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DEMOGRAPHIC CHANGE AND EDUCATIONAL PLANNING IN THE DEVELOPING COUNTRIES

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- The most common mistake which occurs when planners look at the growth of the primary school age population is to assume that the size of the primary school age cohort will grow at just about the same rate as the total population. In fact, this is not necessarily true. When birth rates and death rates are rising or falling, the primary school age group may be changing at a much different rate than the total population.

Section II: KENYA

- Kenya is a country where high fertility has combined with declining mortality to produce a high rate of population growth.

- The primary school age population will increase from 3.6 million in 1980 to 8.9 million in 2000 with the high projection; 8.5 million in 2000 with the medium projection; and 6 million children with the low projection. These projections suggest that the range of possible demographic alternatives which current planners must consider is very broad.

- The high and medium projections sustain the conventional wisdom that, in the case of Kenya and similar countries, rapid growth of the school age population will hinder efforts to achieve and maintain universal primary education.

- The size of the primary school aged population also grows rapidly between 1980 and 1995 in the low projection. Between 1995 and 2000, however, the size of the cohort actually declines despite the very high rate of growth of the national population. The number of entry level 6 year olds drops for an entire decade between 1990 and 2000.

Section III: SWAZILAND

- Swaziland is also a country where continued high fertility and declining mortality have resulted in a high rate of population growth. Despite the historic decline in death rates, life expectancy at birth (about 47 years in 1980) remains relatively low, allowing for the possibility of significant increases in life expectancy in the foreseeable future.

- In the high and medium projections, Swaziland follows the conventional pattern in that a rapidly expanding primary school age cohort will place serious obstacles in the path of

a Government and people committed to attaining and maintaining universal primary education.

- In the low projection, a rapid expansion of the primary school age group takes place between 1980 and 1990, after which time at least a temporary leveling off in size occurs for a decade.

- Most importantly, the Swazi projections indicate that in countries with comparatively low life expectancies at birth, even a precipitous decline in death rates will have only a moderate impact on the size of the primary school age cohort. Changes in fertility are clearly the most important demographic factors affecting the future size of the primary school age population in the developing countries.

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- Egypt represents a country which already achieved some reduction in fertility, although the decline did level off in the late 1970s.

- Between 1980 and 2000, the size of the primary school age population increases by 59 percent in the high projection; 43 percent in the medium projection; and 33 percent in the low projection. The Egypt projections again underscore the fact that anticipated change in fertility is a key variable which planners must take into account in assessing future needs.

Section V: SRI LANKA

- Sri Lanka is a country where, historically, both fertility and mortality have dropped substantially, and where, despite some recent evidence that the fertility decline might have slowed or stopped, most analysts believe that fertility will continue to decline in the future.

- In the high and medium projections, the size of the primary school age group continues to expand until 2000, although growth is much more rapid between 1980 and 1990 than it is between 1990 and 2000. After 2000, the cohort will remain stable or decline modestly in size over the ensuing two decades.

- Under the low projection, the primary school age population will expand only until 1990, after which it will begin to decline. By 2005, the size of the primary school age cohort will be about the same as it is today.

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- Ecuador is a country where high levels of rural to urban migration have resulted in a rapid rate of urban growth, over 4 percent per year.

- Because of migration, the projections suggest that the school age population of Ecuador is actually growing much faster in the cities than in the rural areas, despite much higher fertility in the countryside.

- As indicated by the Ecuador projections, the rate of growth of the school age population can vary significantly from one region of a country to another.

Section VII: JAMAICA

- Even in a country such as Jamaica which has a relatively high level of international migration and relatively low birth rates, the impact of emigration on the future size of the primary school age population is moderate.

- Jamaica also serves as an example of a country with very low fertility. In this case, the size of the primary school age population is already as big as it is ever going to be.

- Similarly, Jamaica again illustrates the notion that age subdivisions of the population are not necessarily growing at the same rate as the overall population. In Jamaica, the national population was growing by about 1.5 percent per year in 1980 at the same time that the primary school age population had already attained zero population growth.

Section VIII: OTHER DEVELOPING COUNTRIES

- Using the United Nations medium projections to look at changes in the size of the primary school age population between 1980 and 2000, varied patterns emerge in different parts of the world.

- In Africa, the thesis holds that continued rapid growth of the school age cohort will pose immense challenges to the nations of the continent as they seek to achieve and maintain universal primary education. Only on the islands of Cape Verde, Mauritius and Reunion does the growth of the primary school age population promise to be slow. Only in two North African states, Egypt and Tunisia, would growth be in the moderate 20 to 50 percent range. Everywhere else in Africa, growth of the primary school aged population will be rapid, and in most cases it will be very fast, with an increase of more than 80 percent between 1980 and 2000.

- The pattern in Latin America is bimodal. On the Caribbean islands and in temperate South America, growth of the primary school age population will be either very modest or else negative. The exception is the impoverished nation of Haiti where growth of both the national population and the primary school aged cohort will continue to be rapid.

- In Central America and tropical South America, the growth of the primary school aged group is likely to be fast in most countries. Growth, however, will be more moderate in the two demographic giants of the region. In Mexico, the projections indicate a 38 percent increase in the size of the primary school aged population between 1980 and 2000, while in Brazil the projected increase will be 34 percent over the same period of time.

- Asia also exhibits considerable variation. In East Asia and Eastern South Asia, the projected increase in the size of the primary school age cohort will either be slow or moderately fast in most countries. Most importantly, the projected increase in China is a minus 16 percent while the increase in Indonesia would only be 7 percent.

- On the other hand, growth of the primary school aged population in Middle South Asia and Western South Asia will continue to be rapid. In particular, the Arab states of Western South Asia have projected increases in the size of the primary school age population equalling or surpassing those of the states of sub-Saharan Africa. The great exception in Middle South Asia is the demographic giant India where the primary school aged cohort would grow by only 13 percent between 1980 and 2000.

- If future trends turn out to be closer to the United Nations high variant than the medium projections, then even more countries will experience very rapid growth of the primary school age population. On the other hand, if future demographic trends in the developing countries prove to be closer to the low projections, then a greater number of countries will witness moderate or slow growth of the primary school aged population.

INTRODUCTION

Social and economic development is not only dependent on material resources and economic capital to develop those resources, but perhaps even more so on the development of human capabilities. Materials and capital are passive - the knowledge and skills of people provide the dynamic instruments with which to achieve social and economic development.

At the same time, the formal educational system is most often entrusted with the responsibility of providing the required knowledge and skills. This fact has led many developing nations to regard rapid expansion of the educational system as the way to unravel the Gordian knot of development. In particular, the achievement of universal primary education has become a major goal throughout the developing world.

Planning to achieve and/or to maintain universal primary education requires a long range view. Teachers are trained for careers of 20, 30 or more years. Schools and classrooms are constructed to last 25 years or longer. Consequently, committing scarce resources in the present requires some conscious or unconscious assumption about demographic trends in the future.

Indeed, while many social and economic factors affect the demand for schooling, a chief determinant in a truly universal system of primary school education is the size of the primary school age cohort. Demographic change, then, is especially important to long range educational planning. Conventional wisdom says that quantitative progress in expanding educational systems in many developing countries is being negated by the continued rapid growth of the population. A corollary assumption is that the rate of growth of the primary school age population is about the same as the rate of growth for the entire population. The present hypothesis is that these assumptions do not reflect the

range of demographic realities in developing countries. This analysis seeks to reveal that change.

Six different countries from the developing world are used as case studies to look at the impacts of demographic change on the size of the primary school age cohort. Using a cohort-component projection methodology, the population for each country will be projected into the future using alternative assumptions about birth rates, death rates and migration patterns to see what impact different demographic changes will have on the size of the primary school age cohort. To keep these assumptions within a range of likely reality, most follow the assumptions used by the United Nations Population Division in preparing its most recent set of world population projections.

Because the historic evolution of the country is also important in determining the future size of this cohort, and because potential changes are in part bounded by the present demographic situation, the six countries have been chosen to represent countries with specific demographic characteristics.

1. Kenya is a nation where fertility rates have been high for a long period of time while mortality has declined to relatively low levels.

2. In Egypt, fertility dropped for several years and then the decline levelled off and fertility may actually have risen in recent years.

3. Sri Lanka represents a nation which has experienced significant fertility decline over time and where fertility is projected to decline even further in the future.

4. Swaziland is a nation where death rates are still relatively high, creating the possibility for a significant decline in mortality in the future.

5. Ecuador represents a nation which has had high rural to urban migration.

6. Jamaica is a country which has experienced significant outmigration.

In some circumstances, classifications are not necessarily exclusive of one another.

To conclude, all nations of the developing world will be classified to see if any patterns emerge regarding the future size of the primary school age cohort.

Computer Software

Because demographic conditions are ever-changing, a study of this nature, however cogent, can quickly become dated and then ignored, a fate not unbeknowst to AID centrally funded projects. To avoid such a dismal end and to provide a lasting product to AID, the Futures Group has also delivered the computer software used to prepare the projections in this study. In the appropriate jargon, the program is "user friendly" and does not require any particular computer expertise on the part of the operator. The program is written to be used on an Apple II Plus microcomputer and is probably one of the better pieces of demographic software prepared for the Apple. Education specialists and others interested in using the demographic projection program may contact Frank Method in the Office of Policy Development and Program Review, Division of Human Resources.

For those without access to an Apple or hesitant to use computers, the Futures Group has also arranged with the Economic and Social Data Services Division to have the program placed on AID's IBM 370 mainframe computer. The Economic and Social Data Services Division will provide assistance to users.

Section I: THE GROWTH OF THE PRIMARY SCHOOL AGE POPULATION: A DEMOGRAPHIC UNDERSTANDING

So much of the ensuing discussion is based on an understanding of change in the size of the primary school age population that it is best to indicate the demographic underpinnings at the onset.

In particular, the demographic notion of a stable population is important to this study. Where age-specific fertility rates and age-specific mortality rates have been the same for a period of time, then the rate of natural increase (the rate of population growth in the absence of international migration) remains the same each year and each age group grows at the same rate as the rate of growth of the total population. A population is then referred to as a stable population. However, when fertility rates and mortality rates are not consistent over time, then the rate of natural increase tends to fluctuate and, most importantly to the present discussion, the different age groups can and will be growing at significantly different rates. Thus, when fertility and mortality have both been high for a long period of time, the primary school age group will grow at almost the same rate as the overall population, but when fertility and mortality are in the process of declining (or rising), the difference between the rate of growth of the primary school cohort and the rate of growth of the population is likely to be a significant one.

Nonetheless, the most common fallacy which occurs when planners look at the growth of the school age population is to assume that the size of the primary school age cohort will grow at just about the same rate as the total population. In fact, this is not at all necessarily true.

What determines the rate of population growth in countries where international migration is not significant is the number of births over a period of time

less the number of deaths. Keeping this fact in mind, a hypothetical illustration shows how a cohort can grow at a different rate than the overall rate of population growth. Suppose that a country with 50,000,000 persons at the beginning of the year has 2,500,000 births and 1,000,000 deaths during that year. This would result in an annual growth rate of about 3 percent and a population of 51,500,000 at the end of the year.

January 1, 1980 - Total Population =	50,000,000
January 1, 1980 to December 31, 1980:	
Number of Births =	2,500,000
Number of Deaths =	1,000,000
Natural Increase =	1,500,000
January 1, 1981, Total Population =	51,500,000

Rate of Population Growth During 1980 = 2.96 percent

Suppose also that of the infants (0 to 1 year olds in demographic parlance), 90 percent survive until the beginning of the next year or a cohort size of 2,250,000 0 to 1 year olds.

The next year, due to a modest decline in the birth rate, another 2,500,000 children are born. Because of dropping mortality, only another 1,000,000 persons die. As a result:

January 1, 1980, Total Population =	51,500,000
January 1, 1981 to December 31, 1981:	
Number of Births =	2,500,000
Number of Deaths =	1,000,000
Natural Increase =	1,500,000
January 1, 1981 - Total Population =	53,000,000

Rate of Population Growth During 1980 = 2.87 percent

Again, 90 percent of the infants survive until January 1, 1983.

January 1, 1981 - Size of 0 to 1 year old cohort =	2,250,000
January 1, 1982 - Size of 0 to 1 year old cohort =	2,250,000
Rate of growth of cohort during 1981 =	0 percent

In this example, then, the 0 to 1 year old age cohort was not growing at all during 1981 at the same time that the total population was growing by 2.9 percent per year.

Another example may also be used. The following tables indicate the results of a population projection made for Ghana which assumes that both fertility and mortality remain constant over the next 20 years. The annual rate of growth of the total population is virtually the same in all five year intervals.

1980-1985	3.26 percent
1985-1990	3.26 percent
1990-1995	3.30 percent
1995-2000	3.34 percent

Because Ghana in these circumstances would not yet be a perfect stable population, some variance in the rate of growth among the different age groups would persist. For example, during the 1995-2000 interval, the rate of growth would range from 2.4 percent per year from the 50 to 54 year old age group to 3.9 percent for the 20 to 24 year old age group. In all age groups, the rate of growth would be positive and high.

GHANA: POPULATION BY AGE GROUP ASSUMING CONSTANT FERTILITY AND MORTALITY, 1980-2000

AGE GROUP	1980	1985	1990	1995	2000
0-4	2,244,000	2,634,042	3,094,685	3,666,658	4,365,328
5-9	1,758,000	2,134,560	2,505,592	2,943,771	3,487,851
10-14	1,441,000	1,728,907	2,099,237	2,464,128	2,895,056
15-19	1,201,000	1,416,187	1,699,137	2,063,090	2,421,698
20-24	998,000	1,172,373	1,382,429	1,658,634	2,013,909
25-29	822,000	969,061	1,138,369	1,342,330	1,610,523
30-34	665,000	795,136	937,392	1,101,159	1,298,448
35-39	568,000	640,007	765,247	902,154	1,059,750
40-44	476,000	542,881	611,698	731,390	862,236
45-49	396,000	450,619	513,952	579,090	692,385
50-54	325,000	368,926	419,826	478,855	539,530
55-59	262,000	295,341	335,271	381,546	435,220
60-64	201,000	228,878	257,982	292,872	333,317
65-69	146,000	165,115	188,051	211,938	240,614
70-74	96,000	109,151	123,466	140,648	158,490
75+	80,000	93,962	108,065	122,983	140,084
TOTAL	11,679,000	13,745,146	16,180,399	19,081,246	22,554,439

GHANA: AVERAGE ANNUAL RATE OF GROWTH (PERCENT)

BY AGE GROUP ASSUMING CONSTANT FERTILITY AND MORTALITY, 1980-2000

AGE GROUP	1980-1985	1985-1990	1990-1995	1995-2000
0-4	3.21	3.22	3.39	3.49
5-9	3.89	3.21	3.22	3.39
10-14	3.64	3.88	3.21	3.22
15-19	3.30	3.64	3.88	3.21
20-24	3.22	3.30	3.64	3.88
25-29	3.29	3.22	3.30	3.64
30-34	3.57	3.29	3.22	3.30
35-39	2.39	3.57	3.29	3.22
40-44	2.63	2.39	3.57	3.29
45-49	2.58	2.63	2.39	3.57
50-54	2.54	2.58	2.63	2.39
55-59	2.40	2.54	2.59	2.63
60-64	2.60	2.39	2.54	2.59
65-69	2.46	2.60	2.39	2.54
70-74	2.57	2.46	2.61	2.39
75+	3.22	2.80	2.59	2.60
TOTAL	3.26	3.26	3.30	3.34

In the next two tables, the population of Ghana is projected under different assumptions. In this case, both mortality and fertility are changing. Life expectancy at birth for males increases from 49.1 years between 1980 and 1985 to 56.3 years for the 1995-2000 interval, while life expectancy at birth for females increases from 50 to 60 years over the same period of time. The fertility rate, the average number of births per woman over the course of her reproductive years, drops from 6.7 between 1980-1985 to 5.4 between 1985-1990; 4.4 between 1990-1995; and 3.6 between 1995 and 2000. This decline roughly corresponds to the United Nations low projection for Ghana.

Notice, now, that the rate of growth of the total population is changing over time, dropping from an annual average of 3.3 percent between 1980 and 1985 to an annual average of about 2 percent between 1995 and 2000. (To keep the latter number in perspective, India, the veritable symbol of rapid population growth, had about a 2 percent growth rate in 1980).

Also, the rates of growth of the different age groups vary much more widely than in the constant fertility and mortality case. The 0 to 4 age group begins to decline in size after 1985; the 5 to 9 age cohort starts to decline in size after 1990; and the 10 to 14 year old age group begins to decline in size after 1995. Between 1995 and 2000, the primary school age population would actually be dropping in size at the same time that the total population would be increasing by a rapid 2 percent per year. During that interval, the range of growth rates would vary from -0.5 percent for the 10 to 14 year old age group to 4 percent per annum for the 20 to 24 year old age group.

In sum, when fertility and mortality are in flux, the primary school age population may be changing at a much different pace than the total population. When fertility is dropping, the rate of growth of the school age cohort may be much lower than the rate of growth of the overall population. A corollary

GHANA: POPULATION BY AGE GROUP ASSUMING DECLINING FERTILITY AND MORTALITY, 1980-2000

AGE GROUP	1980	1985	1990	1995	2000
0-4	2,244,000	2,634,042	2,548,006	2,514,764	2,508,553
5-9	1,758,000	2,134,560	2,525,855	2,460,230	2,443,206
10-14	1,441,000	1,728,907	2,104,154	2,494,934	2,434,693
15-19	1,201,000	1,416,187	1,702,954	2,076,689	2,466,989
20-24	998,000	1,172,373	1,386,409	1,671,569	2,043,554
25-29	822,000	969,061	1,142,321	1,355,245	1,639,010
30-34	665,000	795,136	941,085	1,113,401	1,325,504
35-39	568,000	640,007	768,653	913,484	1,084,933
40-44	476,000	542,881	614,709	741,627	885,164
45-49	396,000	450,619	516,654	587,865	712,539
50-54	325,000	368,926	422,305	486,881	556,917
55-59	262,000	295,341	337,598	388,959	451,281
60-64	201,000	228,878	260,206	299,327	348,180
65-69	146,000	165,115	190,106	218,293	254,070
70-74	96,000	109,151	125,132	145,915	169,624
75+	80,000	93,960	110,121	129,616	154,528
TOTAL	11,679,000	13,745,144	15,696,268	17,599,299	19,478,745

GHANA: AVERAGE ANNUAL RATE OF GROWTH (PERCENT) BY AGE GROUP ASSUMING DECLINING FERTILITY AND MORTALITY 1980-2000

AGE GROUP	1980-1985	1985-1990	1990-1995	1995-2000
0-4	3.21	-0.66	-0.26	-0.05
5-9	3.88	3.37	-0.53	-0.14
10-14	3.64	3.93	3.41	-0.49
15-19	3.30	3.69	3.97	3.44
20-24	3.22	3.35	3.74	4.02
25-29	3.29	3.29	3.42	3.80
30-34	3.57	3.37	3.36	3.49
35-39	2.39	3.66	3.45	3.44
40-44	2.63	2.49	3.75	3.54
45-49	2.58	2.74	2.58	3.85
50-54	2.54	2.70	2.85	2.69
55-59	2.40	2.67	2.83	2.97
60-64	2.60	2.57	2.83	2.99
65-69	2.46	2.82	2.77	3.04
70-74	2.57	2.73	3.07	3.01
75+	3.22	3.17	3.26	3.52
TOTAL	3.26	2.65	2.29	2.03

notion, however, is that even when the rate of growth of the school age population is noticably less than the rate of population growth, overdue optimism by educational planners is unwarranted as the rate will again rise unless the growth rate of the overall population continues its descent towards zero. Demographic change, particularly as it affects a single age group, can occur in broad waves, and a planner looking at a shorter 10 to 15 year period can easily mistake a peak or trough for a permanent situation.

Section II: KENYA

The Primary School System

The primary school system which evolved in Kenya under British colonial rule resulted in many inequalities. During the colonial period, educational policy was part of an overall strategy of separate (and unequal) development. The colonial administration, supported by the white settler community, made little effort to develop a primary educational system for the African population. Rather, schools tended to be located near cities and white settlements to meet the needs of the European and Asian communities. What African schools did exist were underfinanced, while African students pursued a different, less rigorous, curriculum than their European and Asian counterparts.

As a consequence of these policies, on the eve of independence in 1962, about 75 percent of European and Asian children were enrolled in the primary schools of Kenya as opposed to less than 1/3 of the African children of primary school age. Even the latter figure is deceptively high because it reflects an intensive program to expand the African schools just prior to independence.

The Government of an independent Kenya determined that this situation would have to change dramatically if Kenya were to develop socially and economically, and, in fact, post-independence Kenya has committed a considerable share of its available resources to develop the education sector. For example, by 1979 recurrent expenditures for education accounted for over 30 percent of all government recurrent expenditures. In addition, Government efforts have been supplemented by the local self-help or Harambee movement.

As a consequence of post-independence policy, primary school enrollments in Kenya climbed dramatically. Between independence in 1963 and 1973,

primary enrollments increased at an annual rate of 8 to 9 percent. In 1973, however, the Government abolished tuition fees for Standards 1 to 4 and enrollments increased by 50 percent in that one year alone, reaching a total of about 2.7 million primary school students. Between 1975 and 1978, enrollments increased at about the rate of population growth, or 3.5 to 4.0 percent per year. In 1979, the Government of Kenya again introduced a new policy - in this case a milk distribution program - which dramatically affected primary school enrollments. Enrollments increased by 15 percent in that year alone, leading to a total enrollment of about 3.7 million students. By 1980, according to the Kenyan Central Bureau of Statistics, approximately 3.9 million children were enrolled in Kenyan primary schools. The net enrollment rate is equal to between 90 and 95 percent of the 6 to 12 age group. The gross enrollment ratio is closer to 110 percent of the 6 to 12 age group as many children over the age of 12 attend the primary schools.[1]

Demographic Trends

The first national census in Kenya in 1948 showed a population of 5.4 million persons. By the time of the 1962 census the population had grown to 8.6 million and by the 1969 census it had reached 10.9 million persons. After adjusting the 1979 enumeration for an estimated undercount and projecting it ahead one year, the Central Bureau of Statistics reported a mid-year 1980 population of 16.7 million persons. As indicated by these numbers, demographic trends over the past 30 years have resulted in an increasing rate of population growth.

The fertility rate (average number of births per woman during her reproductive years) is very high in Kenya and may have been increasing over the

past 30 years. The fertility level of about 6.5 births per woman in the early 1950s reached about 7.6 by the time of the 1969 census. Results from the 1977-1978 Kenyan Fertility Survey indicate that the fertility rate is now over eight children per woman and may still be rising. Although these estimates lack complete accuracy, fertility in Kenya is certainly extremely high and is possibly the highest of any country in the world. The reasons for increasing fertility are not well understood, but contributing factors include better nutrition, hygiene and health services and some weakening of traditional customs which acted to space births further apart such as prolonged breastfeeding, sexual abstinence following childbirth, and polygamy.

Corresponding to these high fertility rates, the birth rate (number of births per 1000 population) has remained very high, between 49 and 54, over the past 30 years.

The death rate (number of deaths per 1000 population) steadily declined due to improved health care and practices from over 20 in the early 1950s to about 14 today. The most significant improvement has been in infant mortality rates which declined from about 160 deaths per 1000 live births in the 1948-1958 period to approximately 83 at the present time. As a result, life expectancy at birth has increased from 40 to 45 years in the early 1950s to about 55 years today.

The high and increasing level of fertility combined with declining mortality has resulted in an increasing rate of population growth. The average growth rate of about 3 percent per year in the early 1950s (itself very high) has risen to around 3.9 - 4.0 percent today, one of the highest rates in the world. At the current rate of growth the population will double every 17 years. By the year 2000, less than 18 years from now, the population of Kenya will be almost 38 million persons if present trends continue.[2]

Population Projections

Kenya, then, is a country where continued high fertility rates have combined with impressively declining mortality rates to produce historically high rates of population growth. Regardless of what happens to fertility in the near future, the size of the primary school cohort will grow considerably between now and the year 2000. The three projections used below illustrate this fact. All three assume that life expectancy at birth for males increases from 53.7 years for the 1980-1985 period to 60.2 years for the 1995-2000 interval while life expectancy at birth for females increases from 58.2 years in 1980-1985 to 64.9 years during the 1995-2000 period.

1. High Projection

Again, the assumptions in these projections are based on those used by the United Nations Population Division in its most recent set of population projections. In the high projection, the fertility rate, a rate which is used to indicate the average number of children each woman would bear over the course of her reproductive years if present levels of fertility continued into the future, declines only modestly over the next 20 years from 8.1 children per woman between 1980-1985 to 7.6 children per woman during the 1995-2000 interval. As a consequence, the size of the total population increases from 16.7 million persons in 1980 to 25.8 million persons in 1990 and 40 million persons in 2000.

Based on a 7 year primary school cycle, the total number of 6 to 12 year olds would increase from 3.6 million in 1980 to 5.6 million in 1990 and 8.9 million in 2000, which is equal to nearly a 150 percent increase in 20 years. The number of entry age 6 year olds would increase from 586,000 in 1980 to

1,441,000 in 2000. In this kind of a population where neither fertility nor mortality is changing very dramatically, the distribution of the population by age does not change very much over time. Consequently, the size of the primary school age population will be growing at about the same rate as the total population at well over 4 percent per year.

2. Medium Projection

In the medium projection, the United Nations projected decline in fertility is still very slow as the fertility rate falls from an 8.1 child per woman average in 1980 to 6.8 children per woman in the 1995-2000 period. In this second projection, the size of the Kenyan population grows from 16.7 million persons in 1980 to 25.6 million in 1990 and 38.5 million in 2000. The size of the total population in 2000 is only 3.6 percent less than with the high projection.

The size of the primary school age population group would still increase dramatically over the next twenty years under the assumptions used in the medium projection. The number of 6 to 12 year olds would increase from 3.6 million in 1980 to 5.6 million in 1990 and 8.5 million in 2000, which represents a 20 year increase of about 135 percent. Over the same 20 year span, the number of 6 year olds in the population would increase from 586,000 to 1,347,000. The rate of growth of the primary school age cohort would still be about the same as the rate of growth of the national population.

In the medium projection, then, the size of the primary school aged population also grows very dramatically between 1980 and 2000.

3. Low Projection

In the low projection, the fertility rate is assumed to be cut almost in half from 8.1 children per woman in the 1980-1985 period to 4.2 children per woman in the 1995-2000 interval. Even in this case, the size of the Kenyan population virtually doubles between 1980 and 2000 from 16.7 million persons to 32.2 million.

With declining fertility, the size of the primary school age group changes in an intriguing manner, increasing from 3.6 million in 1980 to 5.6 million in 1990 and 6.3 million in 1995, then actually dropping back to 6 million persons by 2000. Between 1995 and 2000, the growth rate of the school age population would be -0.9 percent per year at the same time that the national population would be growing by a very rapid 2.7 percent per annum. The school age population would again begin to rise after 2000 but would not reach the 1995 level until after 2005.

Similarly, the number of entry level 6 year olds would grow from 586,000 in 1980 to 931,000 in 1990, but would then steadily decline over the ensuing decade to 847,000 in 2000. After that point, the number of 6 year olds would again begin to rise unless the fertility rate continued a precipitous descent to replacement levels.

