for the attainment of the respective goals. The paper shows that though these two developing nations performed quite satisfactorily to deal with deprivation afflicted issues and address the prevailing status of socio-economic malaises, the achievements were sometimes not continuous and marked by undulations.

Keywords: Health, Analysis of Education, Nutrition, Mortality, Child Care, Gender Equality

JEL Classification: I12, I21, J13

I. INTRODUCTION

The world leaders of the different nations signed the United Nations Millennium Declaration on 8th September 2000 in New York and some fundamental critical issues, such as right to education, health issues, freedom and equality, dignity, etc., were emphasized there. The Millennium Development Goals (MDGs) set concrete targets and indicators, reflecting poverty reduction, the expansion of primary education, improvement of maternal and child health, gender equality, etc., that were outlined in the declaration to achieve the targets by 31

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December 2015. The goals were set mostly for the developing countries. In the beginning, 189 United Nations member-states (there are 193 currently), and at least 23 international organisations, got committed to assisting the achievement of the MDGs by 2015.

There are two main forces for attaining MDG-related development outcomes:(i) economic growth and (ii) the implementation of sound policies and institutions that facilitate targeting effective service delivery to the poor. The eight goals are eradication of extreme poverty and hunger, achievement of universal primary education, promotion of gender equality, reduction of child mortality, improvement in maternal health, combating HIV/AIDS, malaria and other diseases, ensuring environmental sustainability, and development of a global partnership for development. These goals are supposed to be extremely important, from the point of view of developing countries of the world, for countries that are afflicted with the aforesaid problems. Unfortunately, due to weak economic conditions and the absence of proper government strategies, the poor countries failed to implement the MDG project successfully till 2004-05. But to help these countries to get on the right track for meeting the goals, some major global policies were introduced in 2005. Among these, the most important is the World Summit agreement, signed in 2005, in which every country became committed to adopting its national strategy to achieve the MDG by 2015. With the end of the year 2015, it seems imperative to assess the progress with respect to the attainment of the goals in some of the developing countries in South Asia.

Due to consistent data availability over the period 1990-2015, focus has been put on this paper to assess the comparative changes in the post-MDG and pre-MDG period in two countries, India and Bangladesh. Apart from this, as around 1.37 billion people of South Asia reside in India, India's achievement in respect of any of the goals brings South Asia, as a whole, a step closer towards regional goal attainment. Bangladesh, despite its current high level of poverty, has been singled out as having the potential to become one of the world's growing economies with a high level of population. In this perspective, the objective of this paper is to focus on comparative performance between India and Bangladesh with respect to achievement across only the first five goals outlined above. The prime purpose is to focus mainly on the basic needs of people, e.g., food, education, and health-related issues. These five goals are also related to human capability improvement. Continuous year-wise data on malaria, AIDS/HIV were not available in world bank data set corresponding to these two countries. As a result, the sixth goal had been left out of consideration. Further, since the goals relating to environmental

sustainability and global partnership are not so strongly linked with capability enhancement, these were not considered in the analysis. Again, we consider those indicators which seem to be most intensely related to the target of the considered goals and for which there exist continuous data over the years.

Focus on Indicators in the Chosen Goals of MDG

1   Chosen Indicators for the first goal include (i) depth of the food deficit (kilocalories per person per day), and (ii) percentage of undernourished population.

2   Chosen Indicator with respect to the second goal is primary gross enrolment ratio, combining both sexes (per cent).

3   With regard to the third goal, the indicators include (i) ratio of female to male primary enrolment (per cent), (ii) ratio of female to male secondary enrolment (per cent), (iii) ratio of female to male labour force participation rate (per cent) (modelled ILO estimate), and (iv) seats held by women in national parliament (percentage).

4   Chosen indicators for the 4th goal include (i) children (0-14) living with HIV, (ii) Immunization, DPT (per cent of children ages 12-23 months), (iii) immunization, measles (per cent of children ages 12-23 months), (iv) prevalence of anaemia among children (per cent of children under 5), (v) children under-five mortality rate per 1,000 live births, and (vi) proportion of the population using improved sanitation facilities, total.

5   The indicators corresponding to the fifth goal encompass i) adolescent fertility rate (births per 1,000 women ages 15-19, (ii) lifetime risk of maternal death (per cent), and(iii) maternal mortality ratio (modelled estimate, per 100,000 live births).

II.   REVIEW OF LITERATURE

There are quite a number of studies in the years of recent past that reflect on the achievement with respect to the stated MDG goals in the two countries.

In a study related to present health status in Bangladesh, Jahan and Chowdhury (2014) considered the concept of electronic health or e-health, referring to the delivery of health services and information by using the internet and other related technologies in the healthcare industry. This study found that if the travelling cost of a patient involved in visiting a medical specialist is higher than the cost of having e-consultation, then e-Health might be an economically better solution.

According to Urvashi Sahni (2015), India is quite successful in increasing the primary enrolment ratio in the recent period due to various government

programmes. Enrolment rate has reached 98 per cent where girl students' upliftment rate in this section was 56 per cent between 2007 and 2013. A descriptive analysis of the condition of educational structure in Bangladesh had been done by UNICEF Bangladesh (September 2009). For their viewpoint, UNICEF used some statistical data derived from the Annual Sector Performance Report (published in 2009) of the Directorate of Primary Education, 2008. According to UNICEF, there were 16.4 million (7.9 million boys and 8.5 million girls) primary school-aged children (6 to10 years) and among them, net enrolment rate in primary schools was 90.8 per cent. The enrolment rates for boys and girls were respectively 87.9 per cent and 94 per cent. It is a shining example of the improvement in primary education for girl children in society.

According to a case study by Asian Development Bank (2015) on Gender Equality Results in Bangladesh Small and Medium- sized Enterprise Development Project, development and expansion of SMEs were remarkable from 2009 to 2013. But the noticeable thing is that during these years the number of women-owned SMEs had increased by over 10 per cent. The SME projects focused on training SME owner women in business development, accounting, loan application, etc., to further their access to institutional finance.

In a paper related to India's gender equality status, Sankaran and Madhav (2011) have emphasized on recent legal and policy framework in India within which Indian women can achieve a healthier work environment through collective bargaining and social dialogue. Rahman, Parkhurst and Normand (2003) have focused on maternal health and family planning status in Bangladesh. According to them, though the Bangladesh government has put remarkable attention on these issues, the progress rate for maternal health problems remains slow. Maternal health condition is still poorer than desired. The rate of abortion in Bangladesh has increased in the last two decades. They state that the problems persist due to lack of good doctors and better infrastructure, women's ignorance, untrained service provider, unhygienic physical environment, lack of proper nutrition, etc.

According to Rahman (2018), in Bangladesh infant mortality, child mortality and under-five mortality have declined two times, six times and three times, respectively, compared to the last two decades, but, unfortunately, the maternal mortality rate has not declined up to the mark. Usmani and Ahmad (2017) focused on the health condition of Indian children based on nutrition and rate of survival. According to them, though malnutrition has reduced over time, there still exist a huge number of malnourished children in India.

III. METHODOLOGY

Data Sources and Tools Applied

This analysis is completely based on secondary data which are taken from the website of the World Bank statistical data set about MDGs on the UNDP site (2015). For comparability, we cover the time span 1990 to 2015 and develop five indices, namely Freedom from Hunger Index (FHI), Education Index (EI), Gender Equality Index (GEI), Child Health Index (CHI), and Maternal Health Index (MHI). All the variables are taken into account from the standpoint of a positive view towards improvement. The values of these indices will reflect the intensity of improvement or the position of a particular country towards the path of fulfilling the desired goal. The components under each considered goal have been combined to form an index (as stated above) using a principal component analysis (PCA). Before applying the PCA method, the UNDP Goal-Post method has been employed for the normalization of the data.

