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**The Demographic Dividend: Effects of
Population Change on School
Education in Pakistan**

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ABSTRACT

This study examines how the changing demographics in Pakistan, resulting primarily from fertility transition, would affect educational attainment of school-age population during the next two decades. The basic question addressed is whether the expected population change would enable the country to benefit from the demographic dividend and enhance the chances to achieve universal primary education by 2015, one of the targets of the Millennium Development Goals (MDGs). Using projected population estimates and school enrolment data, the findings show that about 9.5 million children aged 5-9 years were not enrolled in school in 2005-06. Assuming a gradual and steady increase in enrolment, education simulations show that the number of children aged 5-9 years who will never enter school will cumulatively rise to approximately 27.7 million by 2030, of which 12.2 million would be boys, and 15.5 million girls, and it may take another two decades to achieve universal primary enrolment. Furthermore, children aged 10-14 years not attending secondary level were 14.5 million in 2005-06. Given the current trends in enrolment, this number is expected to increase almost four times by 2030, thereby widening the population education gap over the years. Thus rapid increase in enrolment is the desired option. Otherwise the large education deficit would create conditions highly unfavourable to capitalise on the demographic dividend, and pose a threat rather than offer an opportunity to stimulate economic development. In terms of policy actions, investments in school education need to be almost doubled to absorb the prospective increase in the school-age population during the next two decades.

JEL classification: J1, I2, I22

Keywords: Demographic Dividend, Education, Primary Enrolment

1. INTRODUCTION

The process of demographic transition and its likely effects on age distribution of population can have considerable macro-economic and human capital implications for an economy. The effects of this transition operate through a changed age structure characterised by a decline in the proportion of young dependent population with an associated increase in the share of working age population referred to as 'Demographic Bonus'. This situation provides a potential opportunity to boost economic productivity and growth through increased investments in youth population to produce an educated and skilled workforce. Some detailed case studies of East Asia provide empirical evidence that demographic transition contributed significantly to that region's economic growth through its expanded working age population that enhanced the productive capacity, savings and human capital development during the period 1960-1990 [Bloom and Williamson (1998); Deaton and Paxton (2000); Mason (2005)]. Further evidence shows that these countries successfully capitalised on the demographic dividend arising out of their fertility transition by making timely investments in primary and then in secondary education, which resulted in large pool of young and productive labour force ready to be trained for technical and higher education. While the demographic transition provides a window of opportunity for increasing economic growth and prosperity, it does not guarantee it unless accompanied by social and economic policies that allocate sufficient funds and resources to train and make efficient use of human capital. This suggests that appropriate policies are pre-requisites to ensure a consistent and faster decline in fertility along with the enhancement of education and skill level of youth and creation of employment opportunities for the large workforce to reap the benefits of demographic dividend.

Pakistan is undergoing its demographic transition as exhibited by the slowing down of its population growth rate due to declining mortality as far back as the 1950s followed by the decline in fertility in the early 1990s. The death rates declined sharply from about 27 per 1000 population in 1951 to about 11 per 1000 population in 1971, and then to 7.2 in 2005-06, while birth rates remained as high as 45 per 100 population in 1951 to 42 until 1981, resulting in rapid increase in total population for almost three decades. The beginning of fertility transition was marked in early 1990s when the total fertility rate declined from 6.9 children in 1984-85 to 5.4 children in 1990-91 and then to 4.1 children in 2006-07, indicating a drop of about 3 children between 1985 and 2006-07 [PDHS (2006-07)]. The lag between changes in mortality and fertility rates has delayed the process of demographic transition in Pakistan by nearly 2-3 decades compared with many other countries in the Asian region, thereby raising questions about the impact of this transition on the age structure of

population, and the opportunities and challenges that lie ahead to tap the potential human resource in total population. In this situation, it appears important to achieve a sustained decline in fertility to be able to reach replacement level of 2.1 children as documented in Pakistan's population policy (2010-15), that would ultimately reduce the dependency ratio considerably and create an opportunity to benefit from demographic dividend.

Pakistan has experienced a slow paced demographic transition and the age structure of population has apparently large proportions concentrated in school going and working age groups. Population estimates for the year 2009 under the moderate fertility decline scenario show that there are about 40.32 million children aged 5-14 years and about 36 million youth population aged 15-24 years who, together, account for about 45 percent of total population [Population Projections (2009)].¹ It is expected that because of high population growth momentum, the current decline in fertility would reduce school age population very little in the next couple of decades, thereby sustaining the burden on the education system. However, if fertility decline occurs faster and reaches replacement level of 2.1 children by 2020 as documented in Pakistan's Population policy,² the school age population is likely to reduce significantly that may result in making more funds available at aggregate level to invest in primary and higher education levels. At the micro level, lower fertility is also expected to create additional resources in households to keep children in school for longer periods. On the other hand, the proportions at ages 25 years and above relative to its dependent population will increase in the coming decades, thereby expanding the workforce and growth potential created by the transition. Evidence shows that Pakistan's period of demographic dividend began around 1990 and is projected to last until 2045, offering a one-time opportunity to effectively pursue such social and economic policies that ensure sustained growth and continued social investment [Nayab (2007)]. Of particular relevance in this regard are policies and actions related to enhancing investment in education for youth and improving skills of working age population. Failure to bring the largest ever number of young children in schools and make them ready for productive employment will be an opportunity lost to reap the benefits of demographic dividend, thereby aggravating the socio-economic development challenges of the country.