Concluding Remarks

The key points derived from the above projections may be summarized as follows:

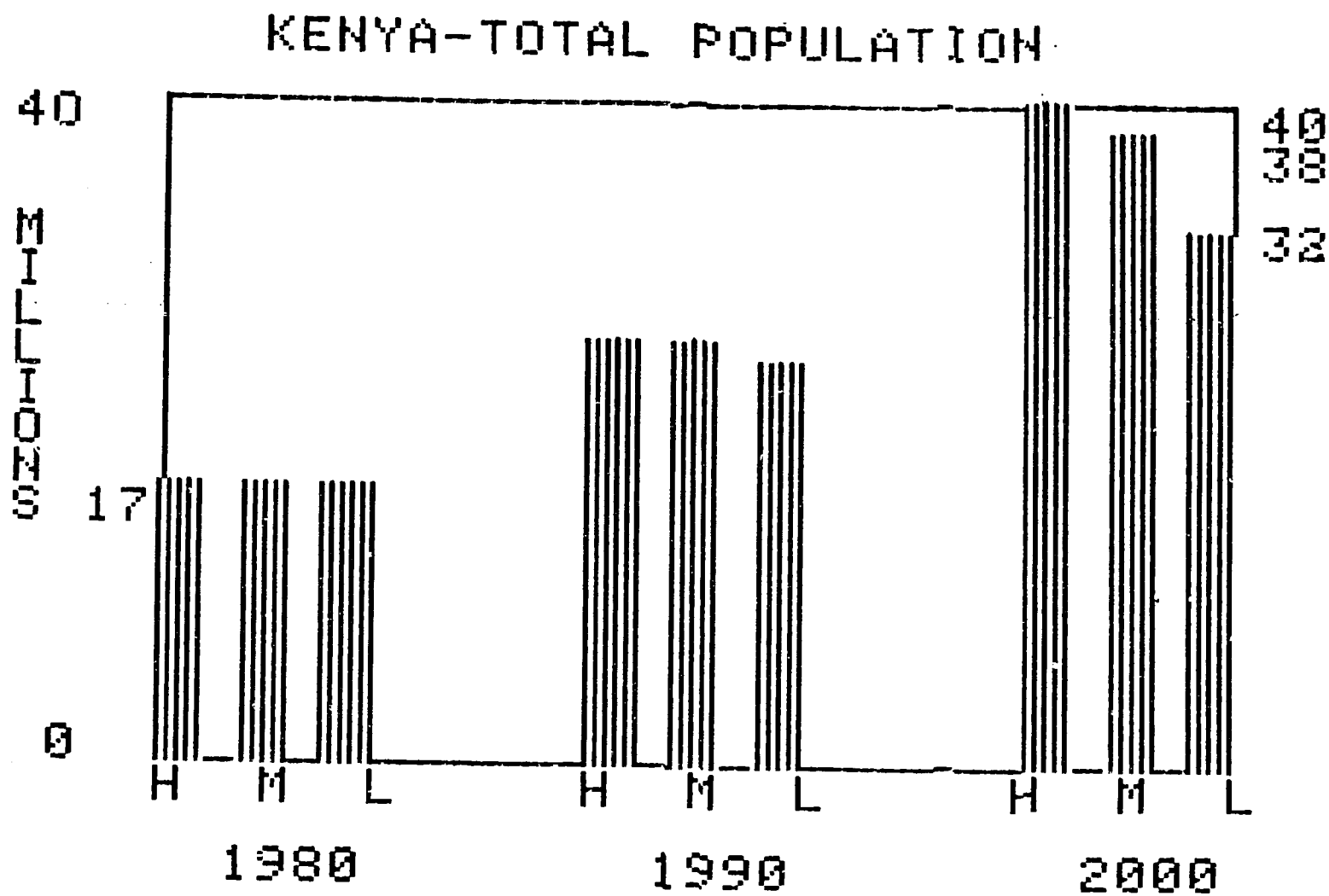
- Kenya is a country where high fertility has combined with declining mortality to produce a high rate of population growth. All likelihood is that the population will continue to grow rapidly in the foreseeable future. Because of the

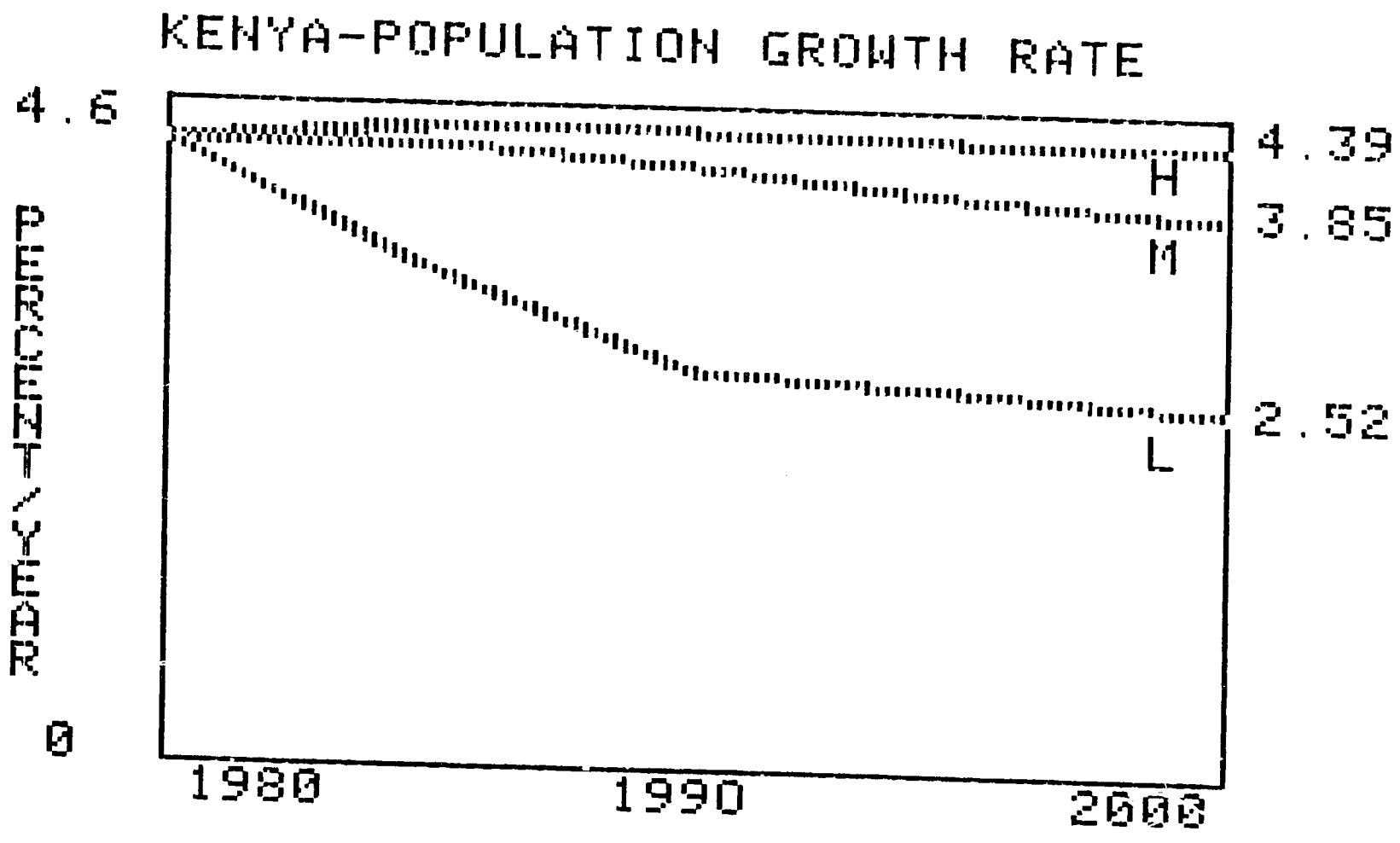
age structure and the levels of fertility and mortality, the size of the school age population will grow at a rate comparable to that of the overall population, except in the low projection where the rate of growth of the primary school aged group will drop considerably below that of the national population.

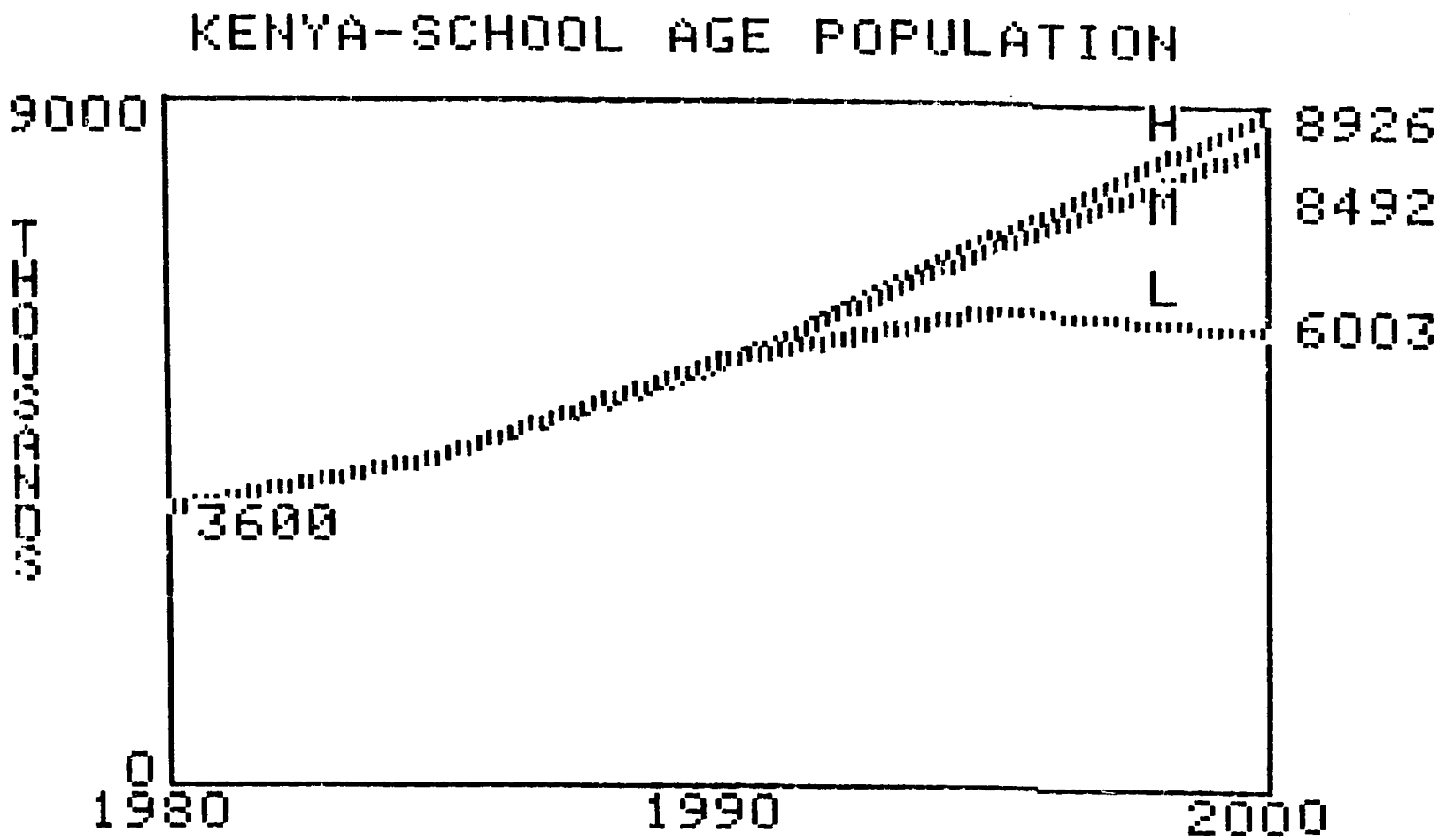
- Consequently, the conventional wisdom holds in the case of Kenya and similar countries. The growth of the primary school cohort will present enormous problems to the Government of Kenya as it seeks to achieve and maintain a system of universal primary education.

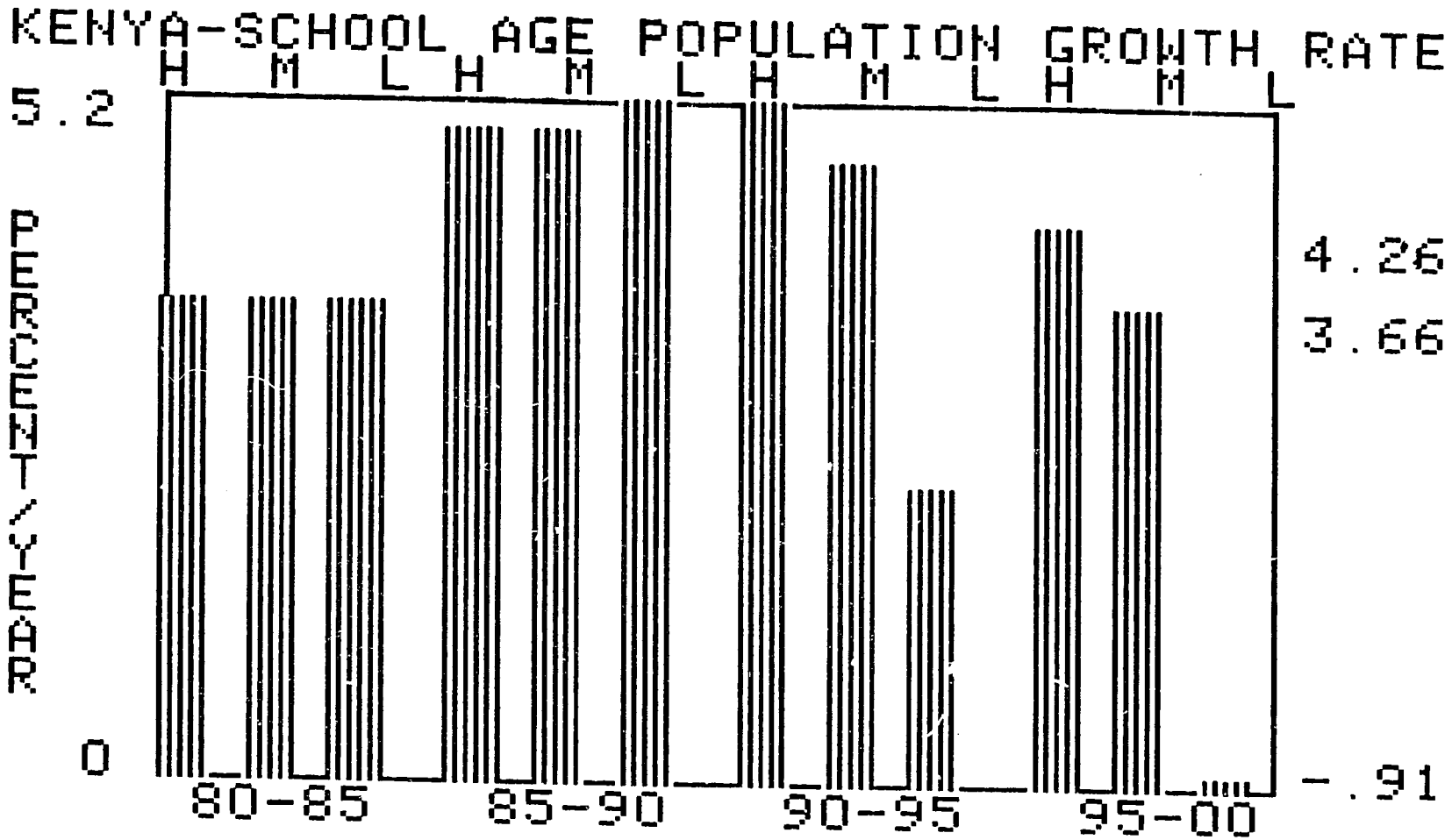
- Although the magnitude of the problem will be great even with the assumed decline in fertility in the low projection, the variation in the size of the primary school age population between the high projection and the low projection will be considerable. The difference between 8.9 million students in 2000 with the high projection and 6.0 million students in that year with the low projection has serious implications for educational planning in Kenya.

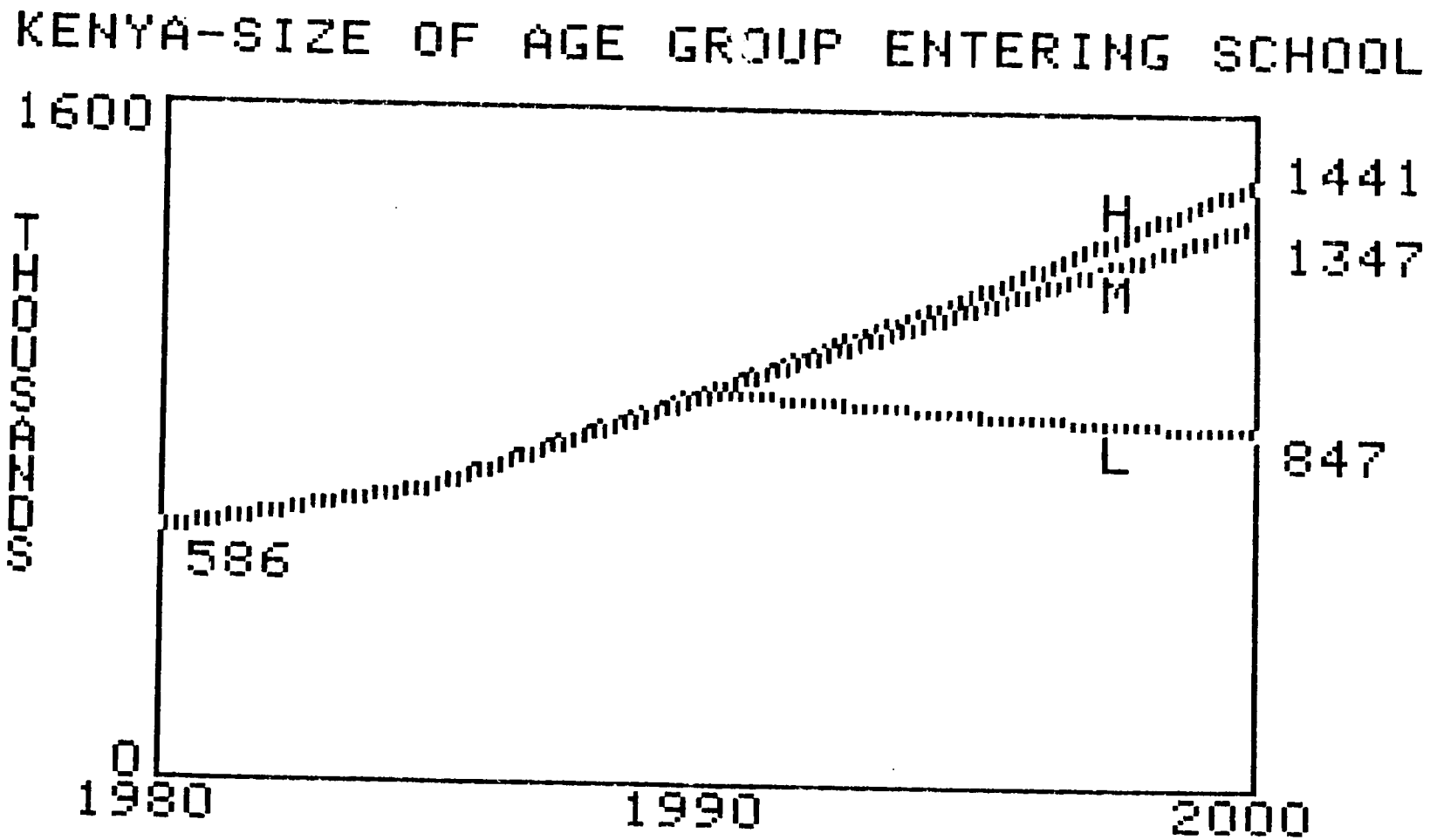
- In the low projection, the size of the primary school aged population grows rapidly between 1980 and 1995. Between 1995 and 2000, however, the size of the cohort actually declines despite the very high rate of growth of the national population. The number of entry level 6 year olds drops for an entire decade between 1990 and 2000.


KENYA-TOTAL POPULATION
40
MILLIONS
17
0
H
M
L
H
M
L
H
M
L
1980
1990
2000
40
30
20


KENYA-POPULATION GROWTH RATE
4.6
0
RATE-YEAR-PERCENT
H
M
L
4.39
3.85
2.52
1980
1990
2000


KENYA-SCHOOL AGE POPULATION
9000
0
THOUSANDS
3600
H
M
L
8926
8492
6003
1980
1990
2000


KENYA-SCHOOL AGE POPULATION GROWTH RATE
H M L H M L H M L H M L
5.2
PERCENT/YEAR
0
4.26
3.66
-.91
80-85
85-90
90-95
95-00


KENYA-SIZE OF AGE GROUP ENTERING SCHOOL
1600
THOUSANDS
0
1980
1990
2000
1441
1347
847
586
H
M
L

FOOTNOTES FOR KENYA

1. REDSO/EA and Central Bureau of Statistics. Access and coverage in the Primary Educational System, (1982,) pp 6-8. World Bank. Staff Appraisal Report: Fifth Education Project in the Republic of Kenya. (Washington: World Bank, 1981), pp 4-5.

2. The Futures Group. Kenya: The Effects of Population Factors on Development. (Washington: The Futures Group, 1982). pp 6-9.

Section III: SWAZILAND

The Primary School System

The Swazi educational system is currently undergoing rapid expansion as the government attempts to achieve its goal of universal primary enrollment by 1985.[1] Education in the country is still not compulsory,[2] and attendance is hampered by high costs (children must buy their own books), inadequate facilities and excessive walking distances.[3] In response to both current and anticipated future need the government has initiated an ambitious program of physical improvement, teacher training and curriculum reform. It is hoped that these reforms will both increase literacy rates (currently estimated at 65 percent[4]) and prepare a technically competent labor force to meet identified manpower needs.[5]

Schooling lasts for 12 years divided into seven years of first level (primary) school, three years of middle school and two final years of secondary school.[6] (Some pre-primary education is available as well although less than 2,000 pupils attended in 1978.[7]) The majority of primary schools are privately run mission schools with grants from the government.[8] The language of instruction is Si Swati in the lower primary grades and English from the middle primary grades on.[9]

The Ministry of Education (MOE) has administrative, financial and academic control of the school system. In 1978, total education expenditures were over 17.7 million Emalangeni which represented 7.2[10] percent of the Swazi GNP in that year. That percentage figure is up from the 5.2 percent level that education represented in 1970. Current educational expenditures in 1978 represented 70 percent of the total education budget, a proportion that is

significantly down from the 1970 level of 85.7 percent[11] (the result of an expanded capital program). Primary education claimed an approximate one-third share of the 1978 current expenditures budget,[12] a figure that has held constant at least since 1975. Future expenditures are likely to increase as the MOE proposes to continue building schools as well as increase both salary and non-salary expenditures at all levels.[13] It is anticipated that the proportion of the recurrent budget devoted to education will grow from 18 percent in 1978 to 25 percent in 1985.[14]

The size of the primary system increased substantially between 1970 and 1980. The number of schools increased by nearly 30 percent from 351 to 450.[15] The teaching staff nearly doubled over the decade to a total of 3,278[16] with a result that the average number of teachers per school has increased from 4.9 to 7.2. The number of students grew as well. In 1970 enrollment stood at nearly 70,000 but that figure increased by 62 percent to over 112,000 by 1980.[17] This means that the number of students per school has increased (from 196 to 248) but the number of students per teacher has dropped from 40 to 34.

Underlying the quantitative advances are some troubling quality measures which, while improved over previous years, indicate that the country still has a way to go to provide a quality education to all children. For example, while gross enrollment rates for the 6-12 age group stood at 103 percent in 1979, the net rate for the same group was 80 percent.[18] The repetition rate in 1976 stood at 11 percent and only 49 percent of entering students finish the seven year primary cycle.[19] The shortage of qualified teachers is probably one reason for the lack of success; in 1977 it was estimated that only three quarters of the primary school teachers were qualified for their positions.[20] It is clear, however, that the country recognizes these problems, and as indicated above, has launched an ambitious program of capital expansion and quality improvement aimed at correcting them.

Demographic Trends

Fertility has been high in Swaziland throughout the century. The 1976 birth rate (number of births per 1,000 population) was over 50, or about the same as it was in 1950. The fertility rate (average number of births per woman) was 6.9 in 1976, according to the census report.

Mortality remains high in Swaziland, especially among infants. The infant mortality rate (number of deaths to children under 1 year of age per 1000 live births) is still over 150. Nonetheless, mortality has actually declined over the past quarter century with improved public health care. Life expectancy at birth rose from 34 in 1950 to 48 in 1980. The death rate (deaths per 1000 population) fell from 32 in 1950 to about 19 in 1976.

High fertility and declining mortality have combined to give Swaziland a rapid rate of population growth. The population doubled from 280 thousand in 1950 to its present number of 560 thousand. If birth rates remain high, the population will double again, to nearly 1.2 million persons, over the next twenty to twenty-five years.[21]

Population Projections

Swaziland, then, like Kenya is a country where fertility rates have been high for a long period of time with little historical decline. Like Kenya, the size of the primary school cohort promises to be considerably larger in the future than it is today even with a decline in fertility. An examination of the results of the projections demonstrate this fact. In the first three projections - the high, medium and low - mortality for males is assumed to increase from 46.8 years in

1980 to 55.3 years in 2000, while mortality for females increases from 50 years in 1980-85 to 57.5 years in 1995-2000.

1. High Projection

In the high projection, the fertility rate drops modestly from 6.5 births per woman in 1980 to 6.1 births per woman in 2000. In this case, the size of the total population increases from 557,000 persons in 1980 to 758,000 persons in 1990 and 1,054,000 persons in 2000.

The size of the primary school age population, those children aged 6 to 12, doubles between 1980 and 2000 from 105,600 primary school students to 211,300 primary aged children. The number of 6 year olds, the entry age for primary school, grows from 17,000 in 1980 to 33,500 in 2000. The rate of growth of the primary school age group is actually slightly higher than the rate of growth of the overall population.

Period	Annual Rate of Growth of Total Population	Annual Rate of Growth of Primary School Aged Cohort
1980-85	2.99	3.60
1985-90	3.17	3.33
1990-95	3.26	3.44
1995-00	3.34	3.50

In the high projection, then, Swaziland faces a doubling of its primary school age population over a 20 year period.

2. Medium Projection

In the medium projection, the fertility rate falls somewhat more rapidly than in the high projection from 6.5 in 1980 to 5.5 over the 1995-2000 period. In this case, the population grows from 557,000 persons in 1980 to 753,400 persons in 1990 and 1,021,800 persons in 2000. The latter number is equal to about 34,000 fewer persons than with the high projection.

Over this same 20 year period, the size of the primary school age cohort increases from 105,600 school aged children to 201,900 school aged children or an increase of 91 percent. The number of entry level 6 year olds would increase from 17,000 in 1980 to 31,600 in 2000. The rate of growth of the primary school aged population would be comparable to the rate of growth of the national population.

In the medium projection, then, the size of the primary school aged population increases dramatically over the next 20 years.