UNDP Goal-post Method

There are great differences across the values of the different indicators over the years. In order to ensure better comparability of these data, each indicator has been "normalised" using the UNDP goal-post method as used for measuring the initial international HDI. This is as follows:

$$X_i = \frac{(x_i - x_{min})}{(x_{max} - x_{min})}$$

where X_i is the normalised indicator for year i, x_i is the corresponding pre-normalisation figure, and x_{max} and x_{min} are the maximum and minimum values of the same indicator across all years. The normalised indicator takes value 1 at the top of the level of achievement, and 0 indicates the bottom of the scale, i.e., implies the highest level of deprivation for all the individual categories of indicator; it varies between 0 and 1 for all the years.

Principal Component Analysis (PCA)

(i) Principal component method has wide application in social analysis. It involves the construction of a new set of a smaller number of variables (P_i) out of a relatively larger set of variables (X_js). Its computation is conditioned by certain assumptions: There should be multiple variables measurable at continuous level (although ordinal variables are very frequently used).

(ii) There needs to be a linear relationship between all variables.

(iii) sampling adequacy is needed, i.e., for producing a reliable result, large enough sample sizes are required.

(iv) There should not be any major outliers.

(v) PCA assumes data standardization before its application. Without the use of standardized data, PCA will not be able to find the optimal Principal Component.

PCA helps in solving the problem of multicollinearity and in constructing data driven weighting index. If we consider the status on the health of children, preparing an overall health-related index of children on the basis of the principal component method requires the consideration of diverse individual categories of achievement. The overall health index is considered a latent or unobserved variable. Here the problem is the weight assigned to the individual indicators, which is critical to maximizing the information from a data set included in an index. A good composite index should comprise important information from all the indicators, but not be strongly biased towards one or more of these indicators.

For expositional convenience, we choose the construction of child health index through application of PCA. We consider the Child Health Index linearly determined by six relevant components. The indicators are children (0-14 yrs) living with HIV (Z_{1i}); immunization, DPT (per cent of children aged 12-23 months) (Z_{2i}); immunization, measles (per cent of children aged 12-23 months) (Z_{3i}); children under-five mortality rate per 1,000 live births (Z_{4i}); prevalence of anaemia among children (per cent of children under 5) (Z_{5i}); and improved sanitation facility within the premises (Z_{6i}). For having comparability with positive indicators of achievement, indicators having negative implications are expressed by using the formula as

$$X_i = \frac{(x_{max} - x_i)}{(x_{max} - x_{min})}$$

In latent form, the health index can be expressed as:

$$D_i = \delta_1 Z_{1i} + \delta_2 Z_{2i} + \delta_3 Z_{3i} + \delta_4 Z_{4i} + \delta_5 Z_{5i} + \delta_6 Z_{6i} + w_i$$

(where i= 1 to 26)

We denote λ_j (j= 1, 2, 3, 4, 5, 6) as the jth Eigen-value. Subscript j refers to the number of Principal Components that also coincides with the number of corresponding indicators. Noting that the values of λ_j gradually fall as the suffix

increases; we denote P_j ($j = 1, 2 \ldots \ldots 6$) as the jth Principal Component. We get the corresponding child health index according to the following weighted average:

$$D_i = \frac{\sum_{j=1}^{6} \lambda_j P_j}{\sum_{j=1}^{6} \lambda_j}$$

A similar method is applied for constructing other indices like Freedom from Hunger Index, Gender Equality Index, Maternal Health Index, etc.

However, the applicability of PCA is made limited by certain (tacit) assumptions. In particular, PCA can capture linear correlations between the features but fails when this assumption is violated. Further, in the case of differences in the application of the data standardization method, there may be variations in its result. Yet, still, some widely accepted method of data standardization is warranted before its application.

Spline Function Analysis

In order to reflect on the comparative success rate regarding achievement of the goals between the post-MDG and pre-MDG period, it is thought suitable to divide the data (wherever available) over two time periods 1990-2004 (pre-MDG) and 2005-2015 (MDG). The growth rate of respective indices over these two periods is computed by applying the spline function approach. Spline functions are formed by joining polynomials together at fixed points called knots. Assuming a linear time trend, the postulated model would be

Period 1 $y_t = \alpha_1 + \beta_1 t + u_t$, $t \leq a$

Period 2 $y_t = \alpha_2 + \beta_2 t + u_t$, $a < t$ (1)

For analysis, in this case, we take the origin of time to be 1990. Here $a = 15$ (i.e., 2004). The data might be split into two distinct subsets, and two separate time trends are estimated. w_{1t} and w_{2t} indicate the modified time periods based on the assumption of some intermediate year as the join time point. The linear spline function may be fitted in two alternative fashions. One is to define the following variables:

$w_{1t} = t$

$w_{2t} = 0$ if $t \leq a$

     $= t-a$ if $a < t$

And reparameterize the function as

$y_t = \alpha_1 + \delta_1 w_{1t} + \delta_2 w_{2t} + u_t$ (2)

Comparing Eqs. (1) and (2), it is easy to see that $\beta_1 = \delta_1$, $\beta_2 = \delta_1 + \delta_2$.

Apart from this, the moving average technique has been applied for the fitting trend of the computed index values, which is reflected in the respective figures.

IV. RESULTS AND DISCUSSION

A Study on Freedom from Hunger Index

In order to have a comparative assessment of the goals achieved by India and Bangladesh, the aforesaid indices (excepting education index which is based on only one indicator) have been constructed based on PCA and the five-year moving average values of Freedom from Hunger Index (FHI), and other indices, i.e., Gender Equality Index (GEI), Child Health Index (CHI) and Maternal Health Index (MHI) over the years 1992 to 2013, which have been presented in Table I for purposes of convenience in comparison. Higher the values, higher are the level of improvement towards the fulfilment of goal, and vice-versa, i.e., Indicator takes value 1 at the top level of achievement, while 0 indicates the bottom of the scale.

TABLE I
5-YEARLY MOVING AVERAGE VALUES OF INDEX FOR THE TWO SAARC COUNTRIES

Year	Freedom from Hunger Index		Gender equality index		Child Health Index		Maternal Health Index	
	India	Bangladesh	India	Bangladesh	India	Bangladesh	India	Bangladesh
1990	-	-	-	-	-	-	-	-
1991	-	-	-	-	-	-	-	-
1992	0.110	0.214	-0.024	0.617	0.070	0.009	0.163	0.218
1993	0.137	0.195	0.035	0.722	0.158	0.099	0.245	0.320
1994	0.186	0.174	0.076	0.721	0.307	0.159	0.327	0.415
1995	0.298	0.139	0.116	0.732	0.401	0.247	0.412	0.508
1996	0.434	0.166	0.145	0.735	0.456	0.299	0.496	0.595
1997	0.601	0.258	0.187	0.742	0.465	0.326	0.581	0.678
1998	0.773	0.410	0.241	0.753	0.448	0.397	0.666	0.758
1999	0.909	0.600	0.289	0.771	0.462	0.493	0.752	0.835
2000	0.968	0.801	0.334	0.774	0.516	0.566	0.836	0.909
2001	0.936	0.966	0.411	0.776	0.607	0.655	0.918	0.983
2002	0.825	1.094	0.466	0.766	0.733	0.775	0.998	1.054
2003	0.672	1.181	0.508	0.756	0.833	0.898	1.076	1.123
2004	0.531	1.234	0.556	0.775	0.974	0.991	1.150	1.190
2005	0.469	1.266	0.613	0.783	1.089	1.108	1.222	1.252
2006	0.510	1.284	0.664	0.806	1.221	1.225	1.289	1.312
2007	0.645	1.291	0.740	0.827	1.317	1.306	1.352	1.368
2008	0.833	1.290	0.845	0.889	1.431	1.387	1.411	1.423
2009	1.023	1.284	0.952	0.916	1.507	1.492	1.465	1.474
2010	1.178	1.277	1.056	0.963	1.607	1.589	1.516	1.522
2011	1.277	1.272	1.141	1.007	1.644	1.672	1.563	1.568
2012	1.330	1.273	1.205	1.020	1.678	1.740	1.607	1.610
2013	1.343	1.297	1.254	1.026	1.710	1.792	1.648	1.650
2014	-	-	-	-	-	-	-	-
2015	-	-	-	-	-	-	-	-

Source: Author's calculation using the World Bank dataset (2015).