2. PROGRESS IN SCHOOL EDUCATION

The available evidence shows that educational progress in Pakistan has been gradual over the years with younger age cohorts showing higher literacy and

¹These projections are revised population estimates based on the population projections that were earlier prepared by National Institute of Population Studies (NIPS) in 2005. The revised projections take into account the latest evidence of fertility and mortality change at regional and national levels.

²The 2002 population policy of Pakistan has the objective of achieving replacement level fertility of 2.1 children by 2020- a target reflecting much faster fertility decline than observed from past trends.

school participation rates than older ones. Consequently, its literate population has increased from 43 to 65 percent for males and from 22 to 42 percent for females, indicating a rise by 22 and 20 percentage points for males and females since the early 1990s, when fertility also started to fall. Trends in school enrolment as shown in Table 1 indicate that only 56 and 48 percent of boys and girls, respectively, aged 5-9 years are reported attending primary schools in 2005-06—up from previous estimates of 46 and 38 percent in 2001 [PSLM (2005-06); PIHS (2000-01)]. The percentages enrolled in secondary levels among 10-14 years old is 30 for males and 21 for females for the year 2005-06, reflecting large attrition of students at middle and matric levels³ (Table 1). The table further reveals that school participation in primary and secondary education has been much higher in urban than rural areas with a lessening of gender gap over the years. In the year 2005-06, primary level net enrolment rate in urban areas is 66 percent for males and 64 percent for females, indicating minimal gender differentials in schooling due to greater availability of schools in those areas. On the other hand, this gap is large in rural areas with enrolment rate of 53 and 42 percent for males and females, respectively due to shortage of schools and relatively higher poverty levels. Table 1 shows that rural girls have shown notable increase in primary level school enrolment from 31 to 42 percent since 1990-91, their limited ability to continue up to secondary education with a large gender gap is a challenging issue for realising the full potential of demographic dividend.

Table 1

Literacy and Net Enrolment Rates: Pakistan and Urban-Rural Areas, 1990-2005

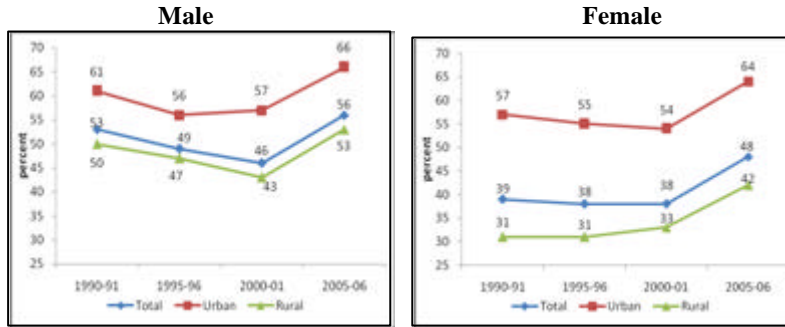
Year	Literacy Rate% (Population 10+)			Net Enrolment Rate (Primary, 5-9 Years)			Net Enrolment Rate (Secondary, 10-14 Years)		
	Male	Female	Gender Gap	Male	Female	Gender Gap	Male	Female	Gender Gap
Total									
1990-91	43	22	21	53	39	14	—	—	—
1995-96	52	26	26	49	38	11	22	12	10
2000-01	58	32	26	46	38	8	25	15	10
2005-06	65	42	23	56	48	8	30	22	8
Urban									
1990-91	61	40	21	61	57	4	—	—	—
1995-96	66	49	17	56	55	1	28	24	4
2000-01	72	56	16	57	54	3	31	26	5
2005-06	79	64	15	66	64	2	35	30	5
Rural									
1990-91	43	12	31	50	31	19	—	—	—
1995-96	45	16	29	47	31	16	12	6	6
2000-01	51	21	30	43	33	10	13	8	5
2005-06	57	31	26	53	42	11	15	10	5

Source: Federal Bureau of Statistics (PIHS, PSLM).

³The combined enrolment rate, measured as the percentage of students aged 5-24 years enrolled in all levels of education has increased from about 36 to 40 for males, and from 19 to 34 for females between 1990-91 and 2005-06, indicating considerable increase in school participation of females during past decade.

The trends of primary level enrolment rates indicate that nearly 50 percent of young boys and girls either remain out of school or leave school before completing primary education, and the bulk of the deficit comes from female and rural population. This means that the improved educational composition of population since the 1990s has not been sufficient enough to make a breakthrough to eliminate gender and urban-rural gaps (Figure 1).