3. Low Projection

In the low projection, the fertility rate falls quite rapidly in Swaziland from 6.5 births per woman in 1980 to 3.6 births per woman in 2000. In this case, the national population increases from 557,000 in 1980 to 887,600 in 2000.

The size of the 6 to 12 age group increases rapidly and dramatically from 105,600 in 1980 to over 150,000 in 1990 but then stays at about that level

until the end of the century. The number of 6 year olds grows from 17,000 in 1980 to 23,400 in 1990, then drops to 20,800 by 2000. (The number again rises to the 1990 level by 2010). What this projection shows, then, is that the size of the primary school age cohort will increase significantly for the first ten years of the projection, after which the impact of declining fertility will be felt to the point that the situation will not change much for the ensuing ten years.

It is also interesting to compare the rate of growth of the school age population with the rate of growth of the overall population. While the total population would be growing at 2.7 percent between 1980 and 1990, the primary school age population would be increasing more quickly at 3.6 percent per year. Between 1990 and 1995, however, the total population would be growing at 2.0 percent per year while the school age population would be expanding at only 0.8 percent per annum. Between 1995 and 2000 the national population would still be growing at a rapid 1.9 percent per year at the same time that the primary school age cohort would be declining in size by 1.2 percent per year.

4. Swaziland - Faster Increase in Life Expectancy

Because Swaziland is a high mortality country with substantial room to increase life expectancy at birth, two additional projections have also been made. In this case, both use the fertility assumption employed in the medium projection above, which is a decline in the fertility rate from a 6.5 child per woman average in the 1980-1985 period to a 5.5 child per woman average during the 1995-2000 interval.

In the first projection, life expectancy at birth is assumed to increase half again as fast as it does in the United Nations medium projection. More

precisely, life expectancy at birth for males is assumed to increase from 44.3 years in the 1975-80 interval to 60.8 years between 1995 and 2000. Life expectancy at birth for females is assumed to increase from 47.5 years in 1975-1980 to 62.5 years in the 1995-2000 interval.

In the second projection, life expectancy at birth increases twice as fast as it does in the medium projection. For males, life expectancy increases from 44.3 years in the 1975-1980 interval to 66.3 years by 1995-2000 and for females it increases from 47.5 years in 1975-1980 to 67.5 years in 1995-2000.

The table below compares the total population among the three projections.

SWAZILAND: Total Population, 1980; 1990 and 2000

By Alternative Mortality Assumptions

Year	Medium Projection	Faster Increase in Life Expectancy (1)	Faster Increase in Life Expectancy (2)
1980	557,000	557,000	557,000
1990	753,400	763,500	772,100
2000	1,021,800	1,057,100	1,088,300

By 2000, for example, the national population of Swaziland would be 1,021,800 persons with the medium projection; 1,057,100 persons if mortality declined one and one-half times as fast as it does in the medium projection; and 1,088,300 persons if mortality declines twice as fast as it does in the medium projection.

The table below shows the size of the primary school age population, the number of 6 to 12 year olds, for the three projections.

Year	Medium Projection	Faster Increase in Life Expectancy (1)	Faster Increase in Life Expectancy (2)
1980	105,600	105,600	105,600
1990	149,500	152,100	154,200
2000	201,900	211,600	219,800

In 2000, for example, the number of 6 to 12 year olds would be 201,900 with the medium projection. The primary school age population would be 211,600 children if mortality drops 1 1/2 times as fast, which would be 4.8 percent higher than with the medium projection. The number would be 219,800 if mortality drops twice as fast which would be 8.9 percent higher than the school aged population in the medium projection.

While changes in fertility will have the greatest effect on the size of the primary school age cohort, changes in mortality, especially in nations such as Swaziland which have comparatively low life expectancies, can also have a significant impact on the size of that age group.

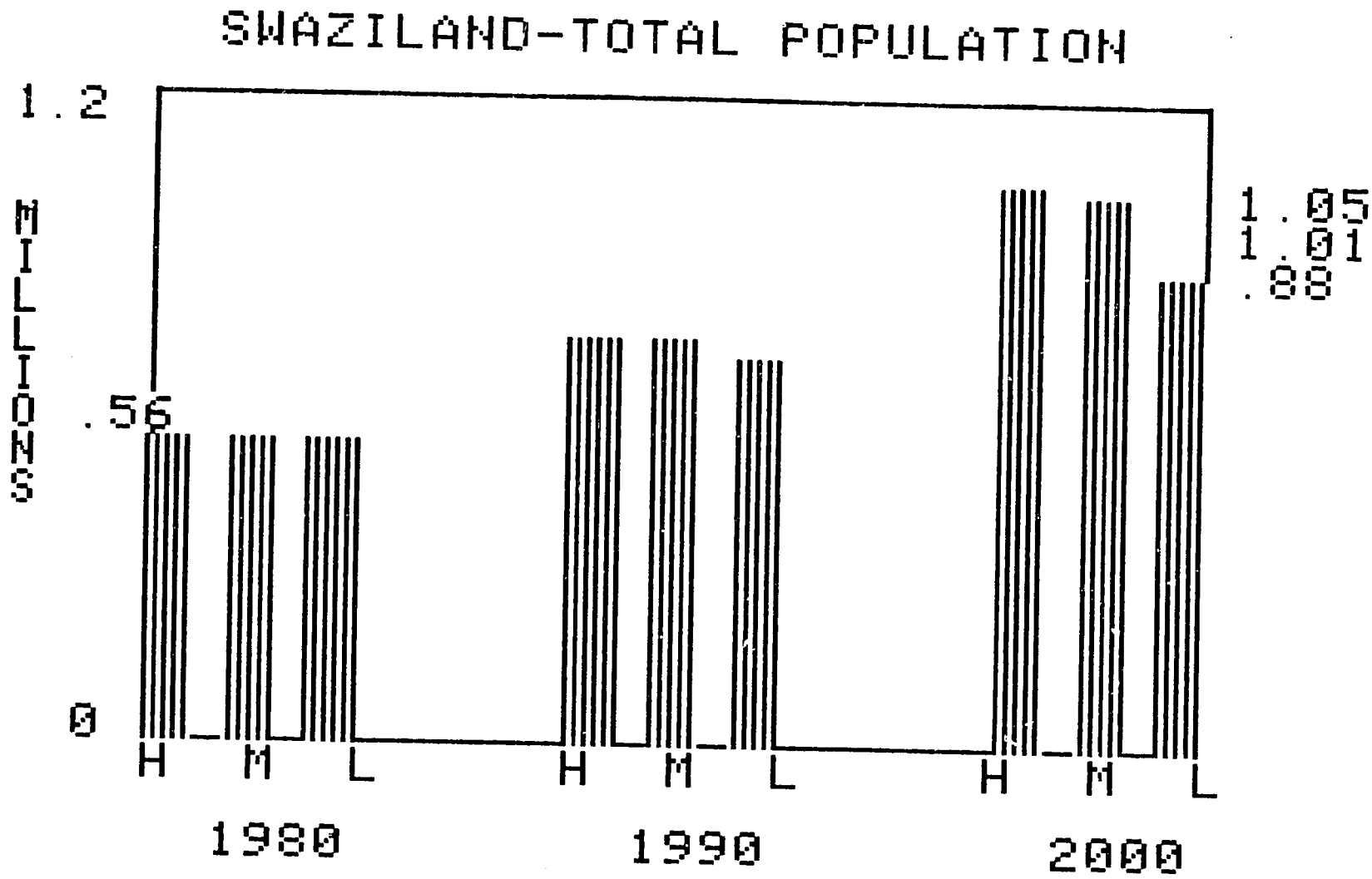
Concluding Remarks

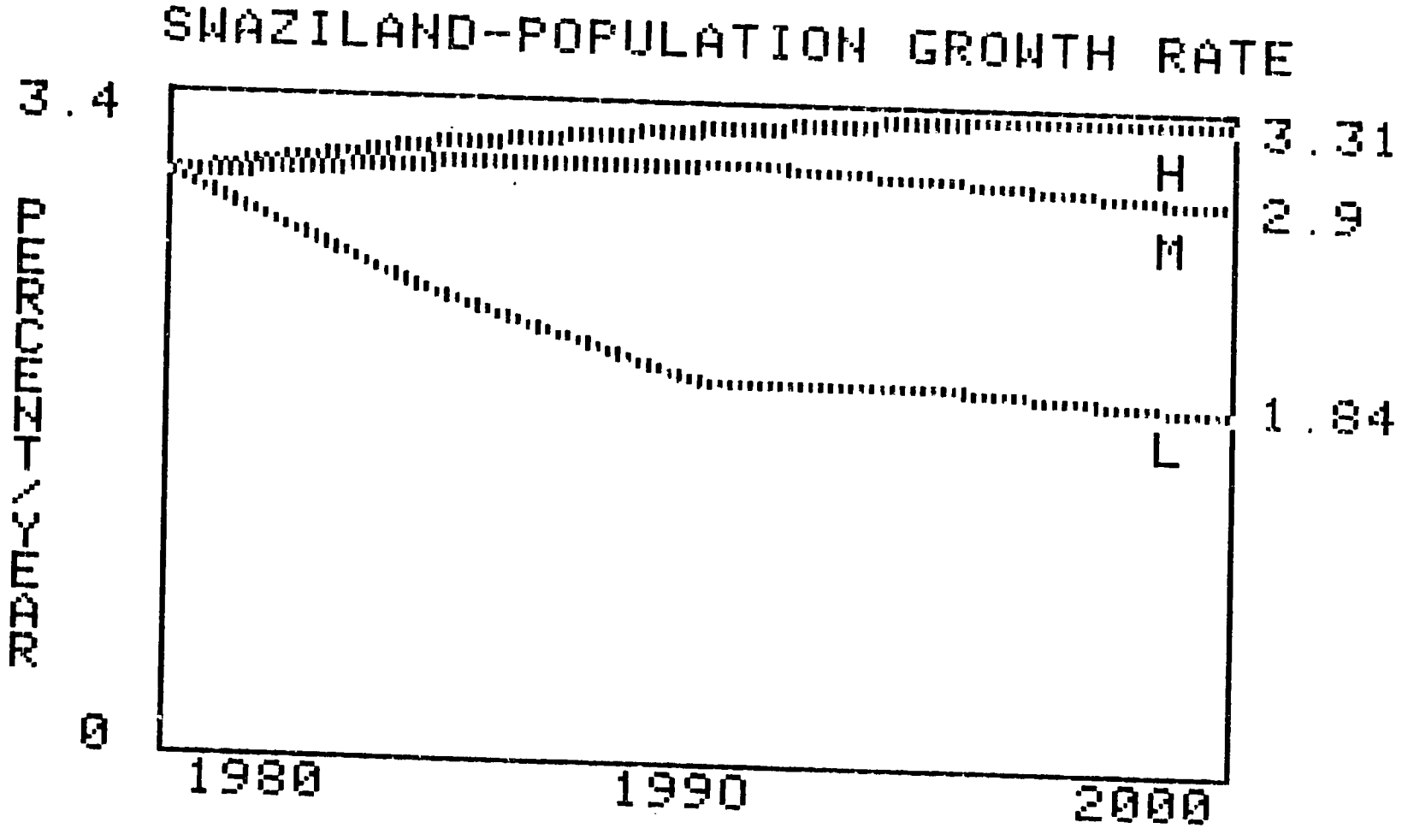
Several comments can be made about the Swaziland projections.

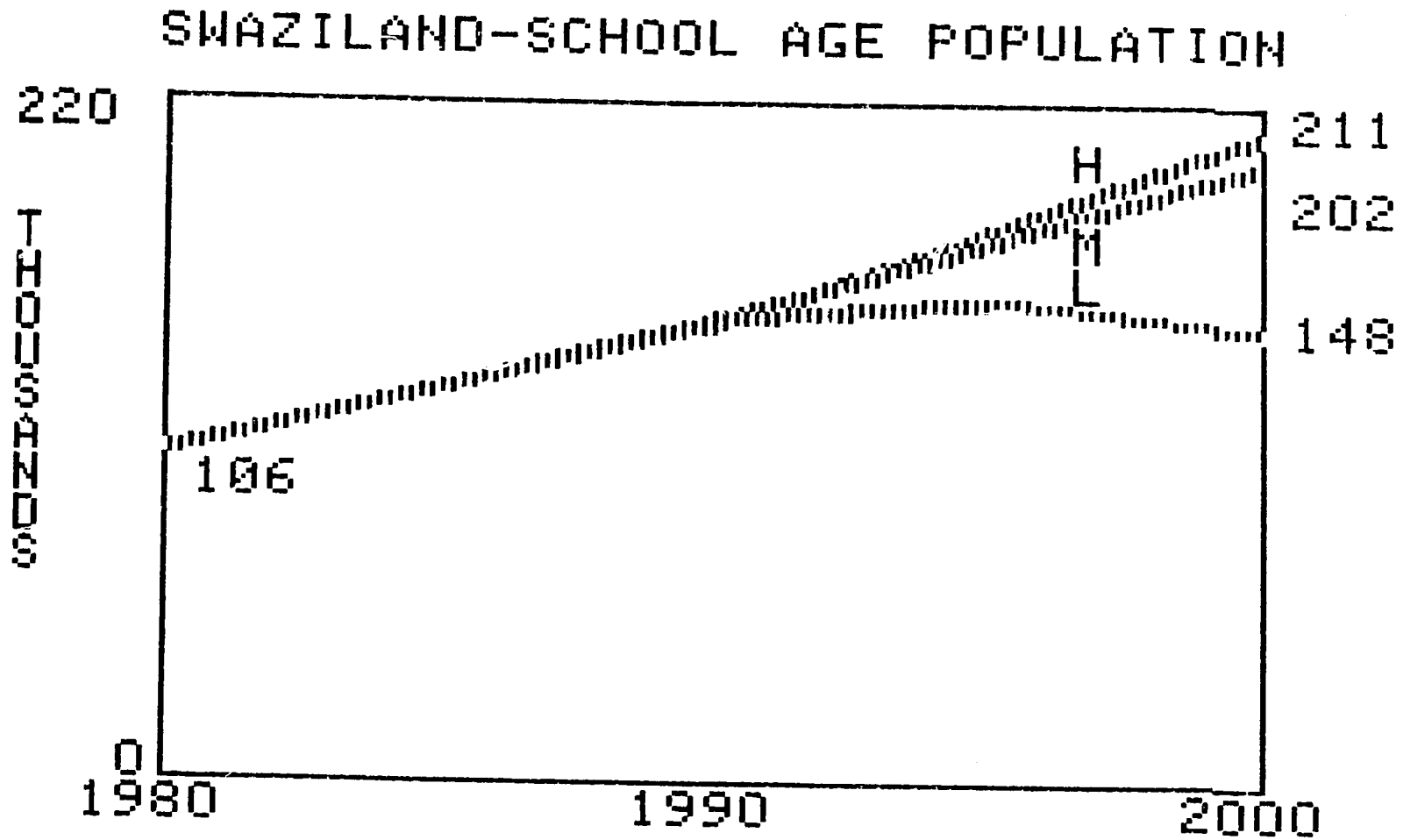
- In the high and medium projections, Swaziland follows the conventional pattern in that a rapidly expanding primary school age cohort promises to pose immense challenges to a government and people which have given highest priority to achieving and maintaining a system of universal primary education.

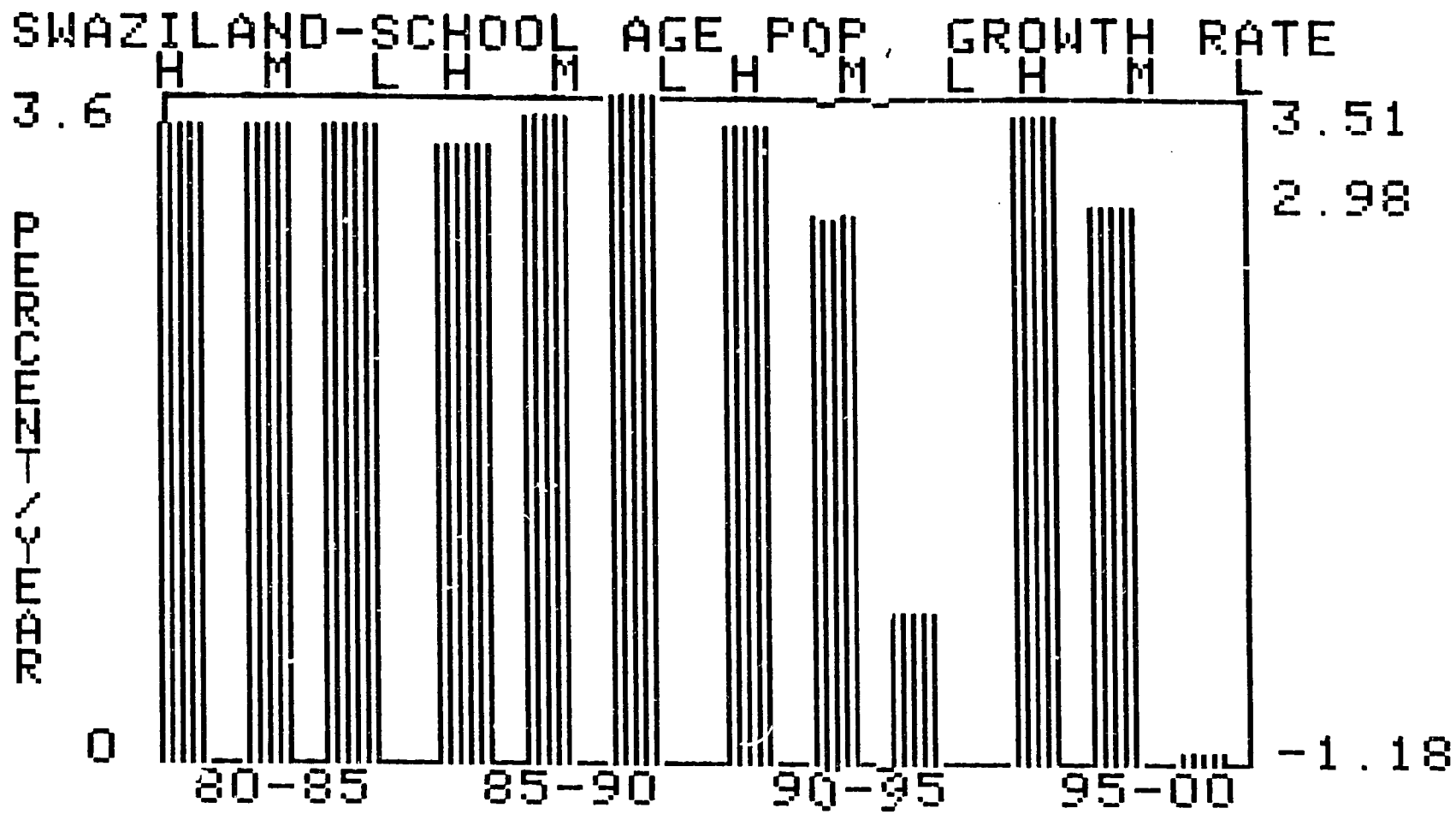
- In the low projection, a different demographic pattern emerges. While a rapid expansion of the primary school age group takes place between 1980 and 1990, after that time at least a temporary levelling off in size occurs for a decade.

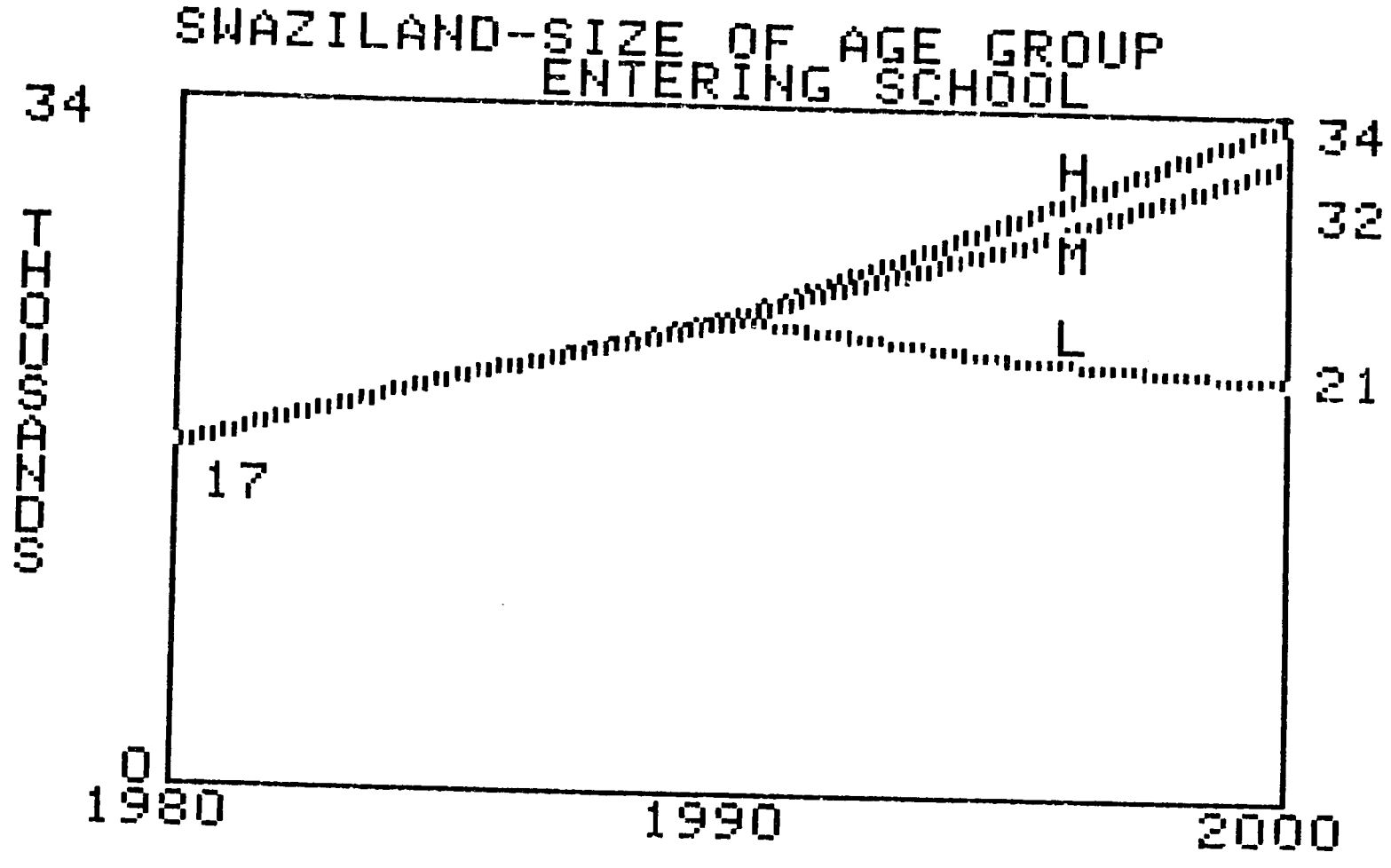
- The Swazi projections also indicate that in countries with comparatively low life expectancies at birth, declining mortality can have an impact on the size of the primary school age cohort. (Though changes in fertility are clearly the most important demographic factors affecting the future size of the primary school age cohort.)