The first focus is put on the aspects of success in removing hunger from society. No doubt poverty is a curse on society and it is the main cause of hunger, health related problems, and illiteracy. So, the first goal of MDG is to eradicate extreme poverty and hunger from society. Hunger implies the condition when a person is incapable of taking a sufficient amount of food (consumption of 1,800 kilocalories a day) for meeting his basic nutritional requirement. Food deficiency is mainly the problem of developing countries. According to the UN Food and Agriculture Organization (FAO), since the year 2006, the food price had risen more or less continuously up to 2011. In 2008, the price of rice became too high, mostly in developing countries. Side by side, there was a worldwide financial crisis in 2008. As a result, many people had suffered from the global food crisis. After 2011, the condition became somewhat hopeful for the poor.

Analysis of Variation of FHI

Table I reveals that India achieved a good improvement on the hunger score, rising from 0.110 to 0.968 from 1992 to 2000. *A higher score represents better performance.* However, between 2000 and 2005, scores have declined from 0.968 to 0.469. Again, during the period 2006 to 2013, India has experienced sustained growth in moving average value towards the goal. On the other hand, in the case of Bangladesh, after 1992 till 1995, the rate of progress has slowed down. But after that, from 1996 to 2013, five-year moving average values had a positive rate of growth. Based on an of analysis of the overall moving average chart of Bangladesh, it is evident that the country has become able to overcome one of the basic problems like food scarcity. The overall moving average index values increased from 0.214 in 1992 to 1.297 in 2013. We can also have a comparative analysis of five-year moving average values of the index for the countries over the years on the basis of the figure below.

The comparison is done based on the moving average values of FHI from the year 1992 to 2013. The red line indicates the level of improvement of India, while the green line stands for Bangladesh. Figure 1 reveals that India's performance has been quite dramatic with upswings and downswings. The comparative graphical exposition shows that the performance of Bangladesh has been better than India between 1992 to 1994 and 2001 to 2010. But since 2011, due to various government initiatives in favour of hunger alleviation, India has started superseding Bangladesh.

Figure 1: **Five Year Moving Average Values of FHI**
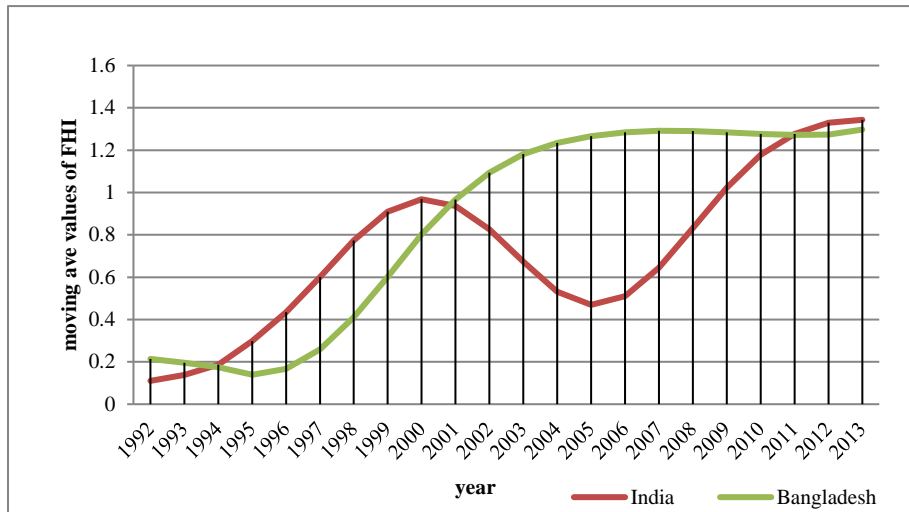
Analysis of Spline Function

Let us consider the spline function of the Freedom from Hunger index for the two countries. We sub-divided the total span of time into two parts: β_1 implies the growth rate for the period 1990 to 2004 and β_2 represents the same for the period 2005 to 2015.

TABLE II

SPLINE FUNCTION RESULT ON FREEDOM FROM HUNGER INDEX

Dependent Variable: Freedom from Hunger Index		
Country Name	India	Bangladesh
Independent Variable	Coefficient	Coefficient
(Constant)	0.116 (0.809)	-0.201**(-2.196)
w_{1t}	0.041***(2.925)	0.092***(10.170)
w_{2t}	0.020(0.690)	-0.077***(-4.094)

Source: Author's own calculation.

Note: 1. t-values are in parentheses. 2. *** and ** indicate the 1% and 5% level of significance respectively.

Case of India: $\beta_1 = \delta_1 = 0.041$, $\beta_2 = \delta_1 + \delta_2 = 0.041+0.020 = 0.061$, $\beta_2 - \beta_1 = 0.02$, $\beta_2 > \beta_1$

Case of Bangladesh: $\beta_1 = \delta_1 = 0.092$, $\beta_2 = \delta_1 + \delta_2 = 0.092 + (-0.077) = 0.015$, $\beta_2 - \beta_1 = -0.077$, $\beta_2 < \beta_1$

From Table II, it appeared that the rate of improvement towards the reduction of severity of hunger is greater during the MDG period than the pre-MDG period in India. in the case of Bangladesh, though improvement has occurred in both pre- and-post-MDG periods, the extent of improvement between 1990 and 2004 (β_1 =0.092) is greater than the post-implementation period.

Hunger Project, based on the largest volunteer-based organised activity, has been launched in Bangladesh since 1990. It has worked wonders in many fields linked with hunger alleviation and people empowerment. According to Akhter Ahmed, IFPRI Senior Research Fellow and Chief of Party of the PRSSP, past success in Bangladesh has been possible through coordinated investments in agriculture, with well-functioning institutions, policy restructuring, social safety net programmes, and market-linked incentives to achieve food security. But the emergence of the food crisis in 2007 in Bangladesh has led to a price hike that led to a fall in real wages affecting access to food.

Government Intervention in Favour of Hunger Alleviation

According to the UN report, in 1990-92, the number of starved people in India was 210.1 million, which came down to 194.6 million in 2014-15. The Indian government has taken various projects like 'National Food for Work Programme' (2004) to intensify the generation of supplementary wage employment, 'Mid-Day meal' scheme to provide children proper nutritious food in school for preventing problems of school dropout, 'Integrated Child Development Services' (ICDS) programme for kids under the age of six and for pregnant and nursing mothers, 'MGNREGA' Scheme (2006) to provide at least 100 days wage employment in rural areas, and Public Distribution System (PDS) to make available essential consumer goods to the consumers at subsidized prices.

For reducing poverty and hunger, both government and non-government organisations have been implementing various programmes relating to income generation and upliftment of the poor in Bangladesh. According to the World Bank report (Dhaka, June 20, 2013), Bangladesh has made a significant improvement in lowering poverty from 2000 to 2010. Despite a mounting population, the number of poor people decreased by 26 per cent over 10 years. Poverty declined by 1.7 percentage points per annum. The series of shocks that affected Bangladesh in 2007 and 2008 did not significantly slow down the speed of poverty reduction. Some important programmes, among others, are Food for Work, Vulnerable Group Development (VGD),Vulnerable Group Feeding (VGD), Test Relief (TR), Gratuitous Relief (GR), Poverty Alleviation and Micro-credit Programmes undertaken by the Department of Fisheries, Programme for generating employment for the unemployed youth by the Karmasangsthan Bank, etc.