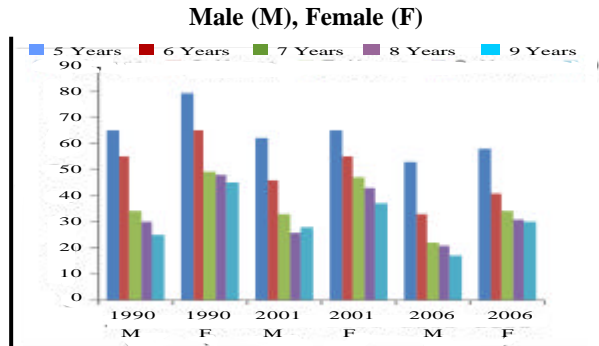
Fig. 1. Trends in Primary Level Net Enrolment Rates, 1990-91 to 2005-06



Source: PIHS, 1990-2001 and PSLM 2005-06.

The pattern of school attendance by age reveals that the proportion of children not in school at ages 5-9 years has shown an improvement since the year 2001 providing evidence of some optimism for future decades. For example, the percentage of 6 year old males not in school reduced from 55 percent in 1990 to about 45 percent in 2006, and correspondingly for females from 65 percent to 43 percent (Figure 2), and this pattern is evident for children of 7, 8 and 9 years old.

Fig. 2. Percentage of Children at Ages 5-9 Not in School, 1990-2006



Source: PIHS, 1990-2001 and PSLM, 2006.

However, a significant proportion of school going age children who never get enrolled is the highest at ages 5 and 6 years, reflecting either no schooling or late entry in schools. Evidence shows that high fertility and large family size, especially in rural households exert negative effects on school enrolment primarily because parents cannot afford to invest in education of their children [Lloyd (1994); Kelly (1996); Lee (2004)]. The challenging issue, therefore, remains of reducing family size as well as the proportions not entering schools to much lower levels to achieve the target of 100 percent primary enrolment. It must be kept in mind that a slow progress in achieving mass schooling is likely to retard the process of fertility decline in Pakistan if viewed in terms of Caldwell's hypothesis that "mass education is an important determinant of the pace and timing of fertility decline" [Caldwell (1980)].

With a significant number of males and females having low educational attainment or no education at all, the chances of getting them absorbed in productive employment and creating conditions to accelerate fertility decline in Pakistan remain limited. This situation calls for making concerted efforts to improve the access and quality of education at primary and secondary levels and to reduce the relative economic and social costs of school attendance, especially for the rural and female youth population.

3. OBJECTIVES OF THE STUDY

This paper examines how changing demographics in Pakistan resulting primarily from fertility transition can affect educational attainment of school going population during the next two decades, allowing the country to benefit from the demographic dividend, and what are the chances to achieve universal primary-level enrolment by 2015, a target of the Millennium Development Goals (MDGs). The specific objectives of the study are:

- (1) estimate population change in age groups of 5-14 years corresponding to primary and secondary educational levels under a set of changing fertility and mortality assumptions for the period 2005-2030;
- (2) project student population to be enrolled at primary and secondary levels education under assumptions of increasing enrolment rates for both levels during 2005-2030; and
- (3) assess the deficit between projected population and enrolment at primary and secondary school going age groups for the period under study.

These results are used to infer how much of the school age population can be translated into educated workforce to realise the full potential of demographic dividend, and to define the policy challenge created by the lag between population change and enrolment growth scenario that would help to initiate appropriate interventions.

4. DATA SOURCE AND METHOD

This study has used population projections by age and sex for Pakistan prepared for the period 1998-2030 [NIPS (2009)] Using the 1998 census data as the base, the projections assume three scenarios of a rapid, moderate, and slow decline in fertility and an improved life expectancy for the period under study. Keeping in view past trends in fertility and mortality, population estimates under the moderate and slow fertility decline seem more realistic and therefore, are used to observe the expected change in school age population in the next two decades. Under moderate scenario, total fertility rate (TFR) is assumed to decline from 4 in 2006-07 to about 3 children in 2015 and then to replacement level of 2.1 in 2030. The slow fertility decline scenario assumes that TFR is likely to fall to 3.5 in 2015 and to 2.6 in 2030.

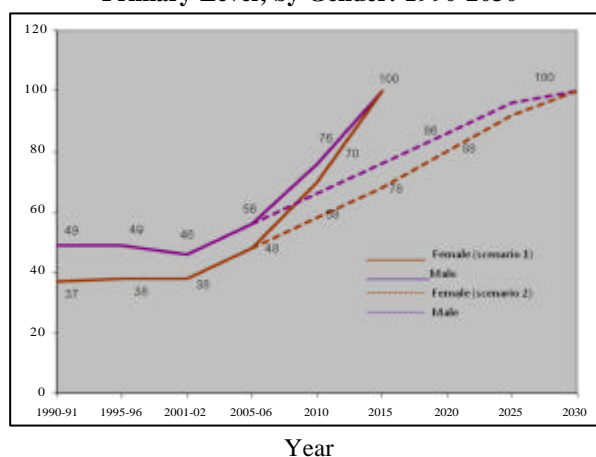
Education simulations for primary and secondary levels by gender are carried out using a set of assumptions based on past enrolment trends evident from the PIHS and PSLM data for the period 1990-91 to 2005-06⁴ [Federal Bureau of Statistics (2007)]. These educational projections are estimated by multiplying the projected population in age groups of 5-9 and 10-14 years by the assumed enrolment rate for primary and secondary levels. The projected school enrolments indicate the future stock of human capital and educated workforce available to contribute to maximising the benefits of demographic dividend.