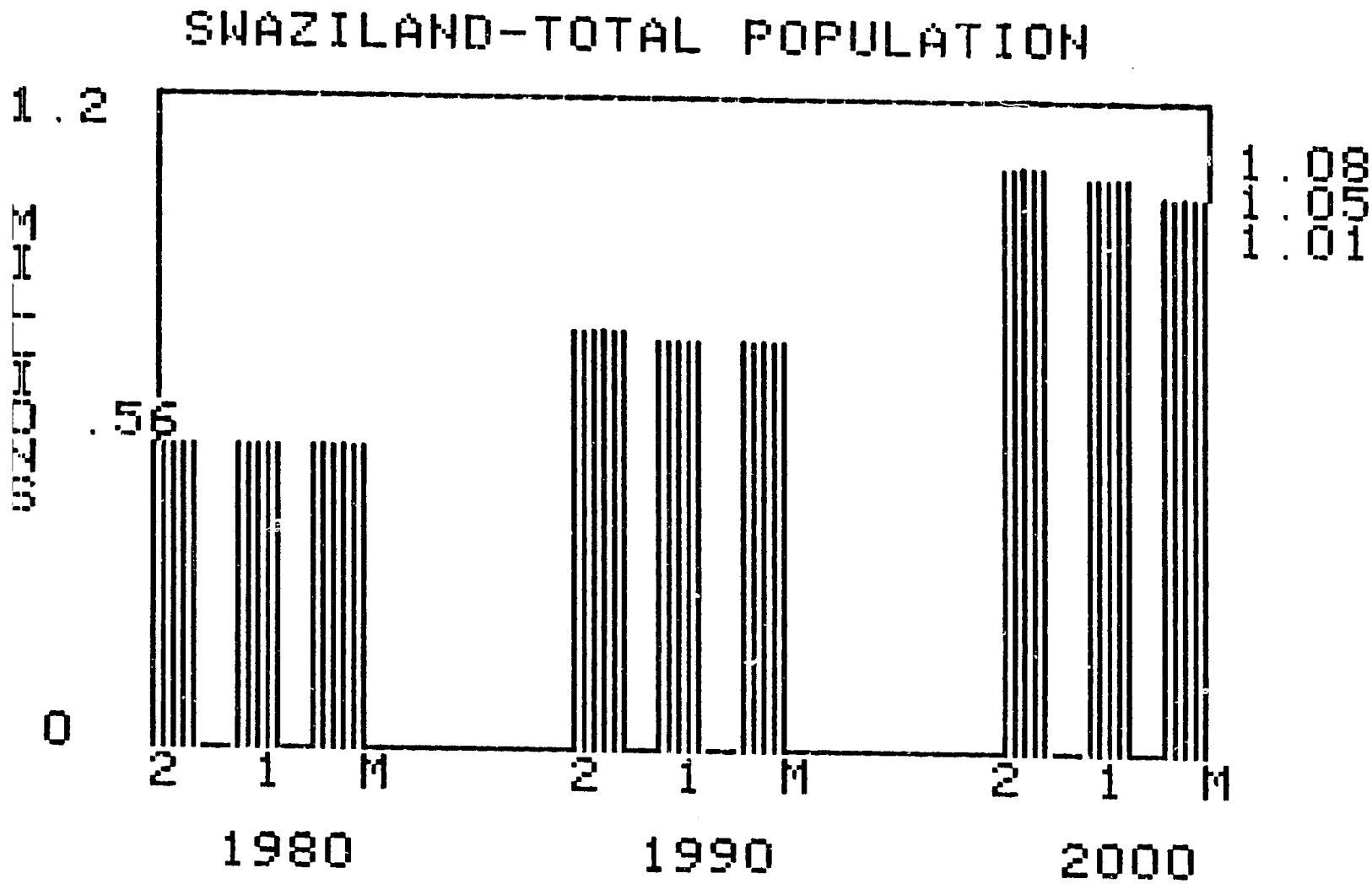

SWAZILAND-TOTAL POPULATION
1.2
MILLIONS
.56
0
1.05
1.01
.88
H
M
L
H
M
L
H
M
L
1980
1990
2000

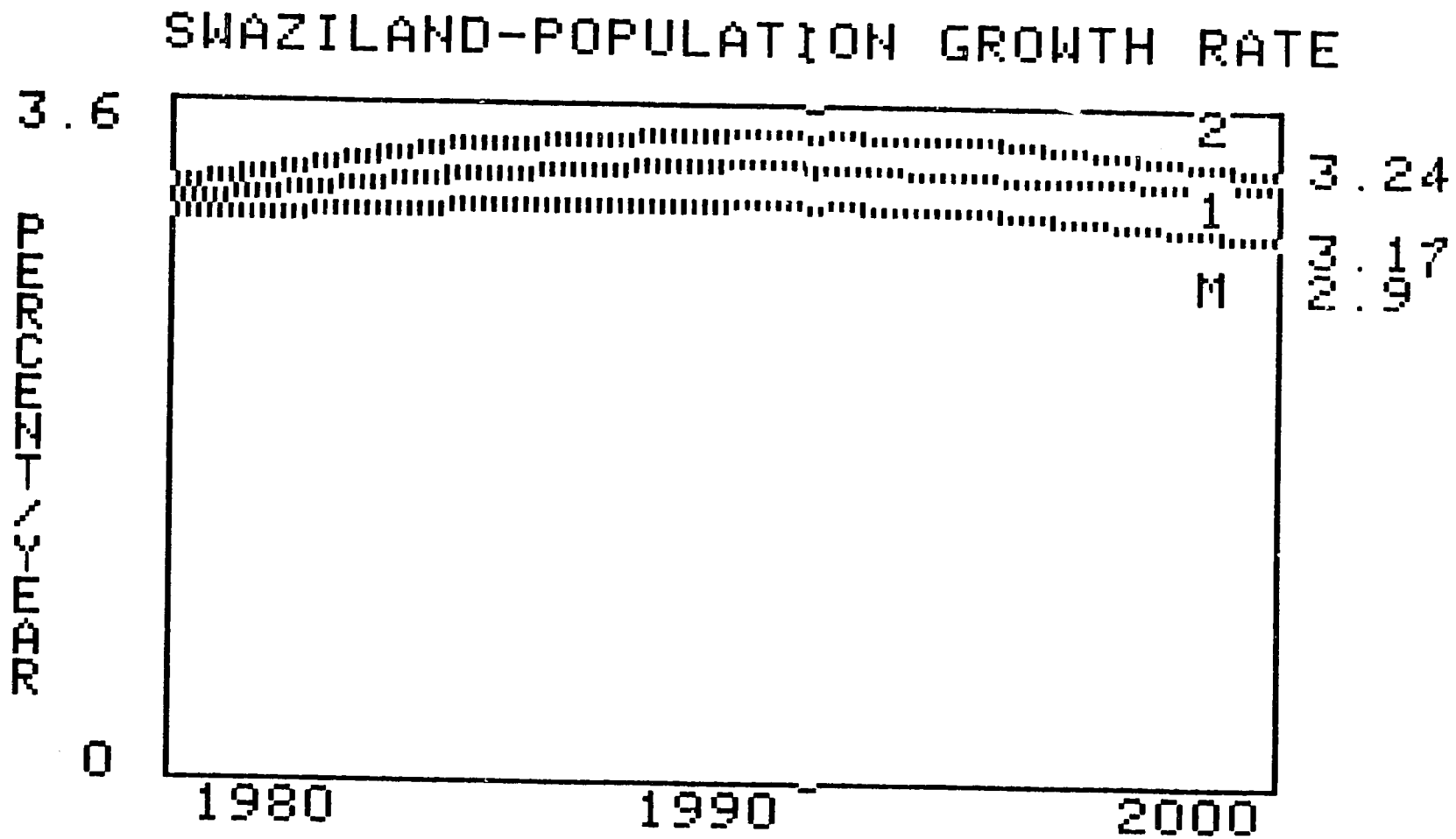

SWAZILAND-POPULATION GROWTH RATE
PERCENT PER YEAR
3.4
0
1980
1990
2000
H
M
L
3.31
2.9
1.84

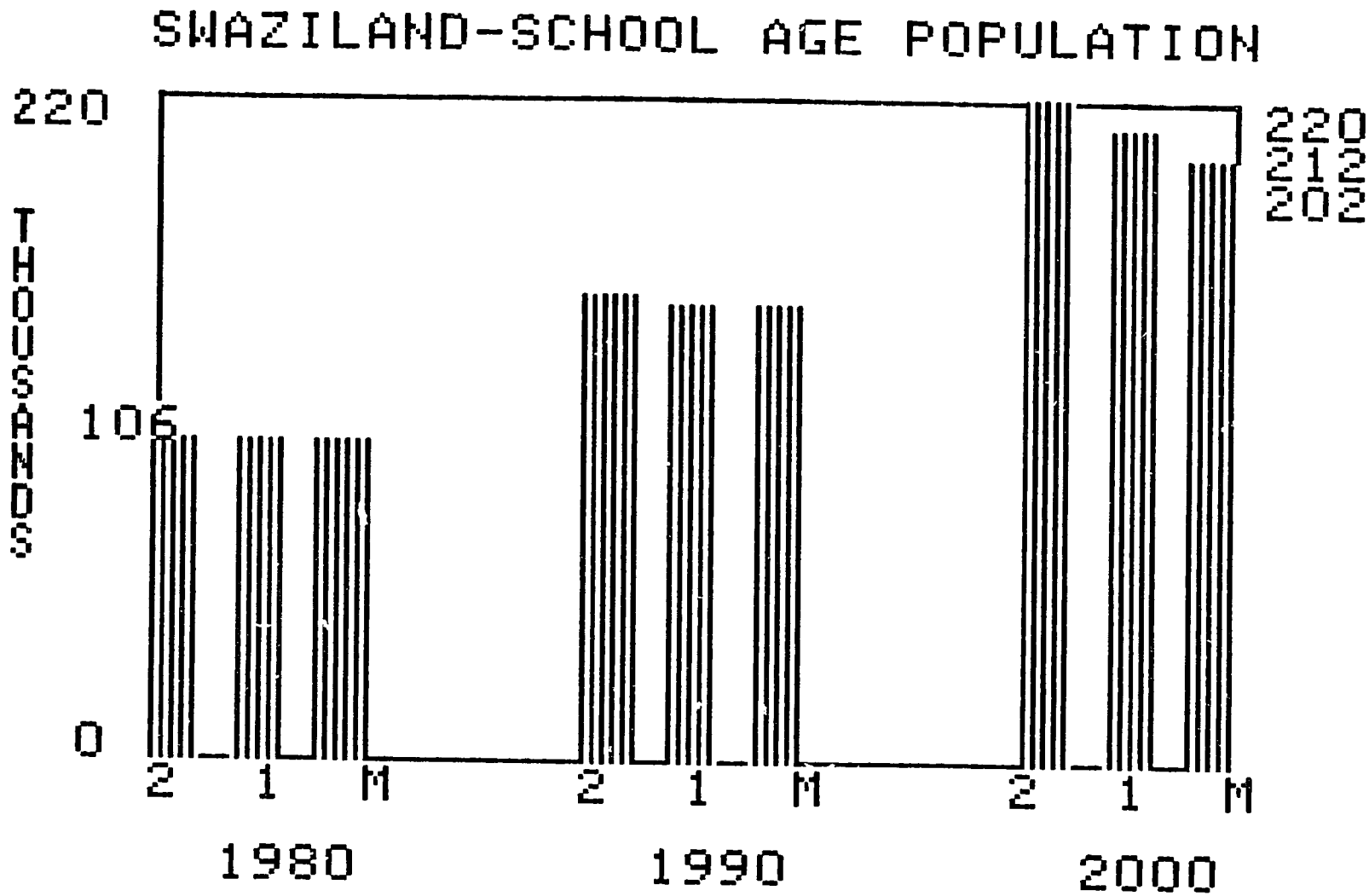

SWAZILAND-SCHOOL AGE POPULATION
220
THOUSANDS
0
1980
1990
2000
211
202
148
106
H
M
L

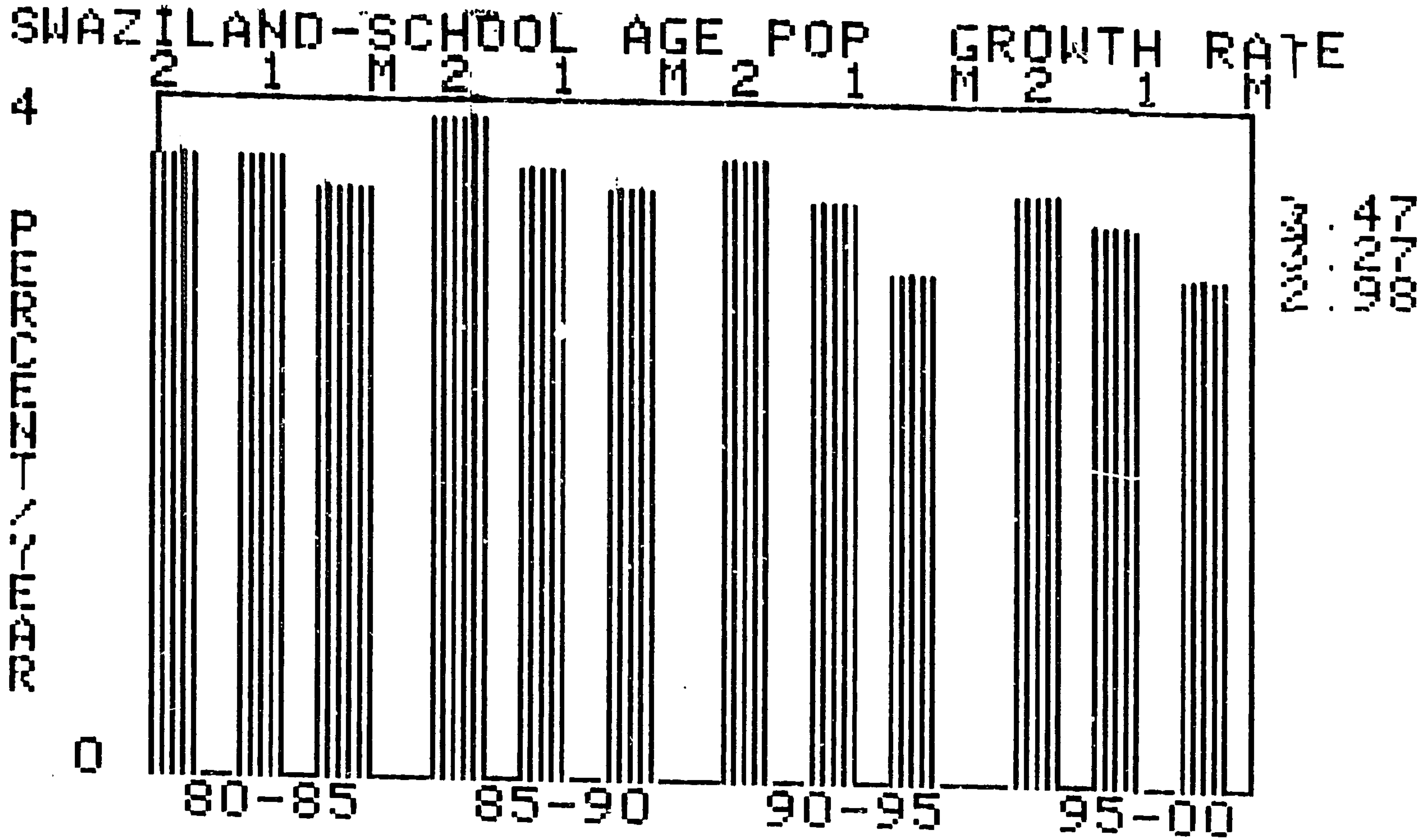

SWAZILAND-SCHOOL AGE POP. GROWTH RATE
H M L H M L H M L H M L
3.6
0
3.51
2.98
-1.18
ANNUAL PERCENT
80-85
85-90
90-95
95-00

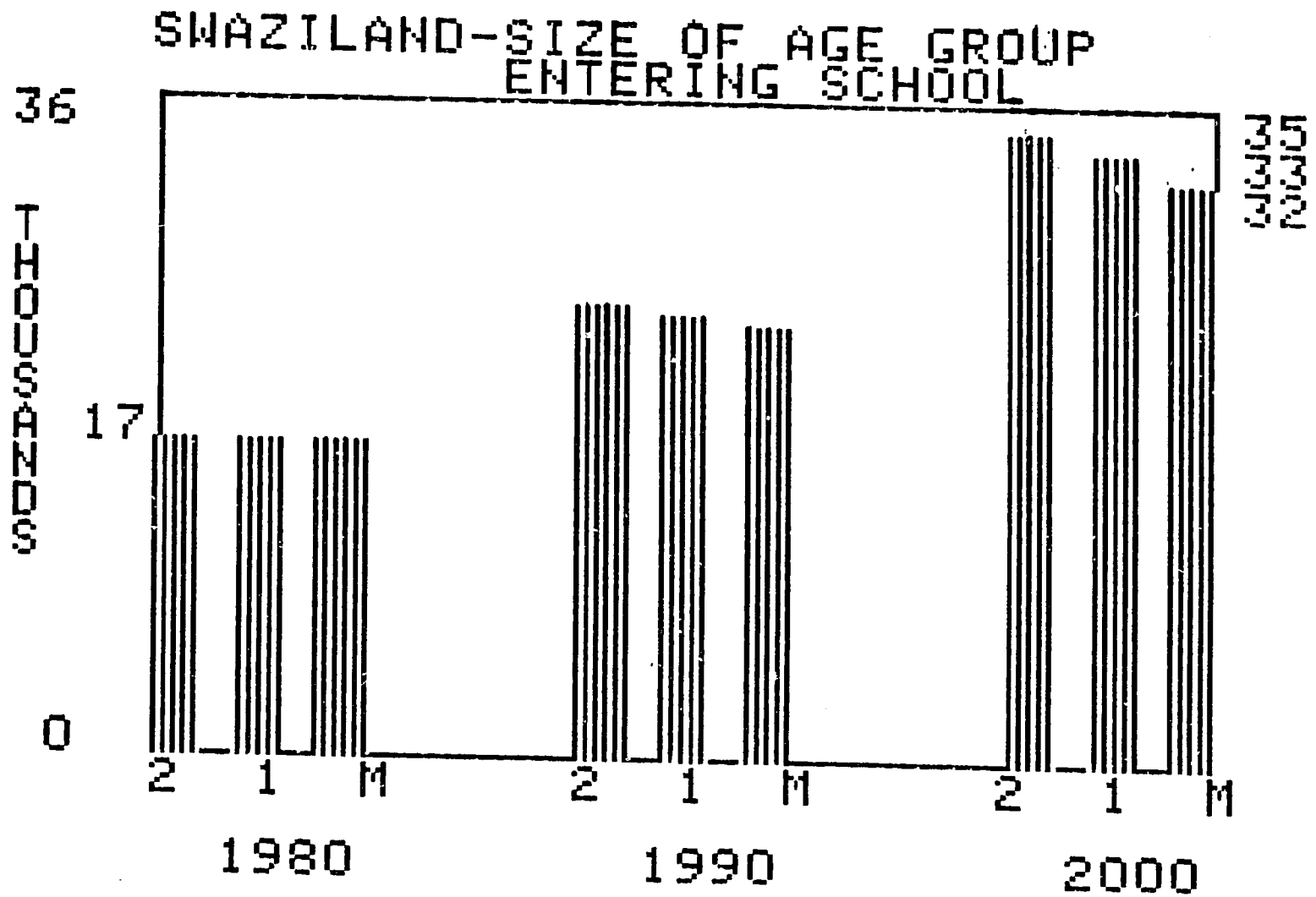

SWAZILAND-SIZE OF AGE GROUP
ENTERING SCHOOL
34
THOUSANDS
0
1980
1990
2000
H
M
L
34
32
21
17


SWAZILAND-TOTAL POPULATION
MILLIONS
1.2
.5
0
1.08
1.055
1.01
2
1
M
2
1
M
2
1
M
1980
1990
2000


SWAZILAND-POPULATION GROWTH RATE
PERCENT-PER-YEAR
3.6
0
1980
1990
2000
2
1
M
3.24
2.17


SWAZILAND-SCHOOL AGE POPULATION
220
106
0
THOUSANDS
2 1 M
2 1 M
2 1 M
1980
1990
2000
220
212
202


SWAZILAND-SCHOOL AGE POP GROWTH RATE
2 1 M 2 1 M 2 1 M 2 1 M
4
0
PERCENT/YEAR
3.47
3.27
2.98
80-85
85-90
90-95
95-00


SWAZILAND-SIZE OF AGE GROUP
ENTERING SCHOOL
36
17
0
THOUSANDS
2
1
M
2
1
M
2
1
M
1980
1990
2000

FOOTNOTES FOR SWAZILAND

1. World Bank, Staff Appraisal Report: Third Education Project in the Kingdom of Swaziland (Washington, D.C.; World Bank, October 1979). pp.2, 3.

2. UNESCO, Statistical Yearbook, 1982, (Paris: United Nations Educational, Scientific and Cultural Organization, 1982), table 3.1.

3. World Bank, p. 5.

4. World Bank, p. 3.

5. World Bank, p. 3.

6. Kurian, George Thomas, Encyclopedia of the Third World, revised edition, (New York; Facts on File, Inc., 1982), p. 1686.

7. UNESCO, table 3.3.

8. Kurian, p. 1686.

9. Kurian, p. 1686.

10. UNESCO, table 4.1.

11. UNESCO, table 4.1

12. UNESCO, table 4.3.

13. World Bank, p. 10.

14. World Bank, p. 10.

15. UNESCO, table 3.4.

16. UNESCO, table 3.4.

17. UNESCO, table 3.4.

18. UNESCO, table 3.2.

19. World Bank, p. 4.

20. World Bank, p. 5..

21. The Futures Group. Swaziland: The Effects of Population Factors on Social and Economic Development. (Washington: The Future Group, 1982), pp 6-8.

Section IV: EGYPT

Primary Education

As in so many other developing countries, leaders in Egypt have viewed educational expansion as a prime road to development. Especially since the 1952 Revolution, efforts have been made to develop the educational system and to make educational opportunity more widely available. In Egypt, a six year primary cycle is followed by three years of preparatory school, three years of secondary school, and, for the minority, university education.

The Government has achieved considerable success in expanding educational opportunities, especially over the past decade. University enrollments increased from 6 percent of the university age group to 15 percent between 1970 and 1978. Secondary school enrollment ratios improved from 28 percent to 37 percent over the same period of time. In the preparatory schools, gains were even more impressive as the enrollment ratio grew from 37 percent of the preparatory school age group to 57 percent between 1970 and 1978. The corresponding increase in the primary school enrollment ratio from 71 percent in 1970 to 73 percent in 1978 to 76 percent in 1980 was more modest.[1] The slower pace of growth was due in large part to an inability to expand primary school classrooms at a rate faster than the growth of the primary school age population.

Important differentials have persisted despite overall improvements. For example, the female primary participation rate was only about 39 percent in 1978. Rural enrollment ratios of 62 percent and 51 percent at primary and preparatory levels respectively are much lower than the corresponding rates of 90 percent and 63 percent in urban areas.[2]

To sustain expansion, total government expenditure on education as a percentage of the Gross Domestic Product grew from 3.8 percent in 1965 to 4.4 percent in 1970-1971, 5.2 percent in 1973, and 5.5 percent in 1978. Should the proportion spent on education remain near 5.5 percent, the economy would have to grow by about 6.5 percent per year to maintain past achievements and attain planned expansion.[3]

The stated goal of the Government of Egypt is to achieve universal enrollment of the 6 to 14 year old age group in a nine year basic education program, including six years of primary school and three years of preparatory school. The target is to achieve enrollment of all six year olds by 1985, full primary enrollment by 1990, and complete enrollment in the 9 year basic education program by 1995.[4]

Demographic Trends

Egypt is a country where fertility dropped for a period, then levelled off. The fertility rate, or the average number of children per woman, dropped from about 6.1 in 1960 to an annual average of 5.15 between 1970 and 1975, but then rose again to an annual average of about 5.23 between 1975 and 1980. The initial drop is attributed to the early success of the family planning program, war conditions which led to a postponement of marriages and childbearing, and changing social and economic conditions, such as greater urbanization and rising educational levels. The subsequent levelling off is attributed in part to changing marriage patterns with the altered military situation and a loss of impetus in the family planning program.

Mortality also declined between 1960 and 1980. Correspondingly, life expectancy at birth increased from about 46 years in 1960 to an average of 56.1 years over the 1975-1980 interval.

The population growth rate in Egypt was thus determined by a combination of declining mortality along with an initial drop in fertility which subsequently levelled off. The rate of natural increase, which is the difference between the birth rate and the death rate, went from about 2.4 percent per year in 1960 to an annual average of 2.51 percent between 1965 and 1970; dropped to 2.29 percent between 1970 and 1975; then rose again to 2.56 percent between 1975 and 1980.[5]

Population Projections

Future growth of the population and the primary school age cohort, then, is largely dependent on whether a renewed decline in the birth rate takes place in Egypt and at what pace. The projections used below to explore future trends all assume that life expectancy for males increases from 54.8 years in 1980 to 62.9 years in 2000 and that life expectancy for females increases from 57.3 years to 66.0 years over the same period of time.

1. High Projection

In Egypt, the fertility rate, or the average number of children per woman, was in the 5.2 - 5.3 range between 1975 and 1980. In the high projection, this rate drops to about a 4-child per woman average by the turn of the century. The size of the total population then increases from 42 million persons in 1980 to 67.2 million in 2000.

Using a six year primary school cycle, the number of 6 to 11 year olds would increase from 6.1 million in 1980 to 9.7 million in 2000 which is equal to a 59 percent increase in 20 years. Between 1980 and 1990, the primary school age population would be growing by 3 percent per year, higher than the rate of

growth of the overall population which would average about 2.4 percent per year. Between 1990 and 2000, however, the school age population would be growing by 1.55 percent per annum, less than the national growth rate of 2.23 percent. The number of entry level age six year olds would increase from 1.1 million in 1980 to 1.7 million in 2000.

2. Medium Projection

In the medium projection, the fertility rate of about 5.2 children per woman between 1975 and 1980 falls to 3.57 between 1995 and 2000. In that case, the population grows from 42 million persons in 1980 to 64.3 million in 2000. The size of the primary school age population, the number of 6 to 11 year olds, increases from 6.1 million in 1980 to 8.6 million in 2000, still an increase of 41 percent over the 20 years. The number of six year olds in the population would increase from 1.1 million in 1980 to 1.5 million in 2000.

Between 1980 and 1990 the size of the primary school age cohort would be growing at 2.63 percent per year, higher than the rate of population growth of 2.27 percent per annum. Between 1990 and 2000, however, the primary school age population would be growing at 0.85 percent per year as opposed to 2.0 percent for the overall population.

3. Low Projection

In the low projection, the fertility rate falls from 5.2 children per woman between 1975 and 1980 to 3.1 children per woman between 1995 and 2000. Under those circumstances the population would then grow from 42 million persons in 1980 to 61.5 million persons in 2000. The size of the primary

school age population would increase from 6.1 million to 8.1 million over the same 20 year period, an increase of 33 percent.

The number of 6 year olds in the population follows an interesting course. The number increases very rapidly from 1.1 million to 1.3 million between 1980 and 1985 but then remains very close to that level until the turn of the century.

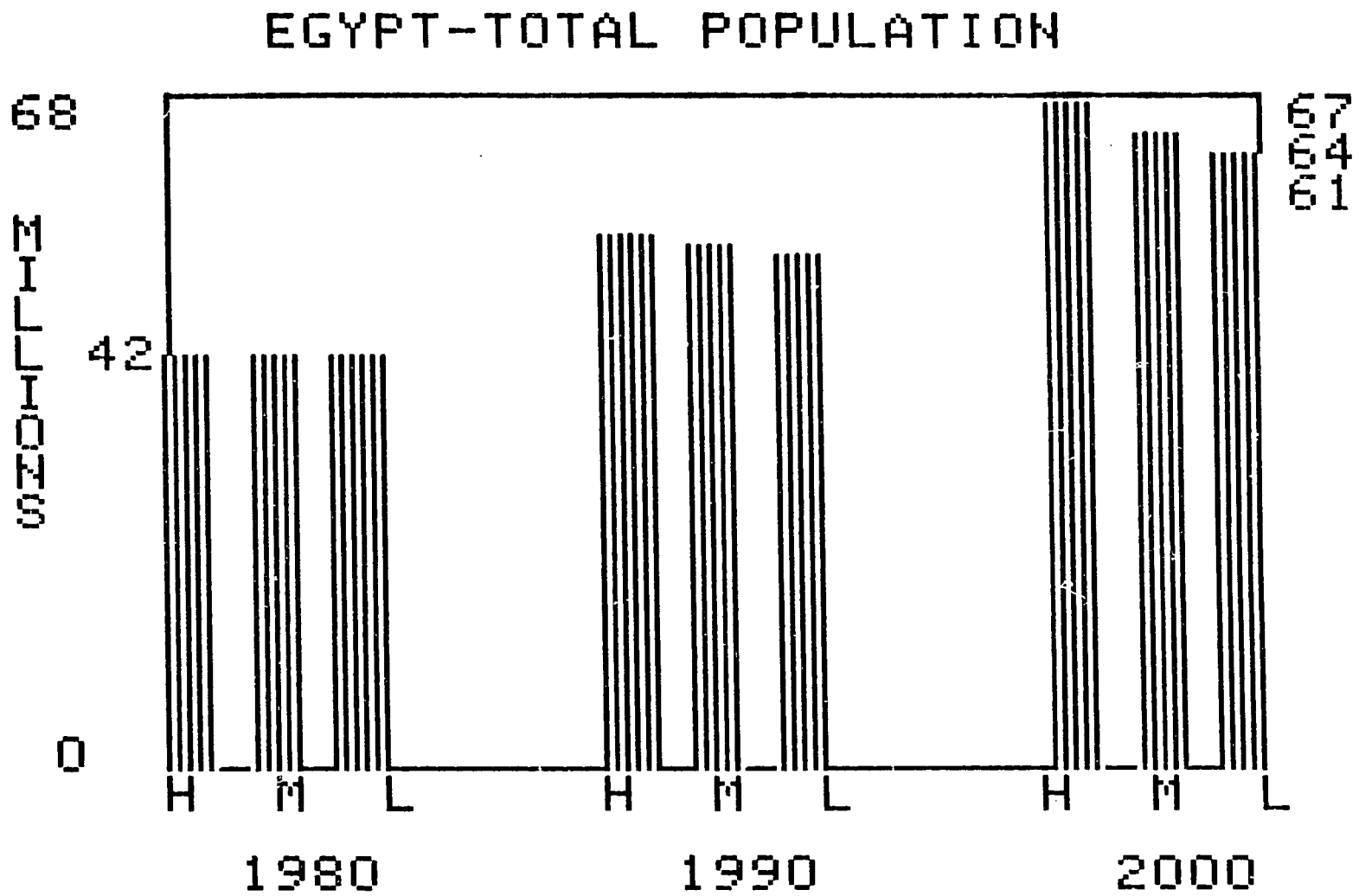
The size of the primary school age population would increase by 2.3 percent per year between 1980 and 1990, but only by 0.2 percent per year between 1990 and 2000. By comparison, the rate of population growth would be 2.1 percent between 1980 and 1990 and 1.7 percent between 1990 and 2000.