However, the volatility in food prices since the food crisis in 2007 posed a challenge towards maintaining seasonal and temporal stability in food security. Farmers faced increasing challenges with regard to continuity in access to resources and services, untoward fluctuations in weather due to climate change, and lack of arable land (FAO 2016, World Bank 2016). With 50 million people still reeling under poverty, Bangladesh faces the daunting task of providing adequate incentives to various small producers, together with maintaining food prices low for poor people. In the case of India, major challenges are faced in implementing social protection programmes like PDS (public distribution system),which is a price-support-cum-consumer subsidy programme and aims at improving food security among the poor.

Analysis of Educational Index

A comparative analysis of primary educational achievement in these two SAARC countries has been considered below. In this paper, we consider the gross primary enrolment ratio for both sexes as an indicator of education and applying the UNDP Goal-post method on this indicator, we get the "Educational Index." It is important to note that only in respect of gross enrolment ratio, continuous data are available since 2000. In terms of other possible variables (viz, public expenses on education, teacher-pupil ratio), continuous data are not available for either of the countries.

TABLE III
VALUES OF EDUCATIONAL INDEX

Year	India	Bangladesh
2000	0.010	0.000
2001	0.000	0.059
2002	0.037	0.119
2003	0.519	0.181
2004	0.965	0.243
2005	0.960	0.408
2006	0.955	0.438
2007	0.960	0.406
2008	1.000	0.321
2009	0.921	0.453
2010	0.897	0.572
2011	0.848	0.950
2012	0.932	0.780
2013	0.983	0.852
2014	0.914	0.925
2015	0.909	1.000

Source: Author's calculation based on World Bank data.
Note: The UNDP process of forming the respective indicator values related to primary gross enrolment for both sexes (%) is such that higher index values reflect a higher level of achievement towards the goal and lower index values show a higher level of deprivation, i.e., Indicator takes value 1 at the top level of achievement,while 0 indicates the bottom of the scale.

The blue and red lines in Figure 2 show the gross primary enrolment ratios in India and Bangladesh, respectively. Table III reveals that in the year 2001 the primary education condition was the worst for both countries. But after this, up to 2015, they have achieved positive values towards 1, although there were continuous ups and downs. The comparison shows that in the year 2001-02 Bangladesh exceeded India. But from 2003 to 2010, India's achievement was faster than that of Bangladesh. From 2002 to 2004, a massive improvement has occurred in India. In the Figure 2 below we get a stiff upward rising straight line over these three years. The education achievement was highest in 2008 in India. According to Census of India (2011), the rise in literacy rate in males and females in India during 2001-11 was of the order of 6.9 and 11.8 per cent respectively, supporting a tendency of upward movement of youth literacy. However, in the year 2011, the condition suddenly improved in the case of Bangladesh and even during 2014 and 2015, i.e., till the ending period of UN's Millennium Development Goal, Bangladesh exhibited a better position than that of India.

During the 6th Five Year Plan (2011-15) in Bangladesh, significant efforts were made to improve the achievement with respect to education consistent with MDG goals. This was strengthened by the enunciation of education policy 2010 that proposed to raise compulsory primary education to grade 8 by 2018. It is notable that during primary education development programme (PEDP), 2011-16, support was extended to every government primary school (GPS) with a primary class, for introducing one-year of pre-primary education before school entry. Based on government and non-government Organisation's (GO-NGO) collaborative effort, an operational guideline was developed to promote this endeavour. A significantachievement was recorded in respect of enrolment, reaching 97 per cent in 2013. In addition to the education policy, there were other policies, such as National Child Policy 2011, National Women Development Policy 2011, Comprehensive Early Childhood Care and Development Policy 2013, etc., that strengthened achievement in the education field compared to India in 2011 to 2015.

Policy in Favour of Widening Primary Education

The above analysis shows that both India and Bangladesh are now on the track towards success. The Indian government launched various programmes to reduce the percentage of dropouts, child labour, etc. India is committed to the 'Millennium Development Goal' and 'Education for All'. The government decided on the Constitution's 86th Amendment to provide free and compulsory education in the age group of 6-14 years. For ensuring the Right of Children to Free & Compulsory Education, an Act passed in July-August 2009, and it has started its operation on 1 April 2010. Major ongoing programmes are 1. Sarva Shiksha Abhiyan, 2. Mid-Day Meal Scheme 3. Rashtriya Madhyamik Shiksha Abhiyan, 4. Model School

Scheme, 5. Saakshar Bharat/Adult Education, 6. Pradhan Mantri Kaushal Vikas Yojana, etc.

The educational system of Bangladesh is three-tiered and highly supported financially by the government. Education had become compulsory in this nation in 4November 1972. The government promulgated the "Compulsory Primary Education Act 1993" to make the five-year primary education programme free in all primary schools. As a result, it became possible to reach primary education to the door of poor families. The government also adopted a food for education programme and a stipend programme for primary education. According to Bhuyan (2003), Bangladesh seems poised to attain some of the UN millennium development goals, such as universal primary school enrolment and gender parity. The UNDP report (2005) states that Bangladesh can play a role model by revealing the possibility of sustained human development even in poorer countries at a relatively modest level of income growth.

Figure 2: **Values of Educational Index**
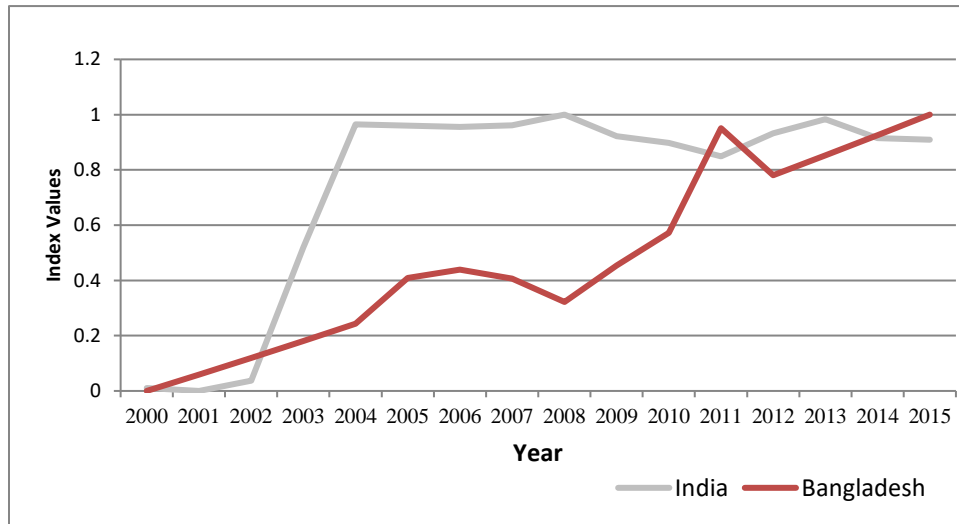
However, despite the shining line in respect of enrolment ratio, the major snag for children in primary schools in Bangladesh is often the inefficient quality of education, which leads to low-learning outcomes and eventually dropouts and so non-completion of school education. Under-qualified and untrained teachers, insufficient infrastructure, poor nutrition and food security standards all impinge on learning outcomes. Teacher supervision, and monitoring and accountability systems need to be strengthened to sustain the tempo of the improved education profile of the country.