5. ASSUMPTIONS USED FOR EDUCATION SIMULATIONS

For primary level, two alternative assumption scenarios have been used to yield the results. The *first scenario* reflects an accelerated increase in enrolment and assumes that universal primary level education will be achieved by the year 2015 as targeted in the government policy objective of the MDGs. On the other hand, the *second scenario* follows the past trends in enrolment rates and reflects a gradual increase to achieve 100 percent primary level enrolment by 2030. Figure 1 shows the actual and projected trends in primary level net enrolment rates which indicates that school attendance of children aged 5-9 years need to be doubled within the next five years to achieve the target of MDG, and if present trends continue, it may take another two decades to reach universal primary education (Figure 3).

⁴The educational assumptions reflect the 'Net Enrolment Rates' which assume children participation in school in the officially defined age groups of 5-9 and 10-14 years for primary and secondary levels. The assumptions used are shown in Table 2.

Fig. 3. Actual and Projected Net Enrolment Rates at Primary Level, by Gender: 1990-2030



It is further expected that with the expansion primary level education, there are greater chances of a substantial increase in proportion of population entering secondary and higher levels and a proportional decrease of illiterates in total population in the coming years. It is therefore assumed that under *scenario 1* of a rapid increase in enrolment rate, the proportion of males at ages 10-14 years receiving some secondary education will increase from 30 to 80 percent, and of females from 21 to 70 percent by 2030. These assumptions imply an increase in enrolment rate of approximately two percentage points each year for both males and females during 2005-30. The projected trends in enrolment rates under *scenario 2* assume an increase from 30 to 55 percent for males and from 21 to 45 percent for females indicating a steady improvement by one percentage point each year during the period under study (Table 2).

Table 2

*Assumptions of Net Enrolment Rates for Education Projections:
Primary and Secondary Levels, 2005-2030*

Year	Primary Level (5-9 Years)				Secondary Level (10-14 Years)			
	Scenario 1		Scenario 2		Scenario 1		Scenario 2	
	Male	Female	Male	Female	Male	Female	Male	Female
2005	56	48	56	48	30	21	30	21
2010	76	70	66	58	40	30	35	25
2015	96	92	76	68	50	40	40	30
2020	100	100	86	80	60	50	45	35
2025	100	100	96	92	70	60	50	40
2030	100	100	100	100	80	70	55	45

Author's own Assumptions based on MDG goal of 100 percent primary education by 2015 (scenario 1) and on past trends in enrolment rates (scenario 2).

6. DEMOGRAPHIC DIVIDEND IN PAKISTAN: AN OPPORTUNITY OR A CHALLENGE?

The population projection estimates used to assess the demographic bonus in Pakistan indicate that under moderate fertility decline scenario (TFR of 3 by 2015 and 2.1 by 2030), the number of children under age 15 years will be 60.60 million in 2005 and will change to 65.65 million in 2030 due to gradual decline in fertility and high population growth momentum. However, their percentage share in total population is expected to reduce from 39 to about 27 during the same period, indicating a substantial decline in the proportion of young dependent population.

On the other hand, the likely increase in working age population (aged 15-64 years) will be the largest from 89.82 million to 164.21 million, indicating an increase from 57 percent to about 67 percent of the total population by 2030.

This increase reflects the potential workforce available to be utilised for productive employment and demands expanded opportunities for educational and skill development of growing number of youth population at large⁵ (see Figures 4a and 4b).

Fig. 4a
Pakistan's Prospective Population
by Age:1998-2030
(Millions)

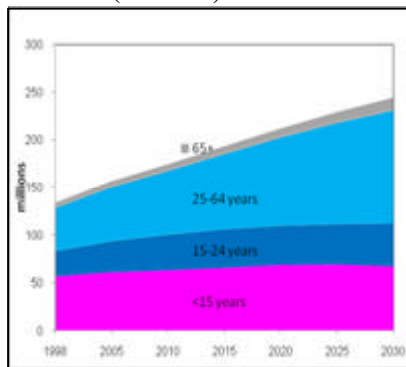
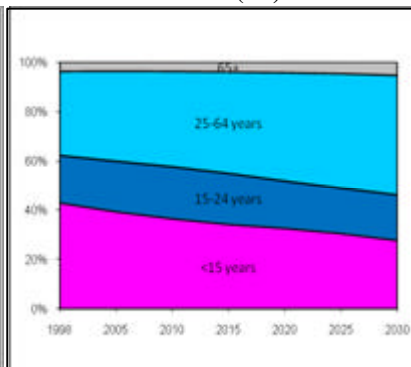


Fig. 4b
Percent Distribution of Population
by Age: 1998-2030
(%)



Source: NIPS, Population Projections, 2009.