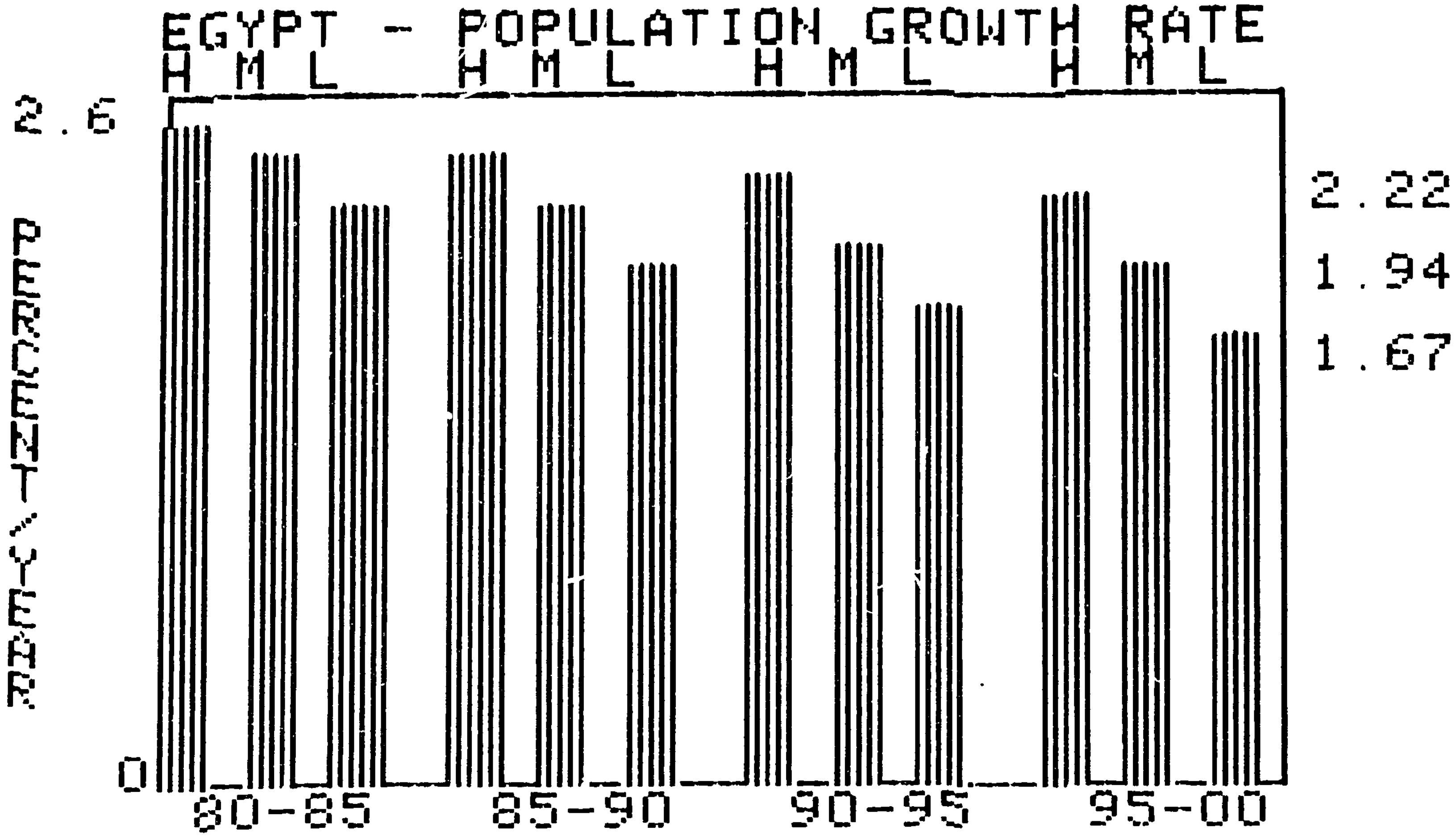
Concluding Remarks:

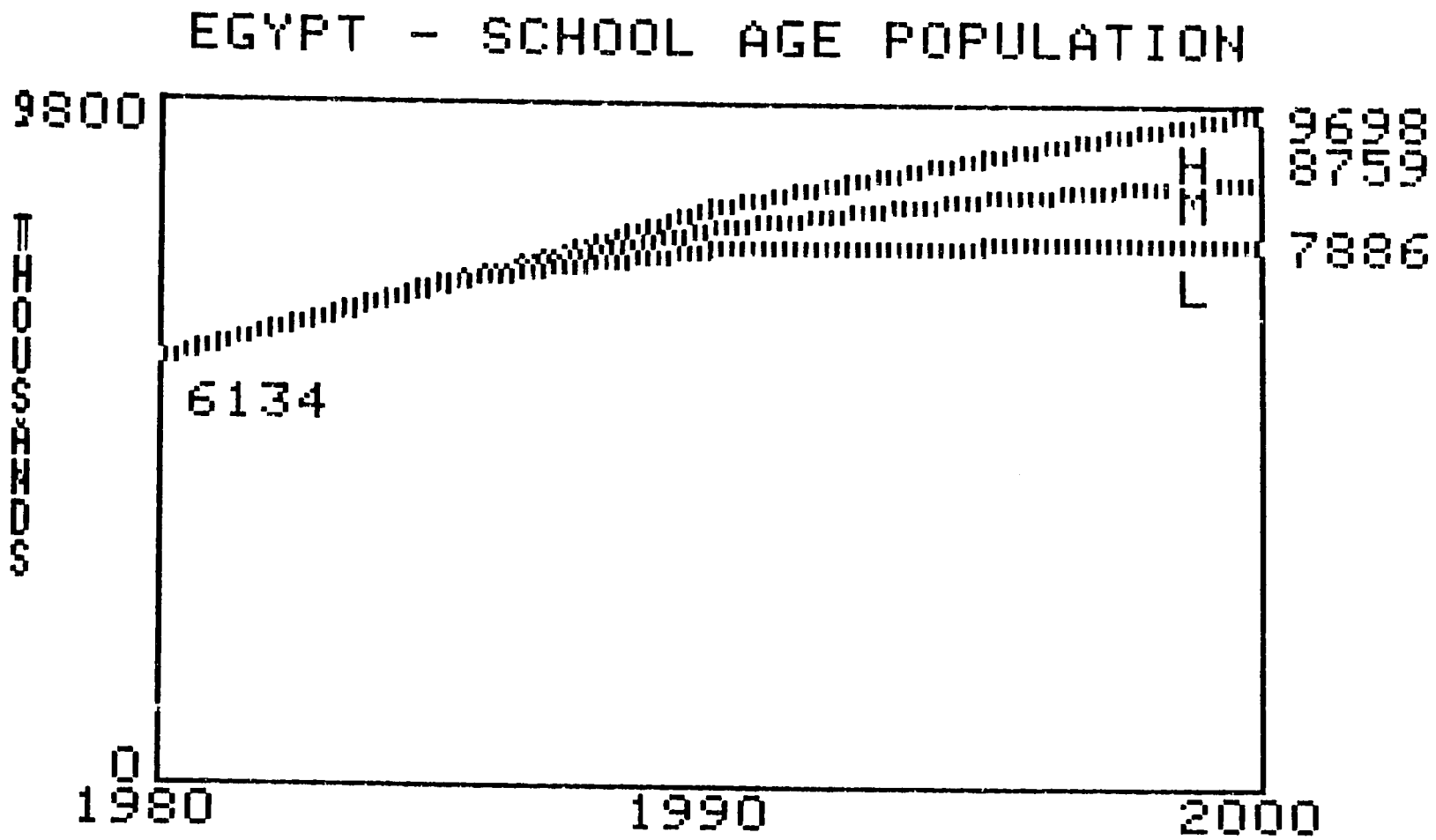
- In all three projections, the size of the primary school age population increases significantly between 1980 and 2000. The rate of assumed fertility decline is nonetheless important as the school age cohort grows by 59 percent under the assumptions in the high projection but only 33 percent under the assumptions in the low projection.

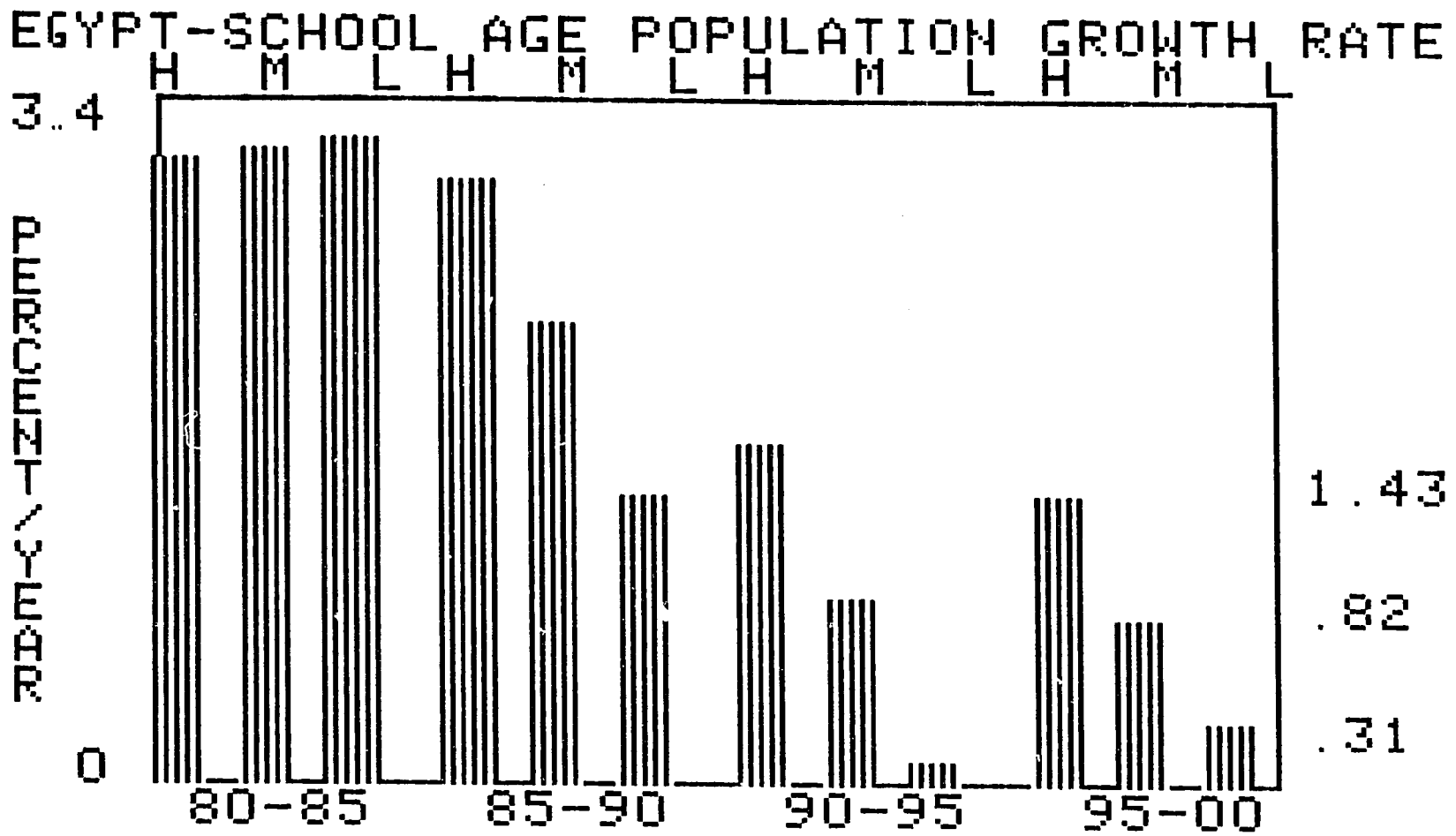
- In all cases, growth is considerably less than in high fertility countries such as Kenya. Egypt represents a country which has already achieved some fertility decline.

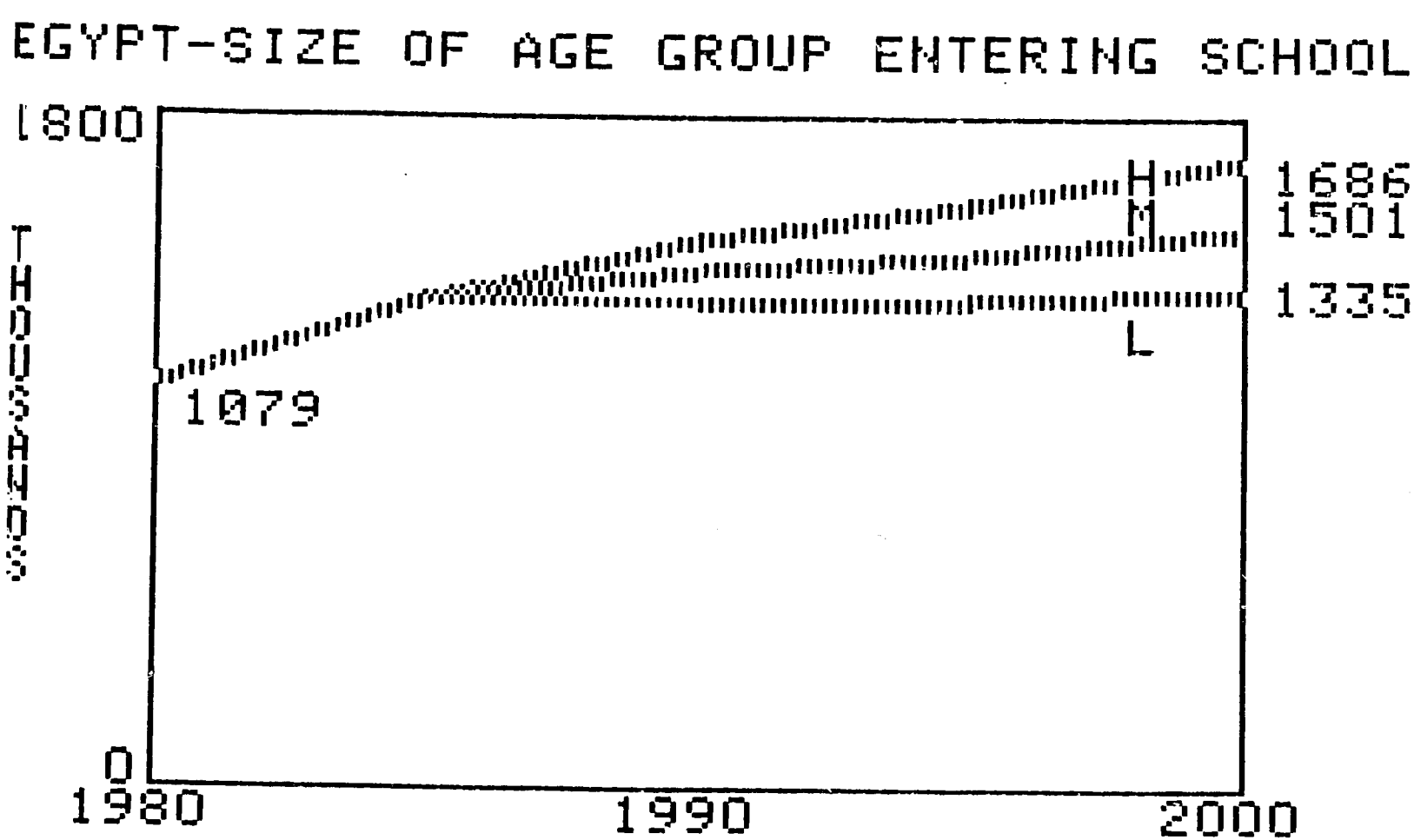
- Egypt illustrates the importance of stable population theory to educational planning. The rate of growth of the school population is higher than the rate of population growth between 1980 and 1990 but between 1990 and 2000 it is considerably lower than the rate of population growth in all three projections.


EGYPT-TOTAL POPULATION
68
MILLIONS
42
0
7
4
1
H
M
L
H
M
L
H
M
L
1980
1990
2000


EGYPT - POPULATION GROWTH RATE
H M L H M L H M L H M L
2.6
0
PERCENT/YEAR
2.22
1.94
1.67
80-85
85-90
90-95
95-00


EGYPT - SCHOOL AGE POPULATION
9800
THOUSANDS
0
1980
1990
2000
6134
9698
8759
7886
H
M
L


EGYPT-SCHOOL AGE POPULATION GROWTH RATE
H M L H M L H M L H M L
3.4
0
ANNUAL PERCENT CHANGE
1.43
.82
.31
80-85
85-90
90-95
95-00


EGYPT-SIZE OF AGE GROUP ENTERING SCHOOL
1800
THOUSANDS
0
1980
1990
2000
H
M
L
1686
1501
1335
1079

FOOTNOTES FOR EGYPT

1. World Bank. Report and Recommendation of the President of the International Development Association to the Executive Directors on a Proposed Development Credit to the Arab Republic of Egypt for a Third Education Project. (Washington: World Bank, 1980), p. 9.

2. World Bank. Third Education Project, pp. 9-10.

3. World Bank. Some Issues in Population and Human Resource Development in Egypt. (Washington: World Bank, 1981), p. 101. World Bank. Third Education Project, p. 12.

4. World Bank. Third Education Project, p. 10.

5. United Nations. Department of International Economic and Social Affairs. World Population Prospects as Assed in 1980. (New York: United Nations, 1981), Tables A-2; A-6; A-9; A-12; A-15. The Futures Group. Egypt: The Effects of Population Factors on Social and Economic Development. (Washington: The Futures Group, 1981), pp 6-7.

Section V: SRI LANKA

The Primary School System

Education in Sri Lanka is free, universal and compulsory for children ages 5-15. The primary school program, which was created as part of a general educational reform effort in 1970, consists of six years with enrollment beginning at age 5.[1] Pre-primary education is very rare and no formal program exists. Sex discrimination is not practiced with the result that girls represent nearly half the primary school enrollment.[2] The medium of instruction in Sinhala or Tamil depending on the region, but English is a compulsory language beginning with the third primary grade.[3]

Control of education is centralized in a Ministry of Education and is exercised through 25 education districts. In 1978, the total education budget was 933.6 million Rupees, which represented nearly 6 percent of total government expenditures and 2.2 percent of the GNP of that year.[4] Both of the percentage numbers are down significantly from their 1970 levels. In that year the educational budget, though smaller in real terms, represented 13.6 percent of total government expenditures and 4.0 percent of the GNP.[5] The proportion of current education expenditure dedicated to primary education was about 61 percent, the last year that separate statistics were kept.[6] In 1978, 93 percent of the current expenditures went to primary and secondary education combined.[7]

According to UNESCO figures, in 1978 there were 8,712 schools, 1.94 million pupils and 60,835 teachers in the primary school system.[8] Those figures imply a national student per school rate of slightly over 220 to 1 and a student-teacher ratio of approximately 32 to 1. Currently private schools account for about 5 percent[9] of the primary school population. Historically rates were much

higher until 1960 at which point the government nationalized most of the private denominational schools and made them part of the state system.[10]

Student enrollment rates are high; for example in 1978 net enrollment in the 5-14 age group was 86 percent.[11] This ranks the country 31st in the world in terms of adjusted school enrollment ratios.[12] As a result of its commitment to education, 54 percent of the population over 15 has completed primary schools and Sri Lanka has an adult literacy rate of 84 percent, seventh highest in Asia.[13] It is the goal of the government to increase both the enrollment and literacy rates in the future.

Demographic Trends

Sri Lanka is one of those interesting cases where both fertility and mortality have dropped substantially since World War II, and where, despite some recent evidence that the fertility decline might have slowed or stopped, most analysts believe that the decline will continue into the future.

According to United Nations estimates, the fertility rate dropped from an average of 5.7 children per woman around 1950 to 3.7 children per woman in 1980. The birth rate, the number of births per 1000 population over the course of a year, fell from 38.5 to 27.6 over the same period of time.

The decline in mortality has been even more impressive. Due largely to public health measures instituted over the past 30 years, including an effective campaign to eradicate malaria, life expectancy at birth increased from 56.6 years around 1950 to 65.7 years in 1980. The latter figure makes Sri Lanka more comparable to the developed nations of the world than other developing nations.

Because the birth rate dropped faster than the death rate, the rate of natural increase also declined over this period of time from about 2.7 percent

per year in 1950 to about 2 percent per year between 1975 and 1980.[14] (The rate of population growth of about 1.7 percent per year between 1975 and 1980 was actually lower than the rate of natural increase due to outmigration, largely of workers to the oil producing nations of the Middle East.) The projections used in the present study follow the lead of the 1980 projections prepared by the United Nations and assume 0 net migration in the future.

Population Projections

Sri Lanka, then, is a key country in the present study because it represents a nation where fertility has been declining for a long period of time and where further decline is anticipated in the future. Three projections are again used to look at the impact of a changing demographic situation on the primary school age population. All three projections incorporate an increase in life expectancy at birth from 65.7 years in 1980 to 70.7 years in 2000.

1. High Projection

In the high projection, the fertility rate drops from a 3.87 child per woman average over the 1975-1980 period to a 2.69 child per woman average between 1995 and 2000. Under this projection, the population still experiences significant growth, rising from 14.8 million persons in 1980 to 21.6 million persons in 2000. This represents a 46 percent increase in the population over the 20 year period.

The size of the primary school age population, those children aged 5 to 10, would rise from 2.1 million in 1980 to 2.7 million in 2000. The school cohort would grow by 1.7 percent per year between 1980 and 1990 and 1 percent per year between 1990 and 2000. The rate of growth of the total population, by

comparison, would be 2.1 percent between 1980 and 1990 and 1.7 percent per annum between 1990 and 2000.

The number of 5 year olds would increase from 344,000 in 1980 to 438,000 in 1990 and 456,000 in 1995, but would decline thereafter.

2. Medium Projection

In the medium projection, the fertility rate falls somewhat more rapidly from a 3.87 child per woman average between 1975 and 1980 to a 2.4 child per woman average between 1995 and 2000. The population would then grow from 14.8 million in 1980 to 18 million in 1990 and 21 million in 2000. Between 1980 and 2000, the population of Sri Lanka would increase by about 42 percent.

The number of 5 to 10 year olds would increase from 2.1 million in 1980 to 2.4 million in 1990 and 2.5 million in 2000. Again, were the projection continued further into the future, the cohort would actually decline in size over the ensuing two decades. The number of 5 year olds would increase from 344,000 in 1980 to 424,000 in 1995 but would steadily decline after that time.

Because of past fertility decline, the rate of growth of the school age population will be less than the rate of population growth between 1980 and 1990, 1.5 percent versus 2 percent to be exact. Between 1990 and 2000, the school age population will be growing at only .4 percent per annum as against 1.5 percent for the overall population.

3. Low Projection

In the low projection, the fertility rate drops to a 2.14 child per woman average over the 1995-2000 period. Such a rate is slightly below replacement level fertility.[15] The population would then grow from 14.8 million in 1980 to

17.8 million in 1990 and 20.4 million in 2000. Even under the low projection, the population grows by 38 percent between 1980 and 2000.

In this case, the change in the size of the primary school age population is quite edifying. The size of this cohort would increase from 2.09 million persons in 1980 to 2.34 million children in 1990. Thereafter, the size of the cohort would actually decline in size, dropping to 2.31 million persons by 2000. By 2005, the size of the cohort would be virtually the same as it was in 1980. Under the low projection, then, Sri Lanka would witness a temporary increase in the size of the primary school age cohort, followed by a decline back to near present levels.

The number of entry age 5 year olds further traces this progression. The number of 5 year olds would increase from 344,000 in 1980 to 371,000 in 1985, and 403,000 in 1990, but would then drop to 395,000 in 1995; 373,000 in 2000, and 341,000 in 2005.

The size of the primary school age cohort would be growing by 1.2 percent per year between 1980 and 1990, as opposed to a growth rate of 1.9 percent for the total population. Between 1990 and 2000, however, the growth rate for the school age population would be negative, while the overall population would be growing by 1.3 percent per year.