Thus, basic education still confronts challenges in the sense of furnishing quality, range and contribution to social-economic equality. The quality of education needs to be addressed by recruiting better-qualified teachers with good salaries. The dropout rate also needs to be redressed. Further, there is a system of NGO-run non-formal primary schools different from other non-government private primary schools. The informal approach of the first type schools targeted to children of poor section far differs from the formal pattern of education,which engenders a dichotomous society and widens inequality. The Bangladesh government faces the challenge of introducing a uniform pattern of education for all sections of society that may also help ensure better social stability. In India,major challenges in the primary education sector emerged in the rural areas. Severe challenges exist in the form of a lack of quality teachers with hardly any experience in professional training programmes, lack of adequate infrastructure, and high education costs, especially when there exists a widespread lack of discipline, punctuality and motivation on the part of primary teachers.

Focus on Gender Equality Index

Gender equality, also known as sex equality or gender egalitarianism, is one of the most important human rights. According to UNICEF, gender equality means that "women and men, and girls and boys, enjoy the same rights, resources, opportunities and protections". But year after year, a large section of girls and women in many developing countries of the world have remained underfed, malnourished and ill-treated. Women are victimized not through inequality in social or political right only but also in such areas as the right to education, health, social justice, employment, and salary issue. Even in this twenty-first century, in many developing and less developed countries, a girl child is considered a burden to her family because people prefer the newborn as a boy to a girl. In matters of education, better opportunities are in general provided to the boys. Due to improper attention to their health and well-being, they suffer from malnutrition, under-nutrition, stunting, wasting and underweight. Early marriage, dowry system, sexdiscrimination harassment, sex-selective abortion, high maternal mortality, and sexual abuse are the other problems that women face.

According to USAID, gender equality and women's empowerment is a part of the core of the development of a society. Every nation has to remember that today's girl is the asset and creator of tomorrow's human capital. They must have equal rights and equal opportunities. To analyse the development towards the desired goal of gender equality, we have derived an index named Gender Equality Index (GEI). In constructing this index, we considered four indicators. These are (i) ratio

of female to male primary enrolment (%), (ii) ratio of female to male secondary enrolment (%), (iii) seats held by women in national parliament, percentage, and (iv) ratio of female to male labour force participation rate (%) (modelled ILO estimate). The indicator relating to the ratio of female to male labour force participation considers all the three broad sectors, including primary, secondary and tertiary sectors. These comprise agriculture, fisheries, mining, manufacturing,utility, construction, trade, hotel and restaurant, transport, storage and communications, finance & business community, social, personal services, etc., covering both public and private sector. Further, primary and secondary education is financed by the state government and all students enjoy free schooling facilities in any public school in both Bangladesh and India. The tertiary level of education is conducted by various universities and colleges, which is not free of charge. Hence, often students back out from education after secondary level. So, we want to consider the basic education which is affordable for all, however, despite that there may be differential across male-female enrolment. The UNDP process of forming the respective indicator values related to gender equality is such that higher index values reflect a higher level of achievement towards the goal. In contrast, lower index values show a higher level of deprivation, i.e., Indicator takes value 1 at the top level of the achievement; on the other hand, 0 indicates the bottom of the scale.

Analysis of Variation in Index

Analysing the 5-year moving average values presented in Table I, it is evident that from 1992 to 2013, GEI values of both the countries have increased continuously. In 1992, the moving average value was 0.024 and 0.617, whereas, in 2013, it was 1.254 and 1.026 respectively for India and Bangladesh. So, in Bangladesh, there occurred marginal improvement in favour of gender equality from 1992 to 2013. Both countries experienced a rising upward trend (Figure 3). India slightly outperformed Bangladesh since 2008. There have been severe fluctuations (with a sudden dip in one period and a rise in the next) in Bangladesh in respect of both female and male primary and secondary enrolments over 2008-2015, while India experienced a steady rise. In addition, primary enrolment figures were lower than those in India during 2013-15. Again, in Bangladesh, women accounted for only 6.3 per cent of seats of parliament. It was 9.1 per cent for India. These factors slightly favoured India during 2008-15, based on considered indicators.

Figure 3: **Five Year Moving Average Values of GEI**
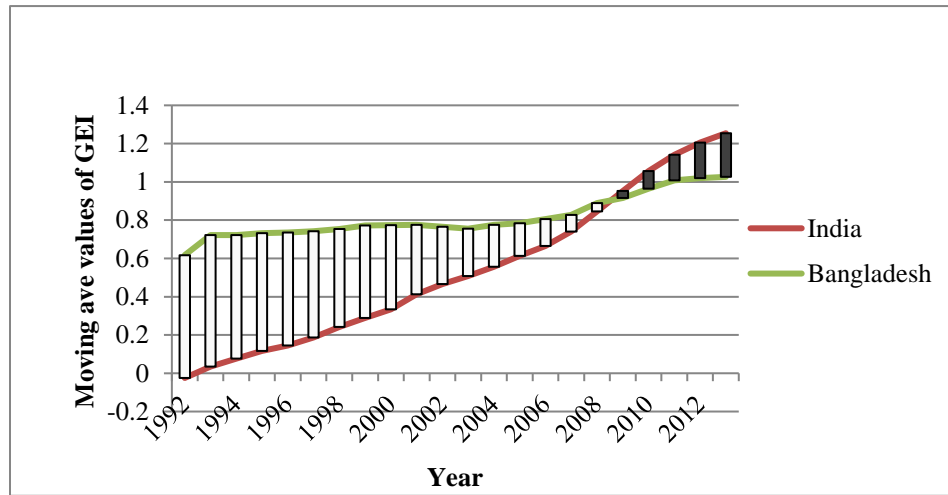
Case of Spline Function

We sub-divided the total span of the period into two parts. β_1 implies the growth rate from 1990 to 2004, while β_2 represents the growth rate from 2005 to 2015.

TABLE IV
ANALYSIS OF SPLINE FUNCTION

Dependent Variable: Gender Equality Index		
Country Name	India	Bangladesh
Independent Variable	Coefficient	Coefficient
(Constant)	-0.180***(-6.713)	0.585(9.910)
w_{1t}	0.048***(18.139)	0.015**(2.530)
w_{2t}	0.031***(5.548)	0.008(0.657)

Source: Author's calculation.

Note: 1. t-values are in parentheses. 2. *** and ** indicate the 1% and 5% level of significance respectively.

Case of India: $\beta_1 = \delta_1 = 0.048$, $\beta_2 = \delta_1 + \delta_2 = 0.048 + 0.031 = 0.079$, $\beta_2 - \beta_1 = 0.031$, $\beta_2 > \beta_1$

Case of Bangladesh: $\beta_1 = \delta_1 = 0.015$, $\beta_2 = \delta_1 + \delta_2 = 0.015 + 0.008 = 0.023$, $\beta_2 - \beta_1 = 0.008$, $\beta_2 > \beta_1$

The result of spline functions for both countries indicates that the rate of improvement in gender equality is faster in 2005 to 2015 than 1990 to 2004 period.

Programmes Undertaken by the Government in Favour of Gender Equality

The Government of India has taken various programmes in favour of female self-dependency. Among these programmes, Rashtriya Mahila Kosh or National Women Fund (established on 30 March 1993), to make provisions for credit support to the poor women for their future development in socioeconomic status, and Kasturba Gandhi Balika Vidyalaya (launched in July 2004), to facilitate residential schools at upper primary level for the students of SC, ST, OBC and minority communities, are notable. This scheme merged with Sarva Shiksha Abhiyan on April 1 2007; further, there is SABALA or Rajeev Gandhi Scheme for Empowerment of Adolescent Girls (age group 11-18 years). Other schemes like Mahila Samridhi Yojana, Indira Mahila Yojana, National Mission for Empowerment of Women, National Programme for Education of Girls at Elementary Level, and Beti Bachao Beti Padhao (launched on 22 January 2015) are also important.