The rising number of persons in working age groups also includes the large share of youth population aged 15-24 years who are in need to have above secondary and skilled education, thereby forming the core group of human

⁵An increase in the proportional share of urban workforce aged 15-64 years is expected as a result of reduced dependency ratio due to relatively faster decline in fertility and rising trends in urbanisation in the coming decades, which of course would require enhancement of education and employment opportunities for the growing workforce in urban areas.

capital. The 1998 census data shows a total of about 26.77 million persons in ages 15-24, and this number is projected to increase to about 43.66 million in 2030, indicating an addition of about 16.89million during this period (Table 3). It appears that the baby boom in the eighties as a result of high fertility in the past is now adding to youth population and those available to enter the labour market. It is important to see what proportion of these youth are receiving some level of education or have become part of labour market to earn their livelihood.

Table 3

Youth Population (Aged 15-24 Years) in Pakistan: 1998-2030

Year	Youth Population (15-24 Years)		Youth as % of Working Age Population	% with Completed Secondary plus Education	
	Population (Million)	% of Total		Male	Female
1998	26.77	20.1	36	25	16
2005	32.75	20.9	36	34	25
2010	36.76	21.0	35	–	–
2015	39.14	20.3	33	50	40
2020	40.25	19.1	30	–	–
2025	42.17	18.5	28	65	55
2030	43.66	17.9	27	70	60

Source: Population Census of Pakistan (1998), and Population Projections (2009).

Table 3 shows that youth population (15-24 years) constitutes nearly 36 percent of working age population (15-64 years) in 2005. Of these, 34 percent of males and 25 percent of females have completed secondary and above levels of education in 2005. The projected rising number of youth population from about 32.75 million in 2005 to 43.66 million by 2030 poses opportunities and challenges for development. The opportunities lie in the economy's capacity to equip its young people with human and physical capital and absorb them into productive employment, while the challenges lie in terms of initiating specific programmes and investments that ensure enhanced opportunities for education, skill development, and employment which will also contribute to decline in fertility to lower levels in the coming decades.

7. EDUCATION PROJECTIONS

1. Universal Primary Education Scenario

Achieving universal primary education and closing the gender gap appear to be high priority policy goals in terms of reaping the benefits of demographic dividend. Based on net enrolment rate⁶ (NER) for primary level, only 56 of boys

⁶Net enrolment rate is the proportion of 5-9 years old children attending grades 1-5 and considered the appropriate age for attending primary level. It is considered more precise than the gross enrolment rate as it omits the number of overage children (25-30 percent) attending primary schools, especially in rural and poor areas.

and 48 percent of girls are reported attending primary schools in 2005-06. Translating these figures in total enrolment, the estimates show that under moderate fertility decline scenario, 5.77 million were enrolled of the 10.3 million male population aged 5-9 years, leaving 4.64 million out of school. Correspondingly, of the 9.66 million females aged 5-9 years, about 5 million were enrolled with 4.66 million remaining out of school. If taken together, about 9.5 million children 5-9 years of age were not enrolled in school in 2005-06. This large backlog of 'out of school' children remains a serious constraint to maximising the benefits of demographic bonus (Table 4).

Table 4
*Estimated Enrolments and Out-of-School Population at
Primary Level, by Gender: 2005-2030*

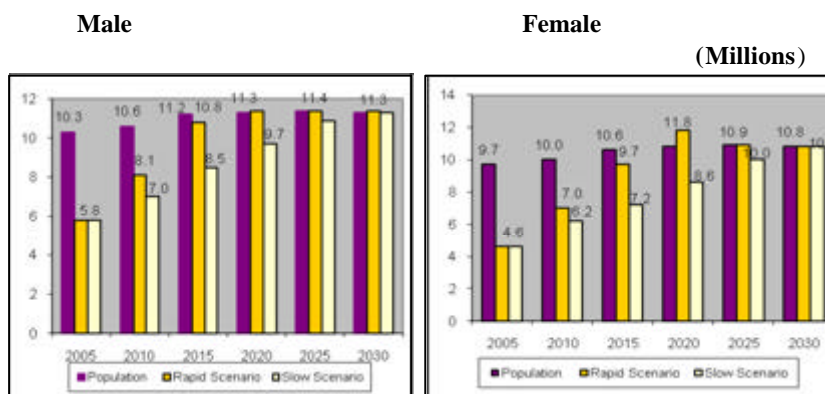
		(Millions)			
Year	Estimated Population	Simulated Enrolment		Out of School Population	
		Scenario 1 Accelerated	Scenario 2 Slow	Scenario 1 Accelerated	Scenario 2 Slow
Moderate Fertility Decline Scenario					
Males (5-9 Years)					
2005	10.30	5.77	5.77	4.53	4.53
2010	10.64	8.10	7.02	2.54	3.62
2015	11.21	10.76	8.52	0.45	2.69
2020	11.34	11.30	9.75	0.04	1.59
2025	11.43	11.43	10.97	0.00	0.46
2030	11.31	11.31	11.31	0.00	0.00
Females (5-9 Years)					
2005	9.66	4.64	4.64	5.02	5.02
2010	10.03	7.02	6.21	3.01	3.82
2015	10.61	9.76	7.21	0.85	3.40
2020	10.78	10.78	8.62	0.00	2.16
2025	10.92	10.92	10.05	0.00	0.87
2030	10.82	10.82	10.82	0.00	0.00
Slower Fertility Decline Scenario					
Males (5-9 Years)					
2005	10.30	5.77	5.77	4.53	4.53
2010	10.64	8.10	7.02	2.54	3.62
2015	11.54	11.07	8.77	0.47	2.77
2020	12.36	12.30	10.63	0.04	1.73
2025	12.85	12.84	12.33	0.00	0.52
2030	12.84	12.84	12.84	0.00	0.00
Females (5-9 Years)					
2005	9.60	4.63	4.63	4.97	4.97
2010	10.03	7.02	5.82	3.01	4.21
2015	10.92	10.05	7.43	0.87	3.49
2020	11.76	11.70	9.41	0.07	2.35
2025	12.28	12.28	11.29	0.00	0.99
2030	12.29	12.29	12.29	0.00	0.00