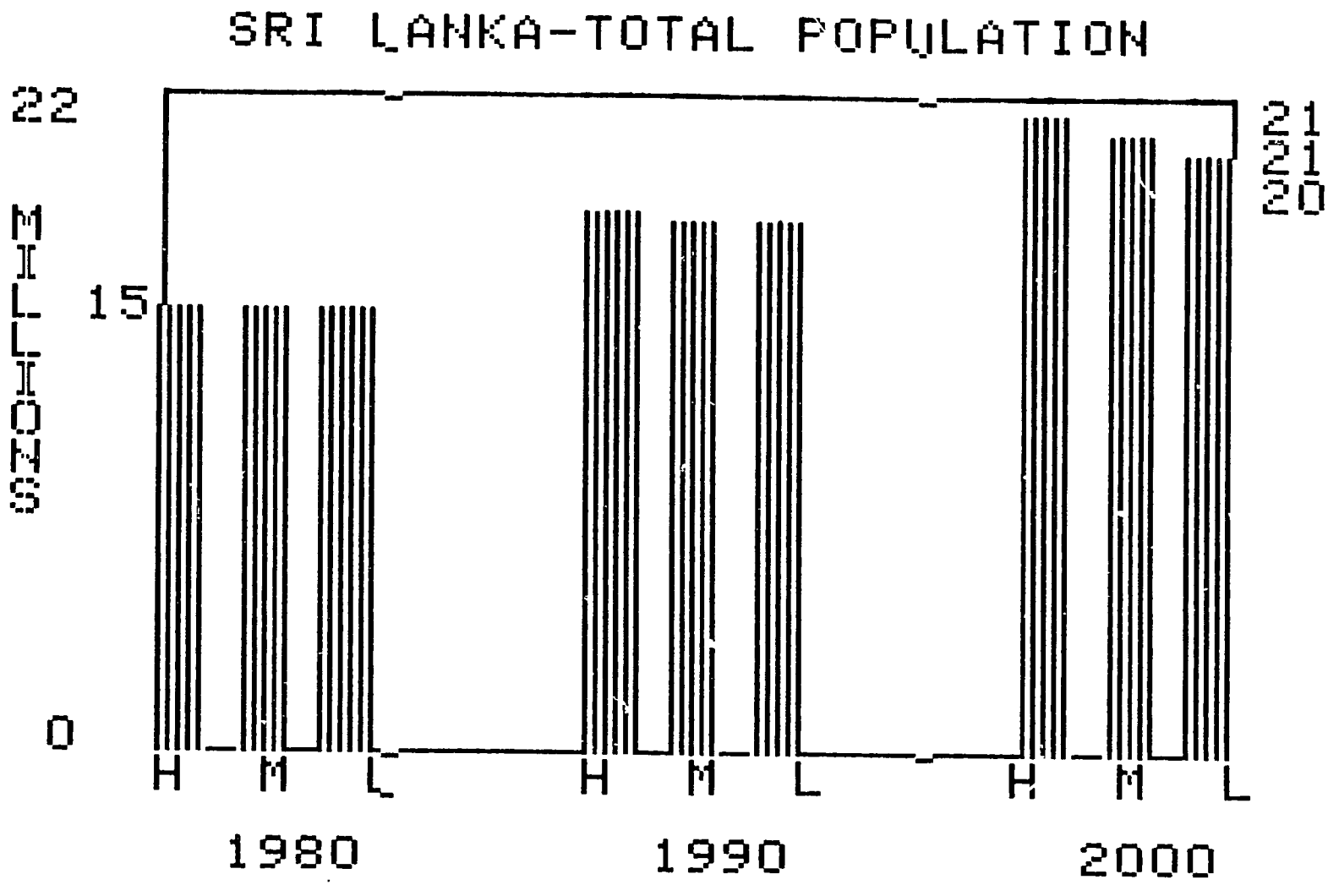
Concluding Remarks

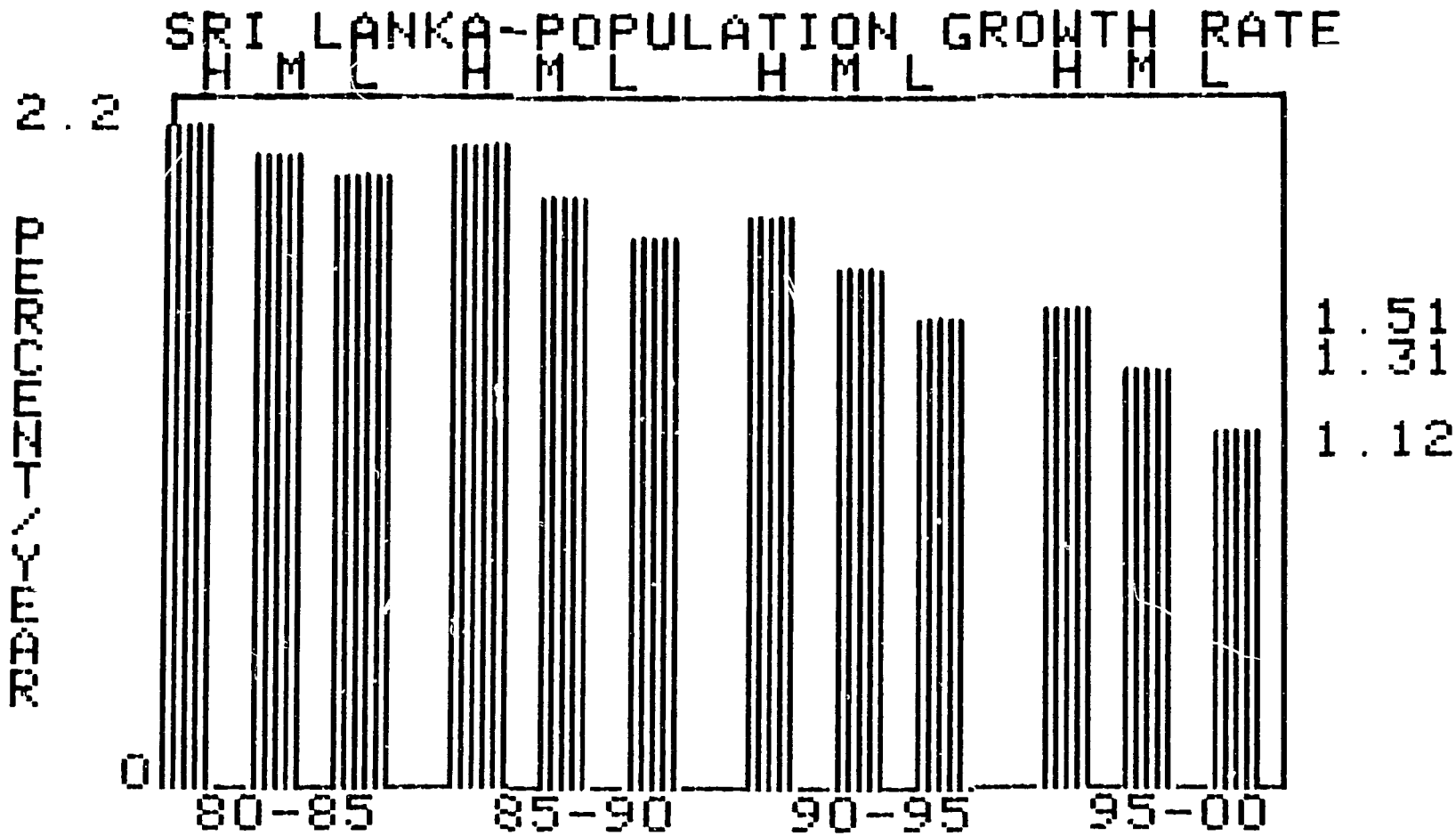
As a country which has experienced historically declining fertility, Sri Lanka is an especially important example in the present study.

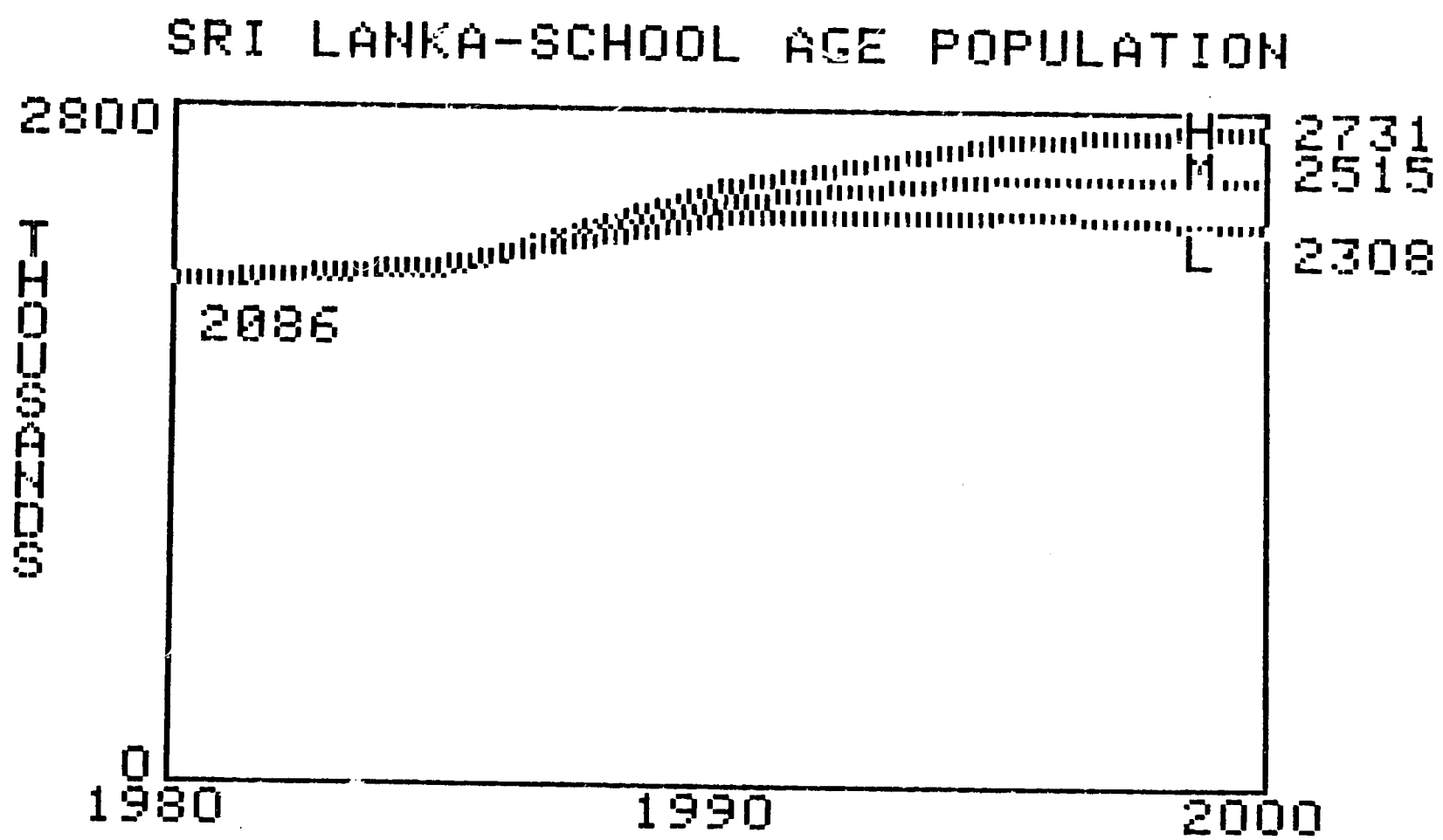
- In the high and medium projections, the size of the primary school age group continues to expand until 2000, although growth is much more rapid between 1980 and 1990 than it is between 1990 and 2000. After 2000, the cohort will remain stable or decline modestly in size over the ensuing two decades.

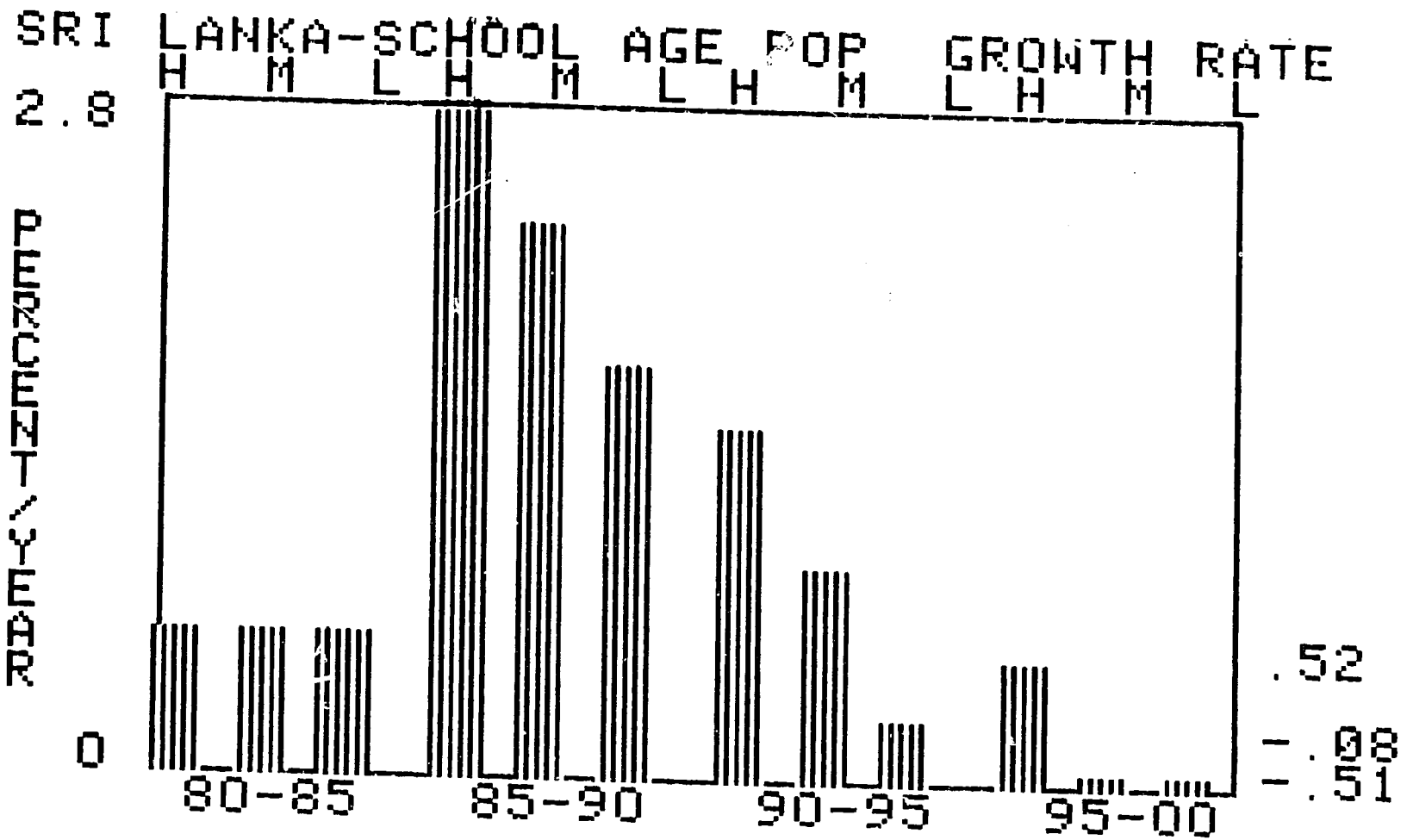
- Under the low projection, the primary school age population will expand only until 1990, after which it will begin to decline. By 2005, the size of the primary school age cohort will be about the same as it is today.

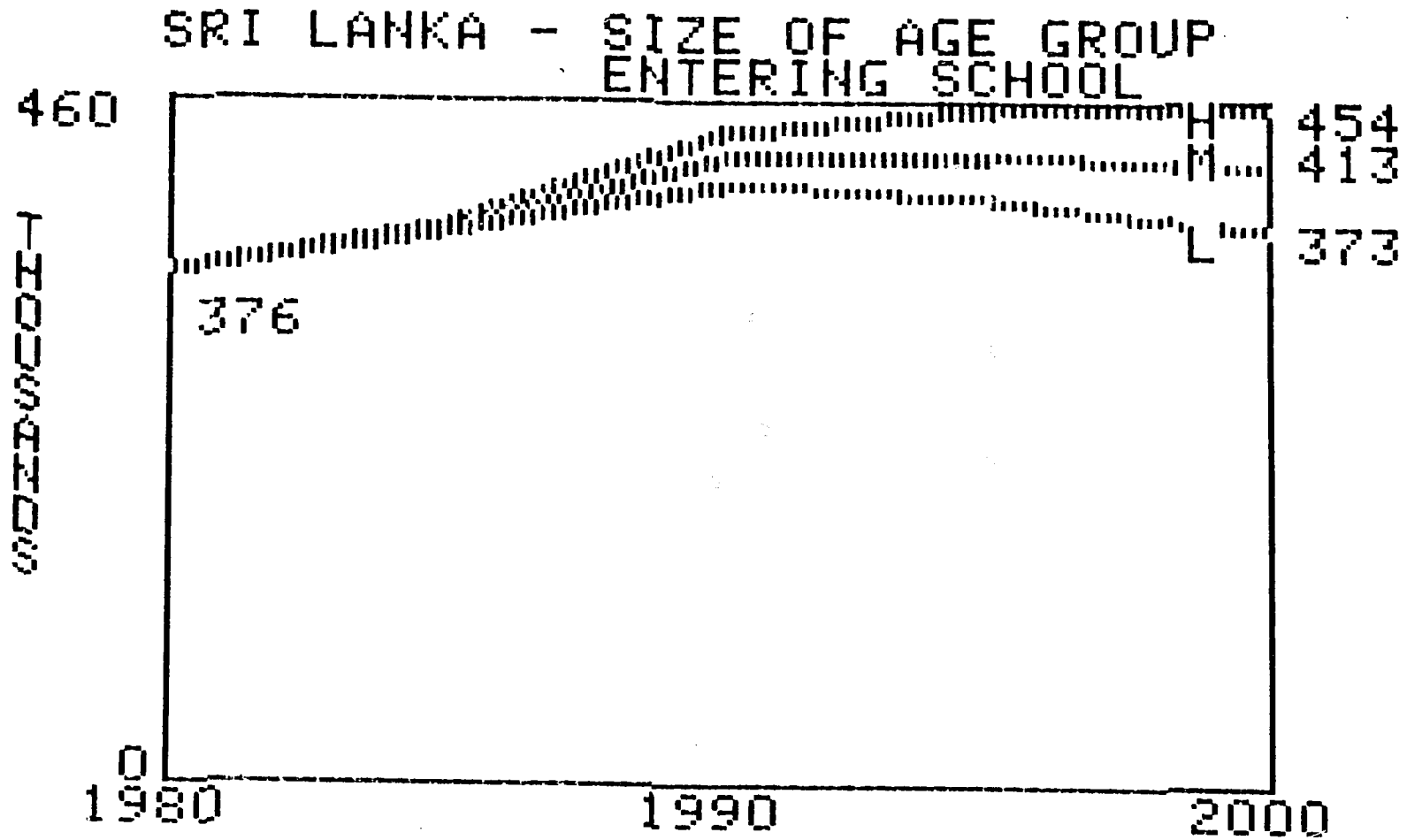
- These patterns are radically different than those which typify a country such as Kenya. A key question which will be addressed below is to what extent Sri Lanka is atypical or representative of the developing world.


SRI LANKA-TOTAL POPULATION
22
15
0
MILLIONS
1980
1990
2000
H
M
L
H
M
L
H
M
L


SRI LANKA-POPULATION GROWTH RATE
H M L H M L H M L H M L
2.2
0
ANNUAL PERCENTAGE
1.51
1.31
1.12
80-85
85-90
90-95
95-00


SRI LANKA-SCHOOL AGE POPULATION
2800
0
THOUSAND
2086
H
M
L
2731
2515
2308
1980
1990
2000


SRI LANKA-SCHOOL AGE POP GROWTH RATE
H M L H M L H M L H M L
2.8
0
PERCENT-YEAR
80-85
85-90
90-95
95-00
.52
1.08
1.51


SRI LANKA - SIZE OF AGE GROUP
ENTERING SCHOOL
460
THOUSANDS
0
376
H
M
L
454
413
373
1980
1990
2000

FOOTNOTES FOR SRI LANKA

1. UNESCO, Statistical Yearbook, 1982. (Paris; United Nations Educational, Scientific and Cultural Organization, 1982). Table 3.2.

2. Kurian, George. Encyclopedia of the Third World (New York; Facts on File, Inc., 1982). p. 1643.

3. Kurian, George, p. 1643.

4. UNESCO, table 4.1.

5. UNESCO, table 4.1.

6. UNESCO, table 4.3.

7. UNESCO, table 4.3.

8. UNESCO, table 3.4.

9. World Bank, Education: Sector Policy Paper, (Washington, D.C..; World Bank, April 1980), Annex 16. The approximate figure was confirmed by an official of the Sri Lanka Embassy, Washington, D.C. in a private conversation in February, 1983.

10. Kurian, George, p. 1643.

11. Kurian, George, p. 1643.

12. Kurian, George, p. 1643.

13. Kurian, George, p. 1643.

14. United Nations. Department of International Economic and Social Affairs. World Population Prospects as Assessed in 1980. (New York: United Nations, 1981), Tables A-2; A-6; A-9; A-12; A-15, The Futures Group. Sri Lanka: The Effects of Population Factors on Social and Economic Development. (Washington: The Futures Group, 1980), pp. 6-7.)

15. Replacement level fertility means that eventually the population will reach zero population growth. After a nation attains replacement level fertility, the population will nonetheless continue to grow for an additional 40 to 50 years due to an inbuilt population momentum. In the case of Sri Lanka, if replacement level fertility were attained by 1995, the population would keep growing until about 2035. If fertility levels had been slightly below replacement levels, the total population would actually begin to decline modestly in size at that time.

Section VI: ECUADOR

The Primary School System

The Ecuadorian educational system is comprised of three levels; a) the primary level of six years, b) the secondary level of six years, and c) higher education. Elementary education is compulsory for children ages 6-11, and free in the public schools.[1] The government hopes to achieve near universal enrollment by 1984.[2] To this end, the latest five year plan calls for an 11 percent real increase in per pupil expenditures (from $173 to $192) between 1980 and 1984.[3]

The primary school system has increased substantially in recent years. The number of school children entering primary education grew from 1.12 million in 1971 to 1.32 million in 1977, an annual increase of nearly 3 percent.[4] Between 1970 and 1978 the number of primary schools increased by 40 percent and the number of teachers by 45 percent.[5] Nationally, in 1978, there was an average of 129 students and 3.5[6] teachers per school giving a student teacher ratio of nearly 37 to 1.

As a result of these achievements, despite dropout rates of nearly 45 percent,[7] an estimated 85-95 percent of the urban population is literate.[8]

The aura of these successes is diminished somewhat by the disparities that exist between urban and rural areas. Improvements have been made over time but rural areas still typically lag far behind their urban counterparts in levels of educational achievement despite the fact that over 80 percent of the schools are located there.[9] For example, whereas the typical urban school has 8.7 teachers, the average rural school has only 2.3.[10] Nearly 100 percent of urban children matriculate as compared to 67 percent of rural children.[11] And while the retention rate in urban areas is 67 percent, for the countryside, the figure is a

mere 25 percent.[12] The result is a rural literacy rate of only 65 percent.[13] The situation is particularly acute for rural females, an estimated 56 percent of whom are illiterate.[14].

Perhaps the major barrier to rural education is the fact that a large portion of the population is native and does not speak Spanish. At this time few educational courses or materials have been developed in idioms the Indians can understand. In addition, the indigenous family cultures involve motivation and behavior systems alien to those employed in Spanish. However, in the past, populations have been successful in assimilating useful modern methods and a concentrated attempt to develop appropriate curricula and materials could help meet the ambitious government plans of 99.5 percent rural enrollment by 1984.

Demographic Trends

Despite a decline of some 17 percent since 1950, Ecuador's birth rate remains high, at approximately 40 births each year per thousand population. The total fertility rate (the average number of births per woman during her lifetime) is estimated to be about 6.2.

Mortality has fallen considerably faster than fertility in the last three decades, a tribute to the progress Ecuador has made in the field of public health. The infant mortality rate (number of deaths per 1000 children less than one year of age) is about 71. Mortality of children under the age of five, however, still accounts for 45 percent of all deaths. The mortality rate (number of deaths per 1000 population) has been nearly halved from 19.4 in 1950 to 10 in 1980. Life expectancy at birth consequently rose from 47 years to 61 years during the same period.

The combination of only a slight fall in fertility and a much larger drop in mortality has resulted in an acceleration of population growth, from a rate of 2.8 percent in 1950-1955 to 3.0 percent today. The population more than doubled from 3.3 million in 1950 to about 8 million in 1980, and, as stated earlier, the present rate of growth, if continued, would double the population again to over 16 million people by the year 2002.

Ecuador's population is unevenly divided among three regions: the Costa, the Sierra, and the Oriente. According to the 1974 census about 49 percent of the population lives in the Costa, 48 percent in the Sierra, and 2.6 percent in the Oriente. About 44 percent of Ecuador's population is classified as urban. Rural outmigration continues at a high rate, particularly from the Sierra region to the Costa region and from rural to urban localities within both regions.[15]

Population Projections

The projections for Ecuador are used to illustrate another point about the primary school age population. The growth of that group of children can vary significantly from one region of the country to another. In Ecuador, separate population projections were run for the urban and rural populations.

In both cases, life expectancy at birth for males is assumed to increase from 61.3 years over the 1980-1985 period to 65.5 years between 1995 and 2000. Life expectancy at birth for females increases from 63.6 years during the 1980-85 interval to 67.8 years between 1995 and 2000. Fertility is much lower in the urban areas. The fertility rate is assumed to drop from a 4.6 child per woman average during 1980-85 to a 4 child per woman average over the 1995-2000 interval. The fertility rate in rural areas drops from 7.6 children per woman to 6.5 children per

woman over the same period of time. Approximately 1.5 percent of the rural population moves to the cities each year.

As a consequence of migration and natural increase, the population of Ecuadorian cities would increase from 3.6 million persons in 1980 to 5.7 million in 1990 and 8.5 million in 2000. The annual rate of growth would be about 4.2 percent per year.

The size of the primary school age population, the number of 6 to 11 year olds, would increase from 567,000 in 1980 to 870,000 in 1990 and 1,285,000 in 2000. The annual rate of growth would be 4.3 percent between 1980 and 1990 and 3.9 percent between 1990 and 2000. The number of entry level 6 year olds would increase from 101,000 in 1980 to 153,000 in 1990 and 225,000 in 2000.

In the rural areas, the population would grow from 4.7 million in 1980 to 5.7 million in 1990 and 6.8 million in 2000. The annual rate of growth over the 20 year period would be 1.8 percent, considerably lower than the urban rate of growth despite much higher fertility.

The size of the six to 11 year old age group would increase from 844,000 in 1980 to 1,050,000 in 1990 and 1,200,000 in 2000. This would be equal to a 42 percent increase over the 20 year period, much less than the 127 percent increase experienced in the cities over the same period of time. Annual rates of growth of the primary school age cohort would be 2.2 percent per year between 1980 and 1990 and 1.3 percent per annum between 1990 and 2000.

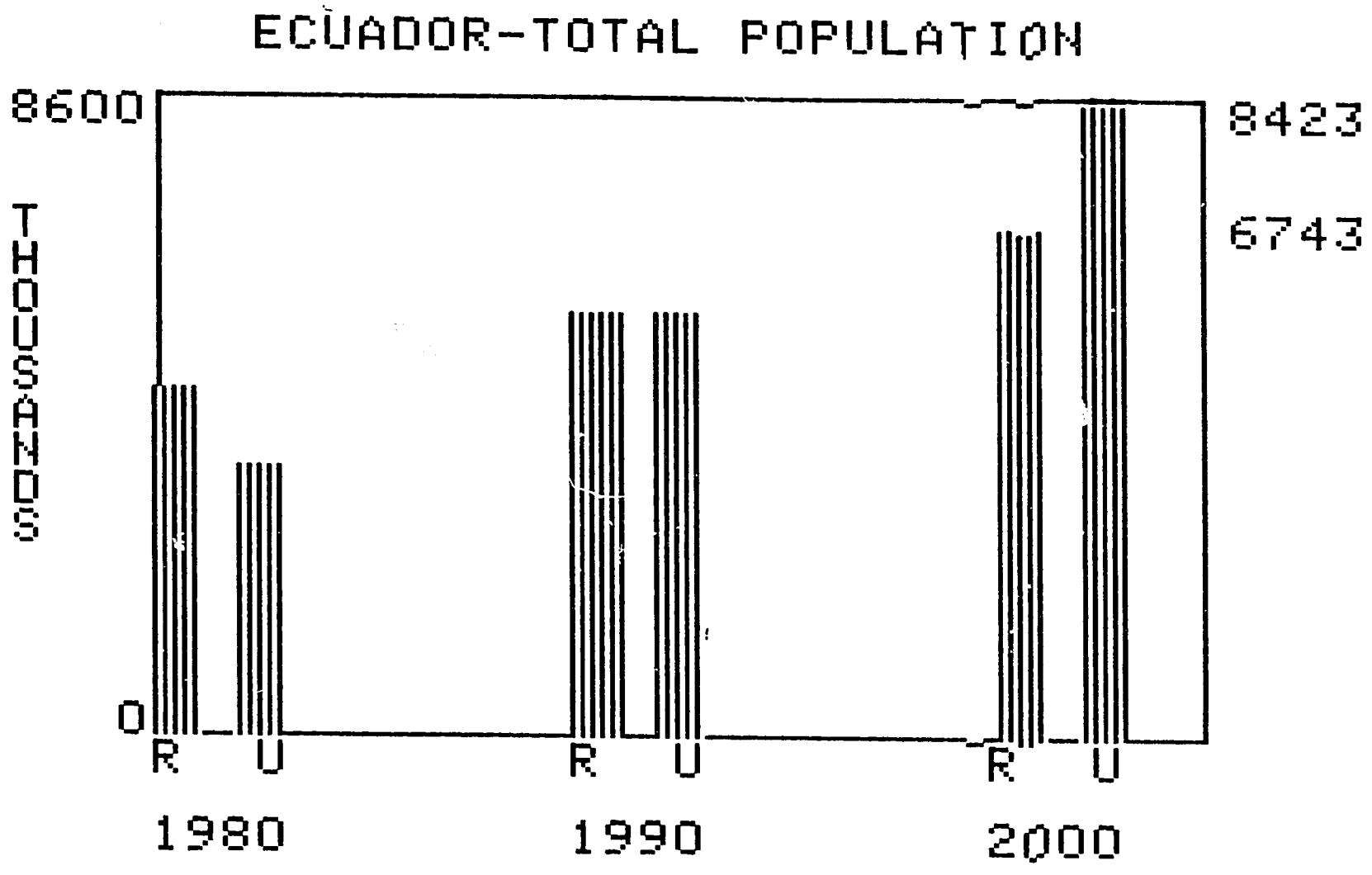
Because of migration, then, the school age population of Ecuador is actually growing much faster in the cities than in the rural areas, despite much higher fertility in the countryside.