The Bangladesh government introduced the National Policy for Women's Advancement (1997) for promoting equality of women and men, National Strategy for Accelerated Poverty Reduction or NSAPR-II for women's rights and fights for their survival against poverty, microcredit system, and policy interventions for building schools for primary and secondary education of girls and women, and the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW). Growth in the garment industry also helped in the promotion of women empowerment. The government also established training academies like Women's Agricultural Training Institute, handicraft training centre, and safe hostels for working women.

Despite substantial improvements in the female enrolment rate in India since the 1990s, there still prevails the challenge of imparting enhanced quality education to females. Further, reducing corruption and weak implementation of rights-based legislations such as the Mahatma Gandhi National Rural Employment Guarantee Act, the Forest Rights Act, and Panchayat Extension to Scheduled Areas remain priority areas for government. Apart from this, institutional challenges remain in respect of shifting women out of segmented labour market participation.

In the case of Bangladesh, the challenges consist of enhancing the participation of women in the formal economic sector, which is still poor. Further, institutional bottlenecks prevail in respect of increasing women's business literacy for promoting their part in the economy. Increasing provision for women work participation should focus on broadening options to work, choice of sector, location, and working hours. They faced challenges in enhancing their political participation because of their inadequate socio-

economic mobility, family restriction, institutional and cultural barrier, lack of time for public life, etc.

Variation in Child Health Index

Children constitute the future productive human asset of society. Unless their intelligence, cognitive capacity and physical health are maintained well, their capacity to contribute to society cannot materialise. The physical and mental health of children needs to be carefully nourished and this can contribute to the enhancement of their capability and access to better educational facilities and productivity. Table 1 shows the 5-year moving average values of CHI over the period 1992 to 2013. The higher the value, the higher will be the level of improvement towards the fulfilment of goal and vice-versa.

Analysis of Variation in Index

Table I shows that India improved slowly but surely from 1992 to 2013 with minor undulations in the intervening years. In 1992, the moving average value was 0.07, and in 2013, it became 1.71. Table I also shows that there was continuous improvement in child health in Bangladesh. If we consider the moving average values of the CHI, we get an unremitting positive trend from 1992 to 2013. In 1992, the moving average value was 0.009, and in 2013, the value was 1.792. During this period, the progress occurred continuously at an increasing rate. It implies a fruitful up-gradation towards the child health improvement goal of MDG.

If we compare the child health condition in both these countries, it is seen from Figure 4 that during the period 1993 to 1998, India's condition was better than that of Bangladesh. Both nations experienced the same index value in 1999. But the index values in the case of India have slightly fallen compared to Bangladesh during the period 2000 to 2003. A few ups and downs are seen in the next few periods for both countries. From 2011, Bangladesh has exceeded India, and this situation prevailed till 2015.

Since the Sixth Plan in Bangladesh, stress is being put on improving service delivery in the areas of child health, nutrition, sanitation and water supply, with strengthened public-private sector partnerships in selected areas. It has been possible due to the launching of several vital healthpolicies in recent years, including a National Child Health Strategy integrating water/sanitation, child protection, removal of HIV/AIDS, Early Childhood Care, and quality improvement interventions. Strategic policy-oriented directions for newborn health care have begun to be provided by the National Neonatal Health Strategy and Guidelines 2009, as well as the Health, Population and Nutrition Sectoral Development Plan 2011-2016 (HPNSDP); Children's Policy 2011; National

Policy for Immunisation together with Comprehensive Early Childhood Care and Development Policy 2013. Termination of child labour and child marriage, vindicating child-sensitive social safeguard measures also contributed towards better child health-related achievement. The United Nations also conferred on Bangladesh its MDG Award for lessening child mortality.

FIGURE 4: **Five Year Moving Average Values of CHI**
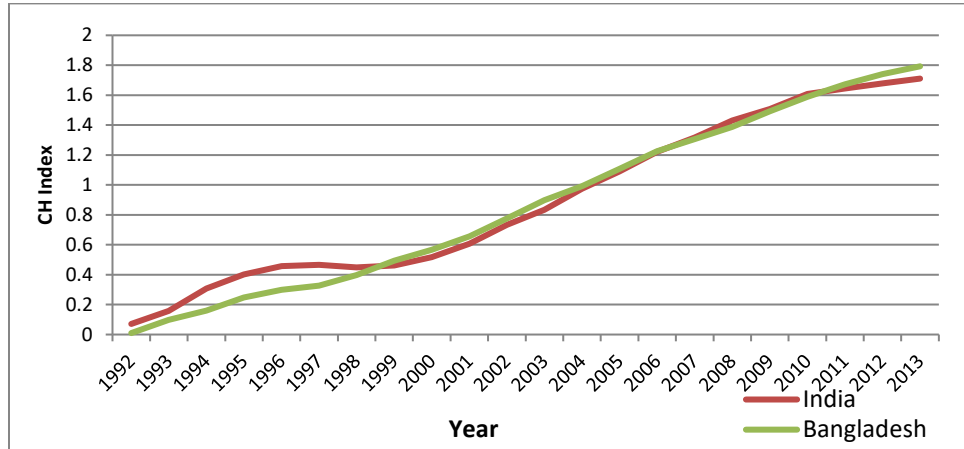
Spline Function Analysis

In the spline function, β_1 implies the growth rate for the period 1990 to 2004, while β_2 represents the growth rate for 2005 to 2015.

TABLE V
SPLINE FUNCTION RESULT

Country Name	India	Bangladesh
	Dependent Variable: Child Health Index.	
Independent Variable	Coefficient	Coefficient
(Constant)	-0.148*(-1.710)	-0.296***(-6.811)
w_{1t}	0.074**(8.687)	0.086***(19.889)
w_{2t}	0.013(0.729)	0.005(0.577)

Source: Author's calculation.

Note: 1. t-values are in parentheses. 2. *** and ** indicate the 1% and 5% level of significance respectively.

Case of India: $\beta_1 = \gamma_1 = 0.074$, $\beta_2 = \gamma_1 + \gamma_2 = 0.087$, $\beta_2 - \beta_2 = 0.013$, $\beta_2 > \beta_1$

Case of Bangladesh: $\beta_1 = \delta_1 = 0.086$, $\beta_2 = \delta_1 + \delta_2 = 0.086 + 0.005 = 0.091$, $\beta_2 - \beta_1 = 0.005$, $\beta_2 > \beta_1$

The result of the spline function exhibits the progress of both India and Bangladesh towards the successful implementation of the goal, i.e., the improvement rate is higher from 2005 to 2015 compared to 1990 to 2004. It is a good sign for the subcontinent's overall development.

Schemes Undertaken in Favour of Child Health

The Ministry of Women and Child Development of India has executed several schemes deciding the norms of child nutrition. These are (i) *National Nutrition Policy* (1993) for eradicating malnutrition and achieving optimum nutrition for all, (ii) *National Plan of Action for Children* for improving the nutritional status of children, reducing infant mortality rate, increasing enrolment ratio, reducing dropout rates, universalisation of primary education, and increasing coverage for immunization, and (iii) Other Schemes include**:** Central Adoption Resource Agency (CARA), Facility Based Newborn and Child Care, Janani Shishu Suraksha Karyakram (JSSK), Facility Based Integrated Management of Neonatal and Childhood Illness, Home Based New Born Care, Navjat Shishu Suraksha Karyakram, Infant and Young Child Feeding, Reduction in Morbidity and Mortality due to Acute Respiratory Infections (ARI) and Diarrhoeal Diseases, Supplementation with micronutrients, etc. For the last few decades, the Ministry of Health and Family Welfare of Bangladesh has implemented several programmes. These centrally controlled services focused on single issues, such as the control of diarrhoeal diseases (CDD) and acute respiratory infections (ARI). The government has launched several nutritional programmes like FFW, TR, FFE, GR, VGD, etc.