Source: Population Projections (2009); Enrolment Simulations (Author's calculations).

Using assumptions of rapid increase in primary level enrolment, our simulation results show that school attendance would rise from 5.77 million in 2005 to approximately 11.31 million in 2015 for male children, and from 4.64 million to 10.82 million for girls with moderate decline in fertility to be able to reach universal primary education—one of the MDGs. This means that primary school enrolments need to be almost doubled from its current levels to achieve this target (Table 4). The *first scenario* of rapid increase in enrolments appears to be rather an ambitious target and unlikely to happen, especially when viewed in terms of low levels of girls' school participation and large urban-rural gap.

Under the *second scenario* of a gradual and steady improvement in enrolment, the results show that it may take another two decades or so to achieve 100 percent primary level education in Pakistan. However, if the pace of fertility decline is slower, it would require even longer time to achieve universal education with larger backlog of children remaining out of school. Figure 5 presents the shortfall in completion of universal primary school enrolment by gender with population change under a moderate decline in fertility for both scenarios of a rapid and slow increase in enrolment rates (Figure 5).

Fig. 5. Projected Population and Primary Level Enrolments by Gender, under Assumptions of Moderate Decline in Fertility: 2005-2030

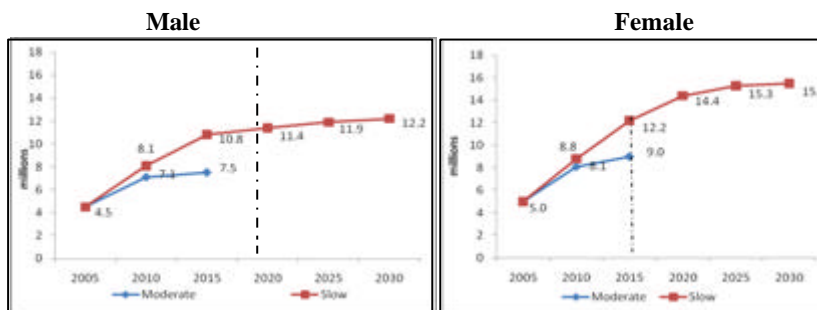


2. Population Out of School

Pakistan faces the challenge of having one of the highest numbers of out-of-school children; most of whom are females and are more likely to be from rural areas. Education simulations show that under assumptions of moderate fertility decline and *rapid enrolment scenario*, the out-of-school and illiterate population aged 5-9 years will be cumulated to 7.5 million boys and about 9

million girls (16.7 million in total) in 2015—the year targeted to achieve 100 percent primary enrolment. Under the second scenario of a *gradual increase in enrolment*, the number of children who will never enter school will be augmented to 10.8 million boys and 12.2 million girls in 2015, and this number will cumulatively rise to 12.2 million boys and 15.5 million girls in 2030, making it to a total of approximately 27.7 million out of school children. This indicates an increment of about 11 million additional children who would remain out of school under the slow enrolment scenario reflecting current (Figure 6). This large bulk of children with no school exposure will remain a challenge for reaping the benefits of demographic dividend in the coming decades.

Fig. 6. Projected Estimates of Out-of-School Population, Primary Level: 2005-30



Note: The numbers shown are cumulative for the period under study.

Figure 6 clearly indicates that a significant proportion of the overall population of young people who will enter the labour force have no education and skills with a large disadvantage in terms of employment opportunities. This situation calls for focused efforts to remove the constraining factors that contribute to keeping children out of school including high dropout rate, poor quality of education, and high poverty levels. Keeping in view the large gender gap in enrolment, it seems crucial to expand primary school network to promote girl education in rural areas. Based on the prospective population-education gap at primary level, it is estimated that more than 60,000 primary schools would be needed to absorb more than 16 million children, both boys and girls by the year 2015, in addition to recruiting more teachers and providing related school facilities. This situation demands substantial increment in budgetary allocations for primary level education, given the fact that education sector is under-resourced in Pakistan receiving only 2.96 percent of GDP in 2006-07 [Mahbub ul Haq Development Centre (2007)], which is likely to increase to 4 percent for the next plan period [Pakistan (2010)].

3. Secondary Education Scenario

The transition from primary to secondary level education⁷ is critical for preparing the youth for technical, vocational and higher education that are all conducive to achieving demographic dividend outcomes. Evidence shows that countries with high proportions of secondary education have benefited from it in terms of enhanced productivity and higher economic growth [Bloom and Williamson (1998); Mason (2005)].