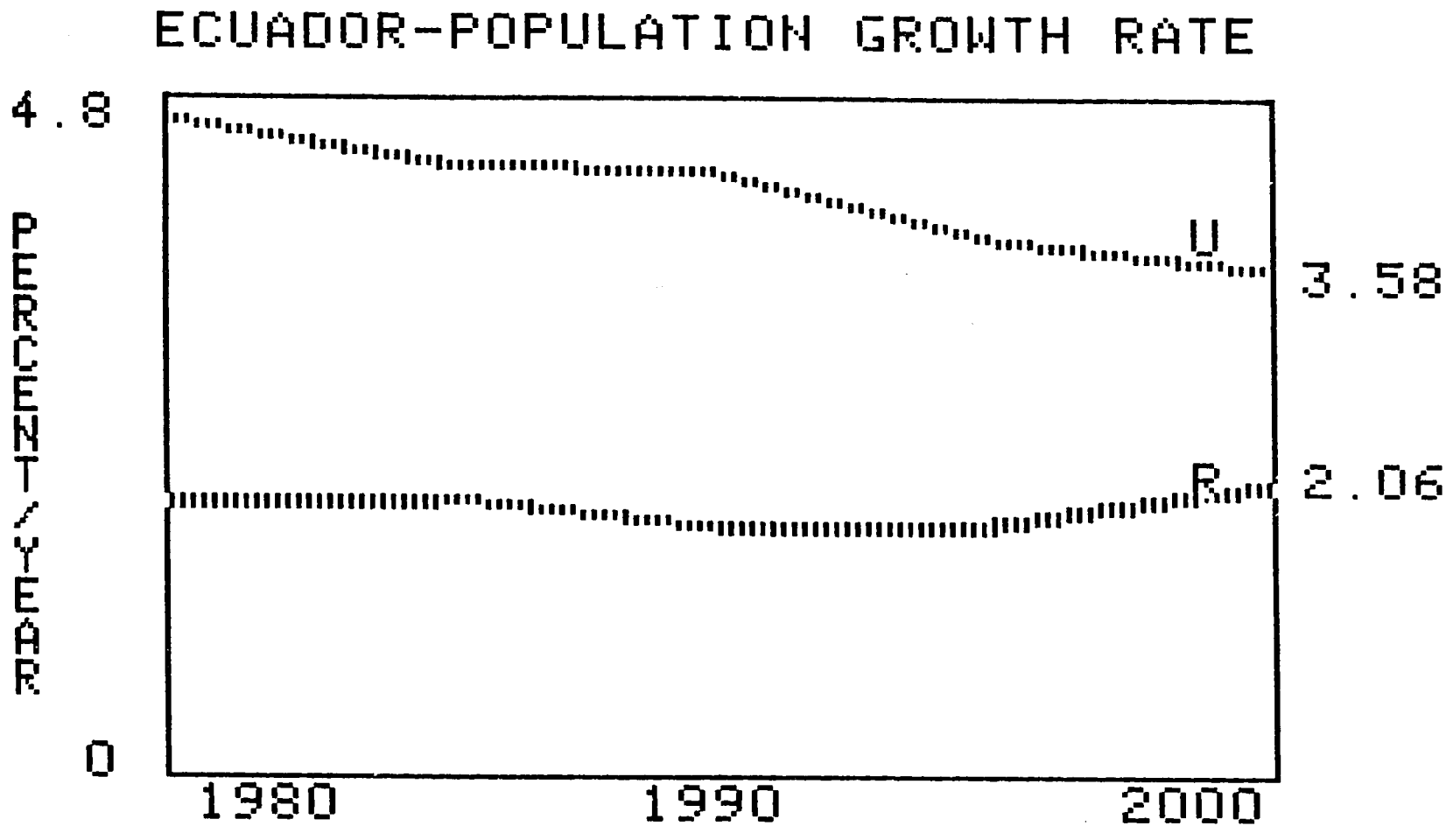
Concluding Remarks

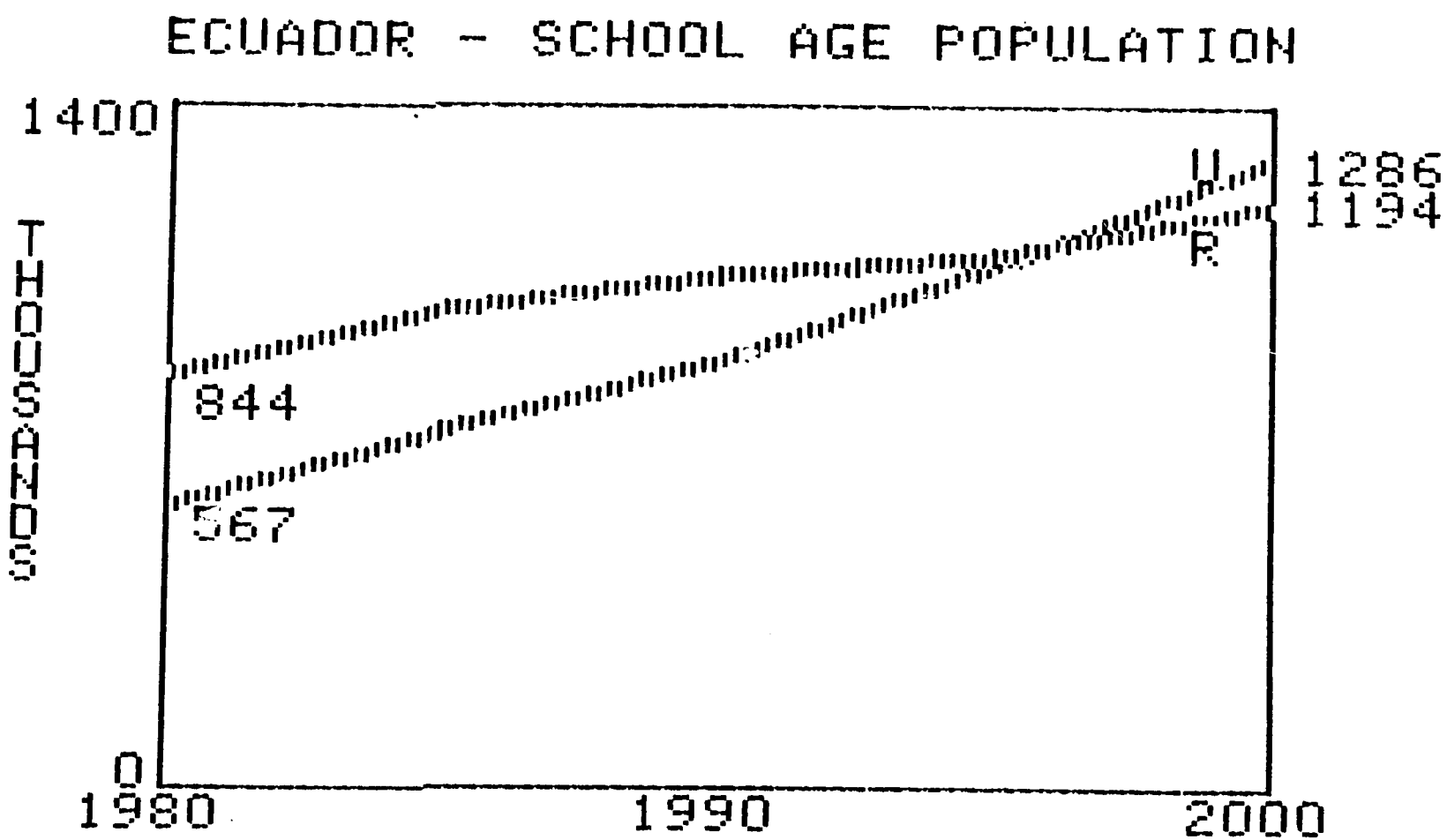
The rate of growth of the primary school age population can not only vary between urban and rural areas but among provinces, districts and geographic regions as well. Theoretically, differential rates of growth have to be taken into account in educational planning to prevent overbuilding in some areas and underbuilding in others.

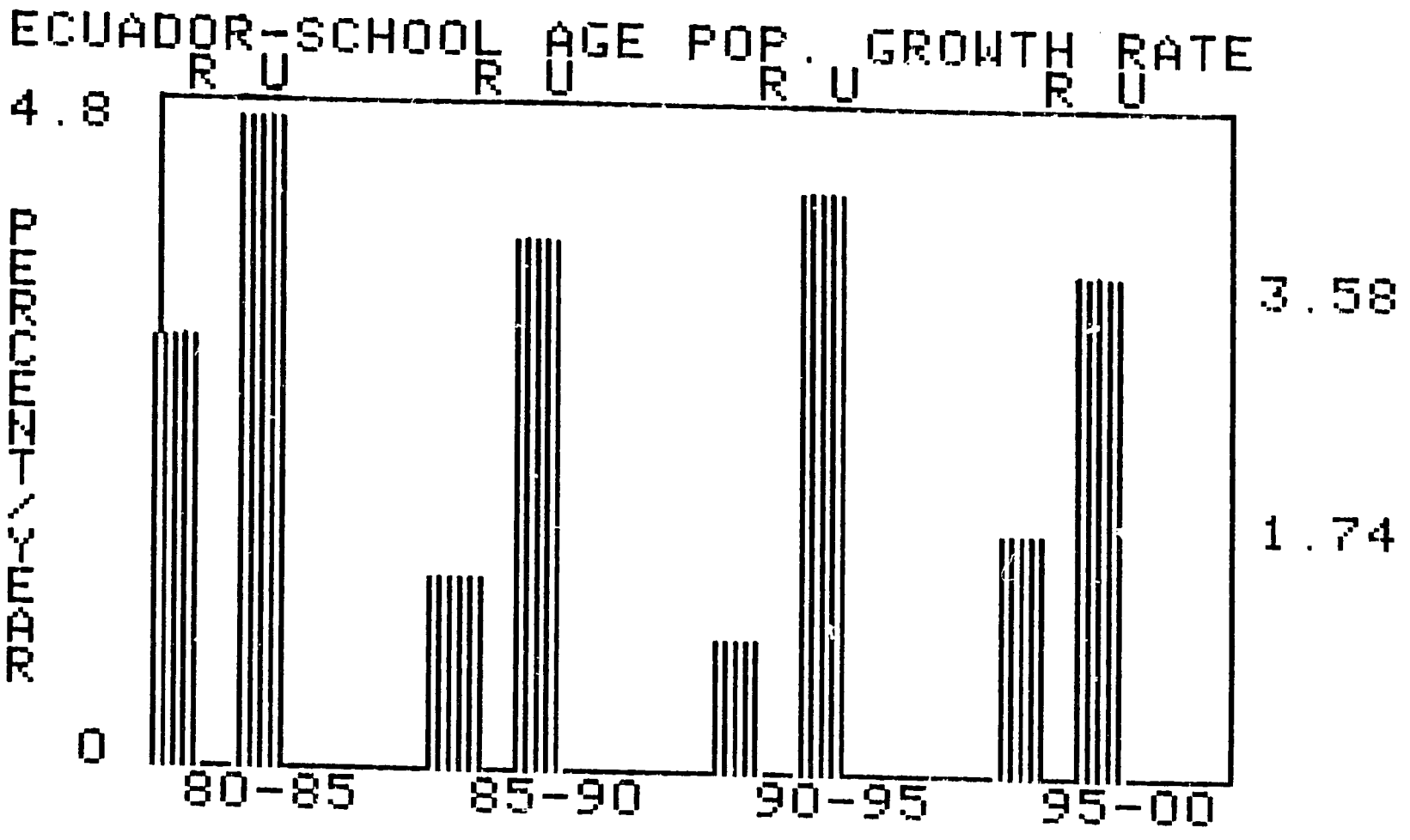
Practically, the problems are substantial. Usable fertility and mortality data are often not available for sub-national regions in many developing countries. Of the components of demographic change, fertility, mortality and migration, migration is the least predictable over time. Even in a country such as the United States, sub-national projections which have to take into account internal migration are regarded as the least reliable for planning purposes.

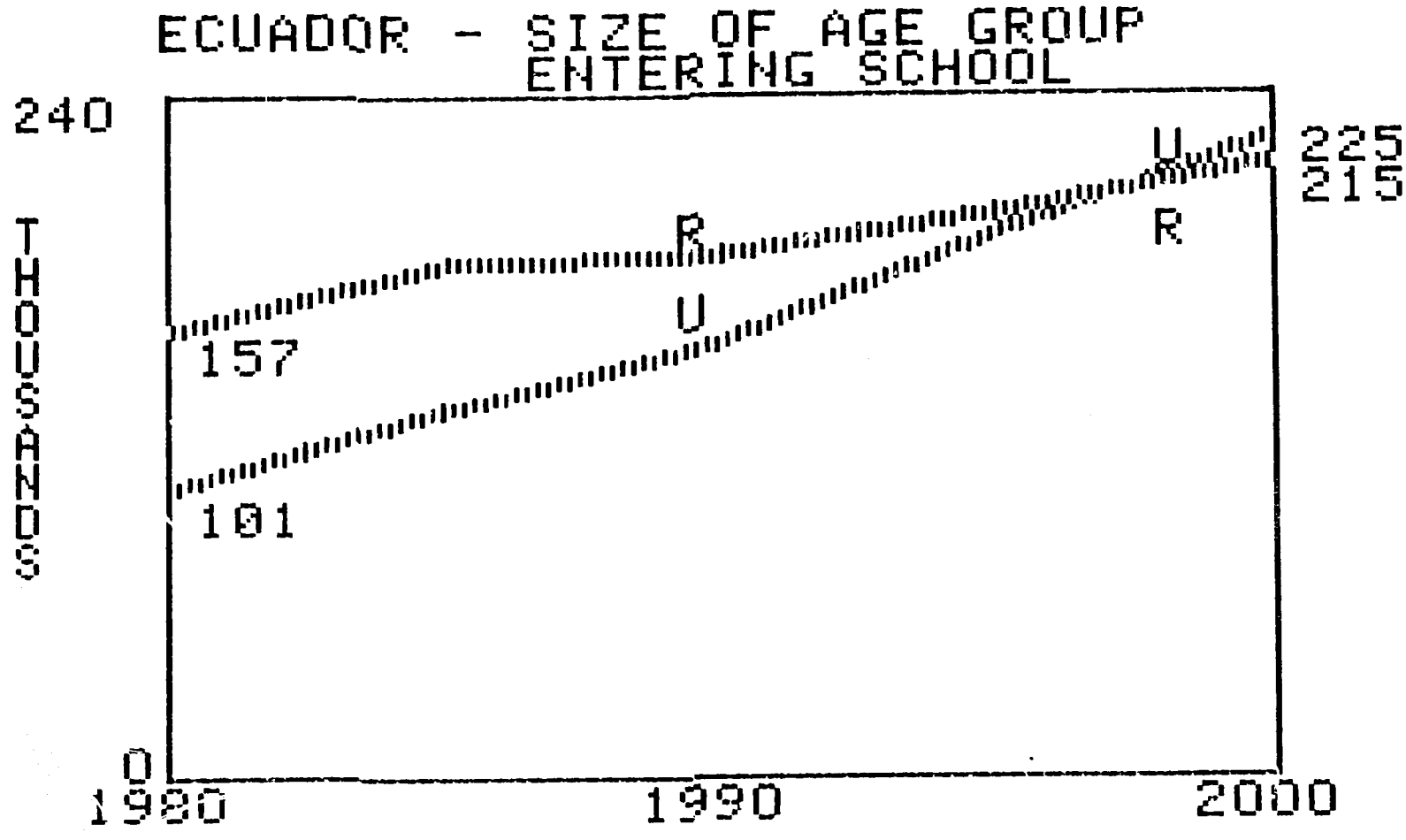
Nonetheless, in a country such as Ecuador where the differentials are so great that they would exist even given a considerable margin of error, regional differentials in the rate of growth of the primary school age population can be distinguished and incorporated in the planning process.


ECUADOR-TOTAL POPULATION
8600
THOUSANDS
0
8423
6743
R
U
R
U
R
U
1980
1990
2000


ECUADOR-POPULATION GROWTH RATE
4.8
PERCENT/YEAR
0
U
R
3.58
2.06
1980
1990
2000


ECUADOR - SCHOOL AGE POPULATION
1400
THOUSANDS
0
1980
1990
2000
U
R
1286
1194
844
567


ECUADOR-SCHOOL AGE POP. GROWTH RATE
R U R U R U R U
4.8
0
PERCENT-YEARLY
3.58
1.74
80-85
85-90
90-95
95-00


ECUADOR - SIZE OF AGE GROUP
ENTERING SCHOOL
240
THOUSANDS
0
1980
1990
2000
U
R
R
U
157
101
225
215

FOOTNOTES ON ECUADOR

1. Ecuadorian Ministry of Agriculture and United States Agency for International Development (EMA and USAID), Baseline Study of Agricultural Research, Education and Extension in Ecuador, (Quito: EMA and USAID, March 1979), p. 12.

2. Plan Nacional de Desarrollo 1980-1984, Politicas y Programas Sectoriales: Desarrollo Social (Segundo Volumen): Cultura y Educacion, Segunda Parte, Tomo IV (Ecuador: Marzo de 1980), p. 48.

3. World Bank, Ecuador: Development Issues, (Washington, D.C.: World Bank, December, 1981), p. 31.

4. World Bank, Ecuador: Development Problems and Prospects, (Washington, D.C.: World Bank, July, 1979), p. 2.

5. World Bank, Ecuador: Development Issues, p. 21.

6. EMA and USAID, Baseline Study of Agriculture, p. 12.

7. World Bank, Ecuador: Development Problems and Prospects, p. 2.

8. The low figure is from World Bank, Ecuacor: Development Issues, p. 22, the high figure is from World Bank, Ecuador: Development Problems and Prospects, p. 2.

9. EMA and USAID, Baseline Study of Agriculture, p. 12.

10. EMA and USAID, Baseline Study of Agriculture, p. 12.

Section VII. JAMAICA

The Primary School System

Education in Jamaica is free, universal and compulsory for 9 years for children ages 6-14.[1] The structure of the school system includes 6 years of primary school, three years of lower secondary school, and four years of upper secondary school. In addition there are a large number of "basic" or pre-primary schools which offer non-mandatory day care and instruction to some 60 percent of the children between four and six.[2] The medium of instruction is English and, at the primary level, there has been increased emphasis in the curriculum on manual arts and agriculture, as well as materials directly relevant to Jamaican history, art and literature.[3]

The present day structure represents a radical change from the system that existed previous to independence in the early 1960's. That system was based on the English educational model and while no formal barriers to education existed, there were significant de facto disparities in the quality of education offered to students of different races and geographic locations (particular urban-rural). Changes made since that time (e.g. income tax exemptions to families with full time students, nationalized pre-primary schools) have extended basic educational opportunities to all students on all parts of the island. Vestiges of the English system remain, particularly the emphasis on competitive examinations to determine advancement, but schools are now distinctly Jamaican.

Both private and public education is controlled by the Ministry of Education. In 1976 the total education budget was 187 million Jamaican dollars a figure that represented nearly 16 percent of the total government budget and 7.1 percent of the GNP for that year.[4] Approximately 83 percent of those funds were allocated to

current expenditures; money for capital projects was reduced in nominal terms from the previous year. Primary schools claimed approximately 30 percent of those funds, a far lower figure than the nearly 45 percent share they received in 1970.[5] This drop is due at least in part to a large shift of funds to the university level program between those two years.

The size of the primary school system has fluctuated between 1970 and 1979. The number of schools and the number of teachers have increased, the former by 20 percent (to 894) and the latter by 10 percent (to 8703) so that on average in 1979 there were nearly 10 teachers per school.[6] The number of students, however, decreased during this period by almost 13,000 to a total of 363,420.

One reason for the decline is the drop in gross enrollment rates for children ages 6-10. In 1970 the figure was 119 percent while in 1979 it was "only" 99 percent.[7] (Net enrollment in 1979 for that group was 92 percent.) One advantage to this change is a decrease in the student-teacher ratio. By 1979 the figure was 40 children per teacher down from a level of 47 in 1970.[8]

Despite the improvements made in extending educational opportunities, a number of problems still remain. Attendance in school is sporadic (estimated at a maximum of 65 percent) as long distances make transportation difficult and grade repetition is common.[9] Most troubling is a lack of qualified teachers particularly at the primary level. Many have received no formal training at all.[10] Only 75 percent of the adult population has completed the primary level and nearly 20 percent have had no schooling at all.[11] While these figures should decrease over time, the country has far to go before achieving functional literacy for its entire school age and adult populations.

Demographic Trends

The demographic experience of Jamaica has been closer in many ways to that of the developed nations rather than other developing countries. Life expectancy at birth which was already a relatively high 58 years in 1950 had risen to over 70 by 1980. Correspondingly, the fertility rate fell from about 5.4 children per woman in 1960 to 3.7 children per woman in 1980. Jamaica has also had significant numbers of people leave the island in the past, many of whom immigrated to the United States and Great Britain. For example, the United Nations estimated a net outmigration of 80,000 Jamaicans between 1975 and 1980.[12]

Demographic Projections

Jamaica is used in this study to look at the potential impact of outmigration on the size of the primary school age cohort. Two projections are used, both of which use the same fertility and mortality assumptions. More precisely, life expectancy at birth for males increases from 68.1 years during the 1980-1985 interval to an annual average of 70.7 years between 1995 and 2000 while life expectancy at birth for females rises from 72.6 to 76.1 years. The fertility rate drops from 3.7 births per woman to 2.1 births per woman (replacement level fertility) between 1980 and 2000.

1. No Migration Projection

What differs, then, is the international migration assumption. In the first projection, the assumption is made that no migration takes place between 1980 and

2000. In that event, the Jamaican population would grow from 2,188,000 in 1980 to 3,132,000 in 2000, a 43 percent increase over the twenty year period.

The size of the primary school age population would drop from 362,000 in 1980 to 328,000 in 1990, then rise back to 335,000 in 2000. The number of entry age 6 year olds would be 58,000 in 1980 and 56,000 in 2000.

2. Migration Projection

In the second projection, a migration assumption is incorporated which is taken directly from the United Nations Population Division 1980 projections. The U.N. uses an assumption of net outmigration from Jamaica of 56,250 persons between 1980 and 1985; 42,000 persons between 1985 and 1990; 30,000 persons between 1990 and 1995, and 22,000 persons between 1995 and 2000.

In this case, the national population of Jamaica would grow from 2,188,000 persons in 1980 to 2,913,000 persons in 2000 which equals a 36 percent increase. The population would be about 160,000 persons smaller in the year 2000 than with the no migration projection.

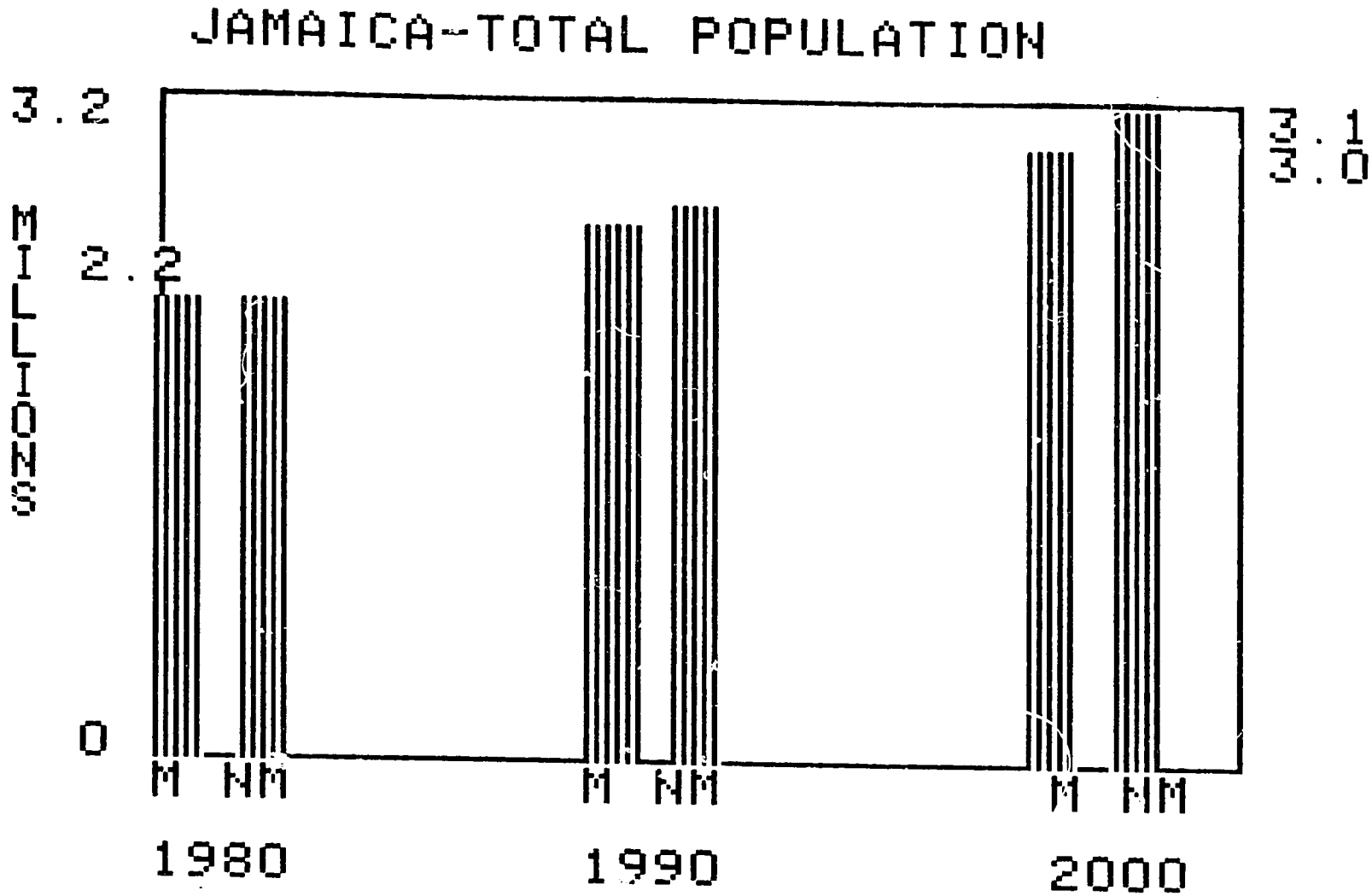
The school age population would drop from 362,000 in 1980 to 316,000 in 1990, and would then rise modestly to 317,000 children in the year 2000. The number of school age children would be about 6 percent less in the year 2000 than with the nomigration projection.