However, several challenges remain to overcome in respect of the child health conditions in Bangladesh. In rural areas, the victims of adverse weather conditions (floods, natural disasters, etc.) have to compromise often with the food and nutrition security of children. Again, adequate efforts are still lacking in preventing diarrhoea among rural children suffering from a rarity in drinkable water and scarce sanitation facilities. In India, institutional challenges are perceived regarding closing the variation in child health-related achievement across states and coordinating nutrition support programmes at various levels. Converging at all levels (joint Mother and Child Protection Card as an entitlement tool), conducting joint training, raising the capacities of workers and resource centres, establishing nutrition centres, strengthening ICDS, extending the use of ICT, and instituting strong regulatory mechanisms remain major challenges.

Variation of Maternal Health Index

The term "Maternal health" indicates the health condition of a woman during pregnancy, childbirth or prenatal period. Weak maternal health conditions also

affect the health of new-born babies. The UN's "Millennium Development Goals" emphasized the reducing maternal mortality ratio by three quarters between the years 2005 and 2015. To assess the success of the MDG-5 target, an index, called "Maternal Health Index," has already been constructed.

UNDP goal post method has been applied to normalise the values of the component variables in such a manner that the closer the normalised value to 1, the better is maternal health, and closeness towards value 0 implies a move towards its deterioration.

Analysis of Variation in Index

Based on the figures presented in Table I, Figure 5 shows a comparison, based on f MHI, between India and Bangladesh. The red and green lines indicate the moving average values of MHI of India and Bangladesh, respectively.

FIGURE 5: **Five Year Moving Average Values of MHI**
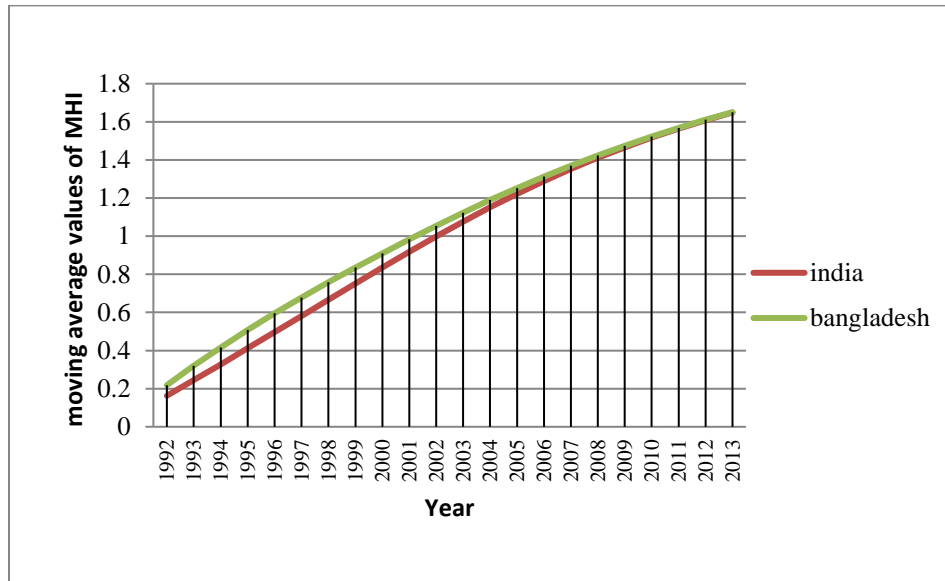
Though it is tough to implement proper health sector reforms in India due to its geographical vastness and socio-cultural diversity, it seems important to note that the maternal mortality ratio has been reduced from 280 in 2005 to 174 in 2015 (from World Bank data). From Table 1I, it is observed that the maternal health index of India has continuously improved over time. It is partly due to a steady decline in MMR. According to Reddy *et al.* (2012), due to favourable maternal mortality reduction efforts in Bihar/Jharkhand (19%), Madhya Pradesh/

Chhattisgarh (11%), and Uttar Pradesh (33%), India was supposed to attain the MDG-5 target by 2015, assuming the sustained pace of linear decline in MMR observed during 1997-2009. The wait may continue till 2023-2024 if there is an exponentially declining trend. From the analysis, it is notable that all 5-year moving average values have increased year after year. The moving average value was 0.163 in 1992, which reached 1.648 in 2013. A higher value indicates a greater level of improvement. On the other hand, over the last 25 years, there has been a continued decline in MMR in Bangladesh also. If we consider the above Table I, it appears that the 5- year moving average values of the MH index are continuously increasing, and if we plot all these values in a graph, we get an upward sloping curve. In 1992, the moving average value of the index was 0.218, whereas the value became 1.650 in 2013. India and Bangladesh are two important south-Asian developing countries. But, undoubtedly, economically and politically, Bangladesh is in a more unstable condition than India. Notwithstanding this, Bangladesh achieved better performance with regard to maternal health index compared to that of India for a considerable period of time during 1992-2007. However, after 2008, both countries witnessed the same track of improvement with respect to this index. Figure 5 shows the comparative analysis of both countries.

Spline Function Analysis

Let us consider the spline function based on MHI values for the years 1990 to 2015 of both countries simultaneously. β_1 implies the growth rate over the period 1990 to 2004, while β_2 indicates the same over 2005 to 2015.

TABLE VI
SPLINE FUNCTION ANALYSIS

Country Name	India	Bangladesh
Independent Variable	Coefficient	Coefficient
(Constant)	-0.094(-11.811)	-0.019(-1.440)
w_{1t}	0.085(107.424)	0.084***(65.635)
w_{2t}	-19.520***-0.032()	-0.037***(-14.124)

Source: Author's calculation. Dependent Variable: Maternal Health Index.
Note: 1. T-values are in parentheses. 2. *** indicates the 1% level of significance.

Case of India: $\beta_1 = \delta_1 = 0.085$, $\beta_2 = \delta_1 + \delta_2 = 0.085 + (-0.032) = 0.053$, $\beta_2 - \beta_1 = -0.032$, $\beta_2 < \beta_1$

Case of Bangladesh: $\beta_1 = \delta_1 = 0.084$, $\beta_2 = \delta_1 + \delta_2 = 0.084 + (-0.037) = 0.047$, $\beta_2 - \beta_1 = -0.037$, $\beta_2 < \beta_1$

According to the spline function for both the countries, the rate of growth of the index values was higher in the pre-MDG period, i.e., between 1990 and 2004, in comparison to the 2005 to 2015 period.

Maternal health care indicators registered consistent progress in India from the publication of the first NFHS in 1992 to the third one in 2006. Institutional deliveries rose from 26 per cent to 39 per cent, and almost half of the women enjoy the benefit of their childbirth attended by skilled health personnel. In 1992, the Government of India launched the Child Survival and Safe Motherhood Program (CSSM) by including in its essentials of safe motherhood interventions. Later (1997-2004), this programme transformed to Reproductive and Child Health (RCH) programme by including some additional elements of care. At the country level, the MMR declined by 54 per cent from 556 (per 100,000 live birth) in 1990 to 254 in 2006. In 2015, it reached 174, registering a decline of only 31per cent since 2006. Thus, the rate of improvement has slowed. Despite the multiple efforts of the Indian government to improve maternal health, the maternal health indicators have not improved significantly in recent past years. Unfortunately, due to lack of administrative and managerial competence and adequate vision about the needed steps and overall programme objectives, the schemes were implemented as an unrelated mix of efforts, and so stopped short of yielding the rate of the desired improvement in the years of recent past. Similarly, the maternal mortality rate in Bangladesh had fallen by 40 per cent, from 551.9 in 1990 to 333.1 in 2003. In 2013, MMR had been estimated at 242.7, registering a fall of 27 per cent from 2003 (Kassebaum *et al.* 2014). The faster rate of decline in MMR in pre MDG period can be attributed to a number of schemes/policies like the female secondary school stipend project (set up in 1994) aiming at the retention of girls at school and delaying marriage and childbearing, Bangladesh Integrated Nutrition Programme (1995-2002), Programmes such as the Maternal Health Voucher Scheme and Emergency Obstetrical Care Services (EmOCs) which were greatly proactive in the initial years.