The enrolment rate trends show that only 30 percent of males and 21 percent of females aged 10-14 were attending middle and matric levels in 2005-06, a reflective of a substantial number of young labour force entrants who are ill-equipped to meet the labour market demands. The low percentage of population reaching and then completing secondary education are due to high dropout/discontinuation rates after primary education, estimated at 45 percent, compared to 30 percent at the primary level, and this disadvantage is even worse for rural girls [Mahmood (2004); SDPC (2003)].

Assuming that enhancement in primary education leads to a rise in secondary level enrolment, our results of education simulations under moderate fertility decline and *accelerated enrolment trend scenario* show that if males aged 10-14 years at secondary education increase from 30 to 80 percent during 2005-2030, the number of enrolled boys will increase from about 3.02 million to 9.12 million. Correspondingly, if female secondary level enrolment rate increases from 21 to 70 percent, the number enrolled will rise from 1.98 million in 2005 to 7.62 million in 2030. Under the *second scenario* of rather a slower increase in enrolment rates from 30 to 55 percent for males and from 21 to 45 percent for females (see Table 3 for the set of education assumptions), population enrolled is expected to be approximately 6.27 million males and 4.89 million females by 2030 (Table 5).

The estimates in Table 5 show that the population aged 10-14 years not attending secondary level education under the *rapid enrolment scenario* was as large as 7.04 million for males and 7.45 million for females in 2005 which is expected to cumulate to 28.17 million for males and 33.04 million for females in the year 2030. Under the *slow enrolment trend scenario*, population-education deficit will be much larger at approximately 36.98 million for males and 40.99 million for females by the year 2030 (Table 5). Under slower fertility decline, the out-of-school youth (10-14 years) at secondary level is likely to be larger in number, thereby widening the population-education gap each year.

⁷The specified age for attending secondary levels is 10-14 years that entails to completion of middle and matric levels. However, evidence shows that about 20-25 percent of children in those ages are still attending primary levels especially among poor and rural households where many children are late starters of education and are grade repeaters too.

Table 5

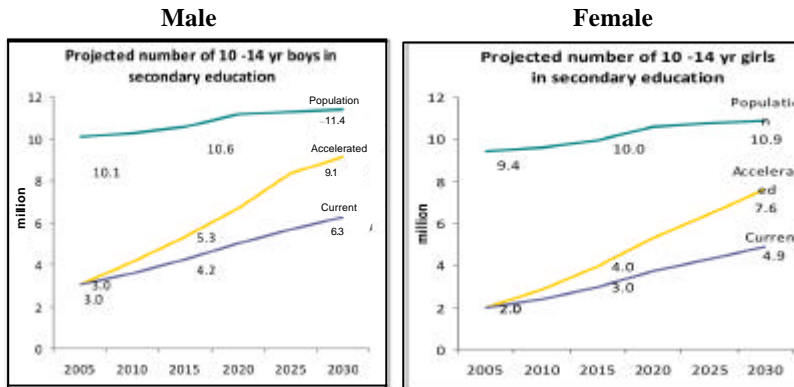
Estimated Enrolment and Out-of-School Population at Secondary Level, by Gender: 2005-2030

Year	Estimated Population	Simulated Enrolment		Out of School Population	
		Scenario 1 Accelerated	Scenario 2 Slow	Scenario 1 Accelerated	Scenario 2 Slow
Moderate Fertility Decline					
Males (10-14 Years)					
2005	10.06	3.02	3.02	7.04	7.04
2010	10.25	4.10	3.59	6.15	6.66
2015	10.59	5.30	4.23	5.29	6.36
2020	11.17	6.70	5.03	4.47	6.14
2025	11.30	8.36	5.65	2.94	5.65
2030	11.40	9.12	6.27	2.28	5.13
Female (10-14 Years)					
2005	9.43	1.98	1.98	7.45	7.45
2010	9.61	2.88	2.40	6.73	7.21
2015	9.99	3.99	2.99	6.00	7.00
2020	10.58	5.29	3.70	5.29	6.88
2025	10.75	6.45	4.30	4.30	6.45
2030	10.89	7.62	4.89	3.27	6.00
Slower Fertility Decline					
Males (10-14 Years)					
2005	10.06	3.02	3.02	7.04	7.04
2010	10.25	4.10	3.59	6.15	6.66
2015	10.59	5.30	4.24	5.29	6.35
2020	11.49	6.90	5.17	4.59	6.32
2025	12.32	8.62	6.16	3.70	6.16
2030	12.84	10.27	7.06	2.57	5.78
Female (10-14 Years)					
2005	9.43	1.98	1.98	7.45	7.45
2010	9.61	2.88	2.40	6.73	7.21
2015	9.99	4.00	3.00	5.99	6.99
2020	10.88	5.44	3.81	5.44	7.07
2025	11.72	7.04	4.69	4.68	7.03
2030	12.29	8.60	5.53	3.69	6.76

Source: Population Projections (2009); Enrolment Simulations (Author's own calculations).