Schemes Taken by Government in Favour of Maternal Health

The Indian government introduced "Janani Suraksha Yojana" on 12 April 2005 to provide a comprehensive package of obstetric care services including antenatal care, childbirth, and the immediate post-partum period. "VandeMataram" was launched on 9th February 2004, a public-private partnership with the Federation of Obstetric and Gynecological Society of India (FOGSI), with

a view to curtail maternal mortality, improve the health of women during the pregnancy period, and provide free outpatient services, anti-natal check-up and family planning counselling. To provide accessible, affordable and accountable quality health service to people even in the remotest regions, "National Rural Health Mission" was launched on 12th April 2005. "National Programme for Education of Girls at Elementary Level," "Beti Bachao Beti Padhao" programme, etc., are also some of the important initiatives.

Despite confronting several problems, the government in Bangladesh became remarkably successful in achieving fruitful results pertaining to maternal health as embedded in MDG. Various public and private agency funded expenditures have increased in the direction of maternal and child health care. In this respect, the government of Bangladesh started training 3,000 mid-wivessupported by WHO and the UN Population Fund (UNFPA). The government emphasized female education that led to reduced adolescent fertility rate and child mortality. However, achievements in respect of maternal mortality in Bangladesh are mainly quantitative in feature. Qualitative betterment has not been noteworthy. These are due to persisting low-quality care, weak access to services, and nutrition insecurity, which remain as major challenges that often adversely affect maternal health scenarios. Although healthcare plans and policies have been instrumental in promoting quantitative achievements, structural and cultural barriers, lack of better infrastructure, health bureaucracy induced delays, a culture of non-attendance among practitioners, managerial weaknesses and bottlenecks in governance remain to be overcome to attain quality accomplishments. India faces challenges in reducing the variation in maternal mortality across the states. The dearth of trained human resources, especially doctors and supporting nurse midwives, poses a key challenge inachieving better maternal health outcomes. Again, there is a lack of better incentive packages that may be provided to medical personnel working in remote/rural areas.

V. POLICY SUGGESTIONS

Both of these developing countries face multidimensional socio-economic and financial problems in regard to improving the performance of these MDG goals, converted now to SDGs. In order to ensure food security and remove hunger, proper targeting of the poverty-stricken population needs to be made in terms of an efficient public distribution system and focused subsidy on vital nutritional

ingredients. In order to end hunger and malnutrition by 2030 as enshrined in SDGs, policy-oriented steps are required to promote sustainable agricultural practices and provide support to small farmers with equal access to land, machinery and markets.

There is a need for controlling dropouts in school education in both countries. In this context, the government and NGOs should be proactive in removing the menace of child labour and make provisions for extending educational facilities for both sexes equally. Achievement of SDG in this regard requires policy interventions in enhancing the quality of teaching together with tackling issues including gender inequalities, food insecurity, and infrastructure debilities.

The children in these two countries are still suffering from a lack of 100 per cent immunization and nutritional coverage. A policy of financial protection against children health care costs can be floated. Special programmes oriented towards enhancing sanitation, and reducing the intensity of non-communicable diseases, mental health issues, injuries, pollution-related mortality and morbidity as mandated in the SDG, should be undertaken on a larger scale.

The governments should undertake policies that help remove structural, power and political bottlenecks that sustain discrimination against women. The measures may include, among others, removal of discriminating legal frameworks, promotion of equal access to education, implementing policies that promote women's labour force participation, etc. There need to be increased investments for achieving gender equality and female empowerment across all sectors, including education, health, employment, and related areas.

There is a great need for assessing socio-economic and cultural barriers that negatively impact maternal health and exacerbate their nutrition-related mortality, especially in Bangladesh. The government and NGOs need to organise more awareness programmes, and there should be provision for specific funding with appropriate authority oriented towards this job. In line with SDG goals, side by side, there arises the need to make provision of a large number of skilled birth attendants, well equipped medical facilities, good medical staff, nutritional food for anti-natal care in public hospitals, mobile van facilities in rural regions, etc.

VI. CONCLUSIONS

The basic objective of this paper is to have a comparative assessment of the performance of India and Bangladesh pertaining to their achievement with respect to the first five MDG goals.

The core areas thus cover issues like eradication of extreme poverty and hunger, achievement of universal primary education, promotion of gender equality, reduction of child mortality, and improvement in maternal health. The paper focuses on the achievement in respect of the aforesaid goals for India and Bangladesh by constructing indices with the help of the UNDP goal-post method and PCA technique. The achievements are compared between two sub-periods: one covering the pre-MDG years (1990 to 2004) and the other covering the post-MDG years (2005-2015). The growth rate of the indices was computed using the spline function technique. The differential in the growth rate of respective indices across the two countries over these sub-periods has been pointed out, along with possible explanations for the derived differentials. It has been found that the government in both countries has undertaken various schemes/policies towards the achievement of their respective goals.

The key results reveal that these two countries more or less successfully performed in the aforesaid cases. If we go through the first goal of MDGs, we can see that efforts to curtailing the incidences of food shortages have yielded positive results for the two countries. While the rate of growth in FHI in Bangladesh has exceeded that of India in the pre-MDG period, in the post-MDG period, the rate has been comparatively higher in India than the rates in Bangladesh. Based on the upshot of MDG goals, in the SDG strategies, policy-oriented steps need to be taken to promote sustainable agricultural practices and offer support to small-scale farmers with equal access to land, machinery, and markets.

In the sphere of primary education, India achieved faster growth from 2003 to 2010. But from 2011 onwards, Bangladesh surpassed India in this respect due to the simultaneous launching of several programmes, including primary education development programme PEDP, 2011-15, combined GO-NGO effort to strengthen enrolment, the extension of care to mother and child health, etc. But still, the MDG goals remain to be attained in full. Extension to SDG in this regard requires sincere policy implementation in increasing access and improving the quality of teaching and reducing gender discrimination, food insecurity, and infrastructure bottlenecks.

The GEI values of both the countries increased continuously from 1992 to 2013. India's performance in this context slightly surpassed that of Bangladesh after 2008 while before it there was a lag behind. In the case of the child health index, it is observed that during the period 1992 to 1998, India's condition was better than that of Bangladesh; in 1999, they reached the same level while India

receded in position during the period 2000 to 2004. The following years were marked with some ups and downs in India till 2011. After that Bangladesh continued to surpass India till 2015. But still, special programmes should be undertaken for better sanitation, removing the extent of non-communicable diseases, alleviation of physical and mental health-related problems, and reducing mortality and morbidity among children.

The maternal health index of India has continuously improved over time. It is partly due to a steady decline in MMR. Again, over the last 25 years, there has been a continued decline in MMR in Bangladesh too. However, the rate of growth of the MHI values in both countries was higher in the pre-MDG period, between 1990 and 2004, compared to 2005 to 2015 period. In line with SDGs , policy-oriented actions should be taken to make provision of skilled birth attendants and enhanced medical facilities along with good medical staff, nutritional food for anti-natal care in public hospitals, mobile medical vans in rural areas, etc.

The fluctuations in the index values in specific cases in some intermediate years may be attributed to irregularity in movement of some components or lack of implementation of policies in a coherent manner. In sum, despite the end of the period marked for achieving MDGs, many of the goals remain to be attained fully. The unfinished agenda of MDG should be tried to be achieved with emphasis put on the immediacy of wholehearted action.

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