Figure 7 presents the population-enrolment gap at secondary level under moderate fertility decline assumptions for both *rapid and slow enrolment scenario*. It is clearly evident that rapid enrolment would be the desired option to reduce education deficit in the next two decades, otherwise the young children who have already missed school or are unlikely to reach secondary level of education would create conditions that are highly unfavourable to capitalise on demographic dividends and pose as a threat rather than an opportunity to stimulate economic development.

Fig. 7. Projected Population and Enrolments at Secondary Level (10-14 Years), by Gender: 2005-30



Based on population projections and author's calculations of education simulations

A number of factors contribute to keep secondary level enrolments and educational skills low among youth in Pakistan including the limited availability of public schools and teachers, especially all-girls schools in rural areas, high drop outs, and poor quality of education in terms of curriculum, teaching methods and schooling facilities. It is also a problem that majority of young students receive the general type of education in which the subject matter does not conform to labour market requirements with little knowledge and direction for technical and vocational education. Of the small numbers who complete secondary or higher levels, the majority have little choices available for obtaining skills and scientific knowledge that offers better opportunities for employment. Moreover, high levels of female inactivity across education categories and persistent unemployment for both males and females present limited options to benefit from the ongoing demographic transition in Pakistan [Arif (2008); Aly (2007); Mahmood (2004); SPDC (2003)].

Given the dearth of skilled labour force in Pakistan, it is important to enhance secondary and above education culminating in technical and scientific fields to prepare our youth for productive employment and well-paid jobs. Research evidence in Pakistan shows that one more year of secondary and technical education brings 2.4 percent rise in income [Nasir and Nazli (2005)]. With an ever-increasing number of out-of-school children, this study suggests that massive efforts are required to raise primary and secondary level schooling through increased resources and focused interventions to specifically target rural, poor and marginalised population to redress gender imbalance and large education deficit in Pakistan. Increased primary and secondary education would also contribute to accelerate the pace of fertility decline that would lessen the

burden on educational system and improve child quality and distribution of resources among lesser number of school age children.

8. CONCLUSIONS AND POLICY RECOMMENDATIONS

Even though the demographic dividend offers an opportunity in terms of reductions in dependency ratios and increased proportions of population in the labour force, the prospects of improving education levels and achieving 'universal primary education' remain daunting and challenging for Pakistan. The school going and youth population aged 5-24 years constitutes 45 percent of the total population which requires huge investments at least up to secondary-level education and skills' training to deliver dividends and contribute to economic growth.

Evidence shows that nearly 50 percent of children at ages 5-9 and even higher proportions in ages 10-14 are reported as remaining out of school in recent years, and the problem becomes even more alarming when assessed in terms of the achievement of the MDG goal of 100 percent primary level enrolment by 2015. Approximately 17 million children are likely to remain out of school even under accelerated enrolment scenario by 2015, and this number is expected to increase to more than 29 million by 2030 if the MDG target is not achieved and rise in enrolments follows the current trend.

The transition from primary to secondary level education is critical for preparing the youth for technical, vocational and higher education that are all conducive to achieving demographic dividend outcomes. Despite an improvement in secondary level enrolments in recent years, especially for females, the population-education gap remained as large as 7 million for males and 7.6 million for females aged 10-14 years in 2005-06, and this backlog is likely to grow further if we fail to increase enrolments at an accelerated pace and make substantial increment in resources, both financial and human, to retain young children at secondary level of education. With a total focus on bringing maximum number of children in school in the coming years, it is equally important to explore avenues and opportunities to address the large backlog of large number of children at ages 10-18 who have missed school and are unlikely to attend formal or informal system of education. To deal with the issue of large education deficit and to maximise the effects of demographic dividend, the following policy suggestions need some consideration.

With an ever increasing number of out-of-school children with no literacy, numeracy, or basic skills, it is crucial to address their needs as part of a social protection strategy, whether through basic literacy, skill development and other empowerment schemes.

Large inequalities in school enrolment by gender and residence, especially in rural population require focused interventions to bridge these gaps. Funds need to target rural and poor households to cope with the challenge of gender imbalance and

shortages of quality schools and teachers. The best approach may be to focus on districts with literacy and enrolment rates of less than 20 percent which are mostly placed in rural Sindh, Balochistan and southern parts of the Punjab province. The PSLM data with district representation may provide the basis to identify places/locations to be targeted for special interventions.

Secondary level enrolments need to rise dramatically, especially to match the need for jobs in skilled occupations and non-agricultural sectors.

A substantial increase in budgetary allocations for primary and secondary level education is required to achieve the goal of 'education for all', as was done by the governments of countries that achieved tremendous economic growth during the 'East Asian Miracle'.

The projected educational structure of population suggests that the investment in education sector need to be increased substantially to absorb the prospective increase in enrolment at different levels. In terms of policy actions, it appears that near-term investments in education at primary and secondary levels are important to achieve long-term human capital development and economic growth objectives. It is a well recognised view that education can be an agent of change and economies that invested heavily in education have performed better in all health and development indicators. Thus, improved educational composition of population may offer better opportunities to manage and adapt to the changing needs of the economy in the context of demographic dividend and to redress the loss of human potential for future generations in Pakistan.

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