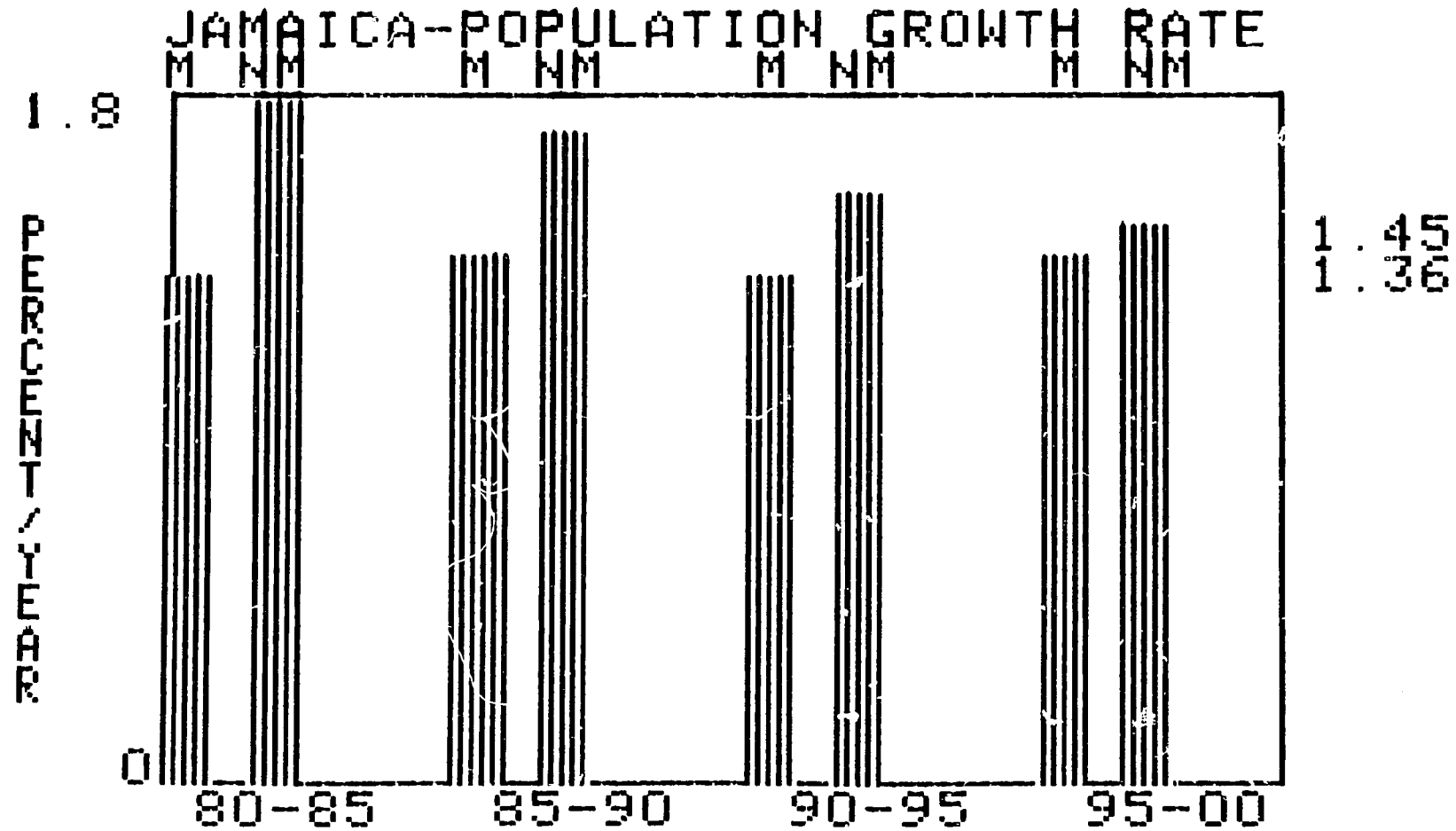
Concluding Remarks:

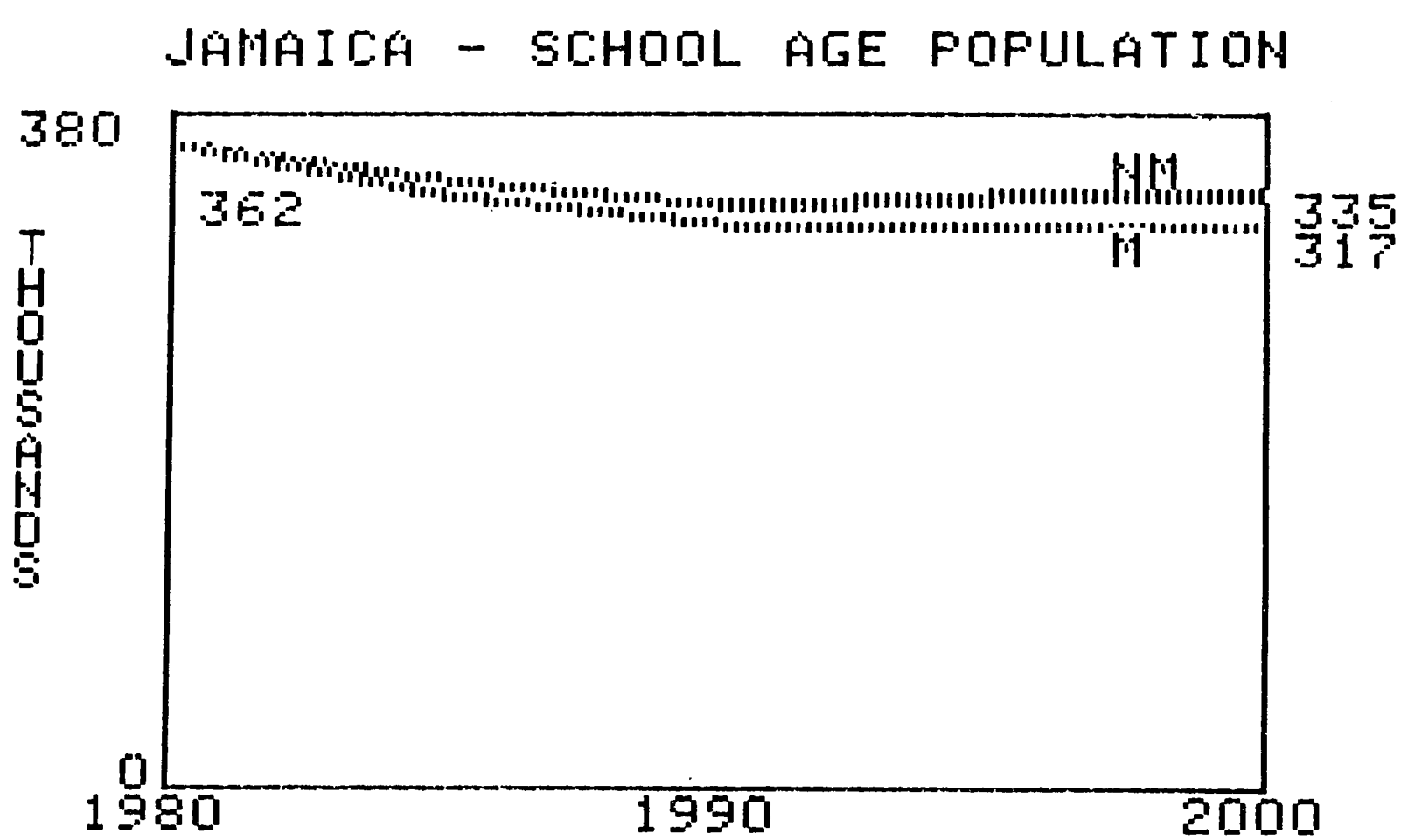
- Even in a country such as Jamaica which has a relatively high level of international migration and relatively low birth rates, the impact of emigration on the primary school age population is moderate.

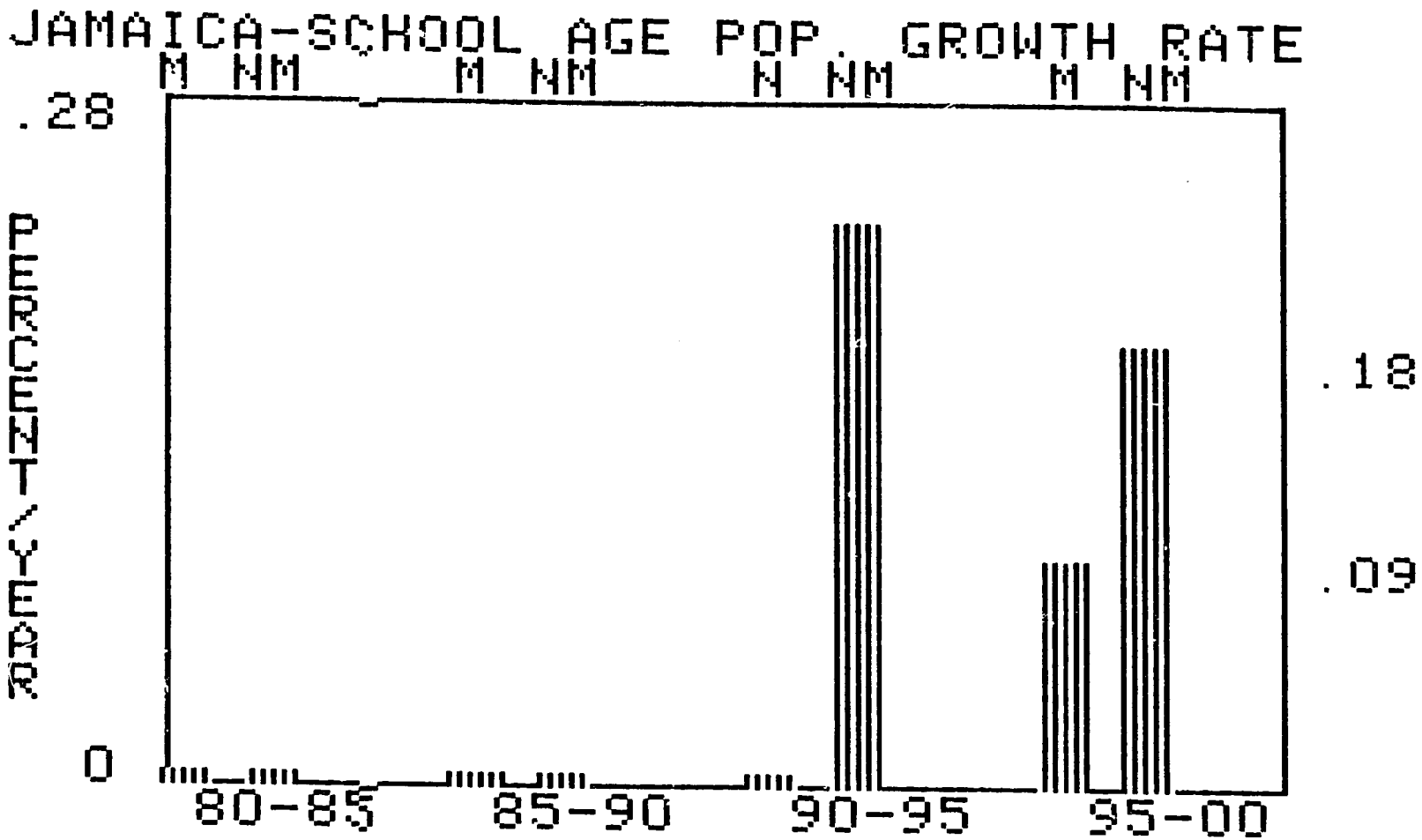
- Jamaica also serves as an example of a country with very low fertility. In this case, the size of the primary school age population is already as big as it is ever likely to be.

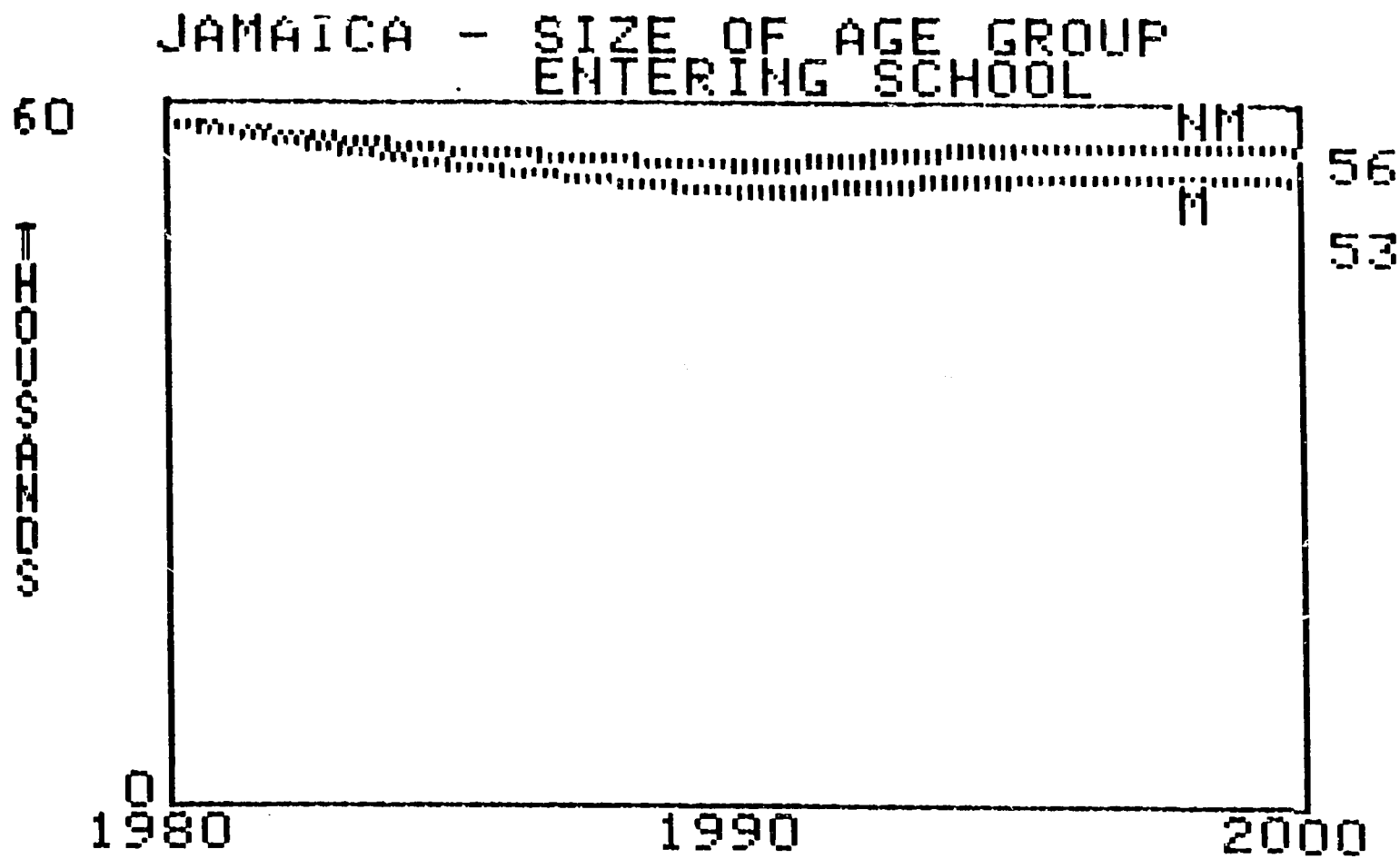
- Similarly, Jamaica again illustrates the notion that age subdivisions of the population are not necessarily growing at the same rate as the overall population. In Jamaica, the national population was growing by about 1.5 percent per year in 1980 at the same time that the primary school age population had already attained zero population growth.


JAMAICA-TOTAL POPULATION
MILLIONS
3.2
2.2
0
3.1
M
NM
M
NM
M
NM
1980
1990
2000


JAMAICA-POPULATION GROWTH RATE
M NM M NM M NM M NM
1.8
0
PERCENT/YEAR
1.45
1.36
80-85
85-90
90-95
95-00


JAMAICA - SCHOOL AGE POPULATION
380
THOUSANDS
0
1980
1990
2000
362
NM
M
335
317


JAMAICA-SCHOOL AGE POP. GROWTH RATE
M NM M NM N NM M NM
.28
PERCENT/YEAR
0
.18
.09
80-85
85-90
90-95
95-00


JAMAICA - SIZE OF AGE GROUP
ENTERING SCHOOL
60
0
THOUSANDS
NM
M
56
53
1980
1990
2000

FOOTNOTES JAMAICA

1. UNESCO, Statistical Abstract 1982. (Paris; United Nations Educational Scientific and Cultural Organization, 1982), table 3.1.

2. Foreign Area Studies of the American University (FAS), Area Handbook for Jamaica (Washington, D.C., U.S. Government Printing Office), p. 160.

3. FAS, p. 164.

4. UNESCO, table 4.1.

5. UNESCO, table 4.3.

6. UNESCO, table 3.4.

7. UNESCO, table 3.2

8. World Bank, Jamaica: Staff Appraisal Report, Third Education Project (Washington, D.C.; World Bank, 1981), Annex 1.

9. FAS, p. 162.

10. Kurian, George, Encyclopedia of the Third World, Revised Edition, (New York; Facts or File, Inc., 1982) p. 907.

11. Kurian, p. 907.

12. United Nations Population Division, Computer Printout for 1980 Projections.

Section VIII: OTHER DEVELOPING COUNTRIES

The above projections illustrate potential changes in the primary school age cohort under different demographic assumptions. The indicated range of change, however, is very broad. To what extent does a high fertility country like Kenya represent the developing world? Is a declining fertility country such as Sri Lanka a demographic aberration or can many other developing countries anticipate similar slow growth in the size of the primary school age population?

To answer these questions, all developing nations have been classified according to projected growth in the size of the primary school age cohort. The year 1980 is used as the base year and 2000 as the end point. Growth is measured by the percentage change in the size of the primary school age population over that 20 year period of time.

Very Fast growth is defined as an increase of more than 80 percent over the 20 years.

Fast growth is used to indicate an increase of between 50 and 80 percent.

Moderate growth is defined as an increase of between 20 and 50 percent.

Slow growth is an increase of 20 percent or less in the size of the primary school age population over the 20 year period.

The tables below are based on the United Nations medium variant, the one which is supposed to trace the most likely course of demographic events.

In Africa, the thesis holds that continued rapid growth of the school age cohort will pose immense challenges to the nations of the continent as they seek to achieve and maintain universal primary education. Only on the islands of Cape Verde, Mauritius and Reunion does growth of the primary school age population promise to be slow. Only in two North African states, Egypt and Tunisia, would

AFRICA: Percentage Change in The Size of the Primary School Age Population, 1980-2000, According to the United Nations Medium Variant

	Very Fast (80 percent and over)	Fast (50 to 80 percent)	Moderate (20 to 50 percent)	Slow (20 percent and lower)
East Africa	Burundi (89) Kenya (136) Madagascar (80) Malawi (102) Mozambique (86) Rwanda (106) Tanzania (96) Uganda (100) Zambia (104) Zimbabwe (105)	Comoros (74) Somalia (72)		Mauritius (7) Reunion (-4)
Middle Africa	Angola (84) Central African Republic (81) Congo (86) Equatorial Guinea (80)	Chad (65) Gabon (56) United Republic of Cameroon (72) Zaire (79)		
Northern Africa	Algeria (95) Libya (99) Sudan (83)	Morocco (68)	Egypt (41) Tunisia (21)	
Southern Africa	Botswana (99) Namibia (86) Swaziland (100)	Lesotho (72) South Africa (77)		

	Very Fast (80 percent and over)	Fast (50 to 80 percent)	Moderate (20 to 50 percent)	Slow (20 percent and lower)
Western Africa				
	Benin (100 Gambia (81) Ghana (96) Guinea (85) Ivory Coast (90) Liberia (108) Mali (92) Mauritania (96) Niger (102) Nigeria (99) Sierra Leone (80) Togo (91)	Guinea-Bissau (58) Senegal (77) Upper Volta (79)		Cape Verde Islands (7)

LATIN AMERICA: Percentage Change in the Size of the Primary School Age Population, 1980-2000, According to the United Nations Medium Variant

	Very Fast (80 percent and over)	Fast (50 to 80 percent)	Moderate (20 to 50 percent)	Slow (20 percent and lower)
Caribbean		Haiti (70)	Dominican Republic (23)	Barbados (12) Cuba (-16) Guadeloupe (-16) Jamaica (-12) Martinique (-21) Puerto Rico (14) Trinidad (-3) and Tobago Windward Islands (1)
Middle America	Nicaraugua (80)	El Salvador (70) Guatemala (60) Honduras (69)	Costa Rica (30) Mexico (38)	Panama (17)
Temperate South America				Argentina (14) Chile (19) Uruguay (13)
Tropical South America		Bolivia (79) Ecuador (77) Paraguay (57) Peru (70) Surinam (57) Venezuela (58)	Brazil (34) Colombia (28)	Guyana (3)

ASIA: Percentage Change in the Size of the Primary School Age Population, 1980-2000, According to the United Nations Medium Variant

	Very Fast (80 percent and over)	Fast (50 to 80 percent)	Moderate (20 to 50 percent)	Slow (20 percent and lower)
East Asia			Hong Kong (28) Korea (North (25) Mongolia (37)	China (-16) Japan (-21) Korea (South) (3)
Eastern South Asia		Democratic Kampuchea (57)	Burma (42) East Timor (40) Lao Democratic People's Republic (45) Malaysia (25) Philippines (31) Viet Nam (23)	Indonesia (7) Singapore (-2) Thailand (10)
Middle South Asia		Afghanistan (66) Bangladesh (56) Bhutan (54) Iran (57) Nepal (54)	Pakistan (36)	India (13) Sri Lanka (19)
Western South Asia	Jordan (95) Kuwait (110) Oman (88) Qatar (114) Saudi Arabia (102) Syrian Arab Republic (111) United Arab Emirates (116)	Democratic Yemen (70) Iraq (74) Yemen (64)	Bahrain (48) Israel (24) Lebanon (28) Turkey (41)	Cyprus (11)

growth be in the moderate 20 to 50 percent range. Everywhere else in Africa, growth of the primary school aged population will be rapid, and in most cases it will be very fast, with an increase of more than 80 percent between 1980 and 2000.

The pattern in Latin America is bimodal. On the Carribbean islands and in temperate South America, growth of the primary school age population will be either very modest or else negative. The exception is the impoverished nation of Haiti where growth of both the national population and the primary school aged cohort will continue to be rapid. In Middle America and tropical South America, the growth of the primary school aged group is likely to be fast in most countries. Growth, however, will be more moderate in the two demographic giants of the region. In Mexico,[1] the projections indicate a 38 percent increase in the size of the primary school aged population between 1980 and 2000, while in Brazil[2] the projected increase will be 34 percent over the same period of time.

Asia also exhibits considerable variation. In East Asia and Eastern South Asia, the projected increase in the size of the primary school age cohort will either be slow or moderately fast in most countries. Most importantly, the projected change in China is a minus 16 percent while the increase in Indonesia would only be 7 percent. On the other hand, growth in Middle South Asia and Western South Asia will continue to be fast or very fast. In particular, the Arab states of Western South Asia have projected increases in the size of the primary school age population equalling or surpassing those of the states of sub-Saharan Africa. The great exception in Middle South Asia is the demographic giant India where the primary school aged cohort would grow by only 13 percent between 1980 and 2000.

Again, these projections have been based on the United Nations medium series. If future trends turn out to be closer to the high variant, then even more countries will experience very rapid growth of the primary school age population. On the other hand, earlier United Nations projections erred in not anticipating the

rapidity of fertility decline. If future demographic trends in the developing countries prove to be closer to the low projections, then a greater number of countries will be in the moderate and slow classifications.

FOOTNOTES - OTHER DEVELOPING COUNTRIES

1. The medium projection of Mexico is based on the anticipated success of the national family planning program, a success which has not as yet fully materialized.

2. The variation within Brazil is great. For example, the growth of the primary school aged cohort will be fast in the Northeast but slow in Sao Paulo.

Section IX: CONCLUSION

The notion that rapid population growth presents a considerable impediment to the achievement and maintenance of universal primary education in the developing countries is a sound one for large portions of the developing world, including virtually all of Africa, and most countries of Middle America, tropical South America, Middle South Asia and Western South Asia.

At the same time, the range of demographic realities is much broader that the rapid growth case. In many parts of Latin America and Asia, projected growth in the size of the primary school aged population will either be relatively moderate, slow, or in several countries, non-existent. Most importantly, projected growth (using the United Nations medium variant) will be moderately fast in Brazil, Mexico, and Pakistan, slow in India and Indonesia, and negative in China.

Other key points may also be emphasized:

- The potential range of change within countries is great. For example, in Kenya there would be 8.9 million primary school aged children in 2000 with the high projection as against 6 million with the low projection. The fundamental question is: How can educational leaders in the early 1980s take into account future demographic trends when the range of alternatives is so great?

- Rapid mortality decline in some countries can have a moderate impact on the future size of the primary school cohort, but changes in fertility are much more important to the size of the school age population in the future.

- Similarly, even in countries with relatively high levels of outmigration, such migration is unlikely to have a major impact on the size of the future school age population.

- Internal migration, however, is a different story. As the Ecuador example shows, the school age population can be changing at radically different rates in different areas or regions of the country.

- A most common mistake made by planners using demographic information is to assume that the age subdivisions

of the population are growing at the same rate as the total population. In fact, when fertility and mortality patterns are in flux, the rate of change of the primary school aged cohort will usually be different than the rate of growth of the overall population.

Because fertility, mortality, and migration patterns affect the demand for educational services, and because education affects fertility behavior (a topic which will be treated in Part II), the discussion about the relationship between demographic change and education will continue to occupy an important place on the development agenda. An important part of the discussion will have to be how educational planners can best take demographic factors into account when planning strategies to meet basic educational needs.

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PART II. THE IMPACT OF EDUCATION ON FERTILTY

FINDINGS

- The conventional viewpoint that rising educational levels almost automatically lead to lower birth rates in the developing countries has been questioned in much of the recent scholarly literature on the subject.

- On the one hand, more education tends to lower the demand for children and educated women tend to be more knowledgeable about modern contraceptive techniques and are more likely to use such methods. On the other hand, education is in general positively associated with the potential supply of children because education results in better health practices and because women with some education tend to enter into more stable marital unions, ignore traditional taboos on sexual intercourse, and reduce the time children are breastfed.

- In poorer social and economic settings, a few years of primary education tends to increase the supply of children without lessening the demand, resulting in an actual increase in fertility. Rural Kenya is an example where fertility is higher among women with some education than among women with no education.

- The emerging consensus is not that the conventional viewpoint was wrong - indeed, rising levels of education, especially of women, do tend to be associated with declining fertility - but rather that the situation is more complex than more education leads to lower birth rates. In order for education to have a measurable and significant effect on fertility decline, the social and economic infrastructure must be developed to the point where learning has practical consequences, including increased opportunities for women in the modern sector of the economy.

Introduction

The objective of the second part of the study is to turn the question around and ask what role education can be said to play in determining fertility-related attitudes, preferences, and behavior in the developing world. To this end, historical studies of the fertility transition in the West will be discussed as will studies of the relation between socioeconomic development and fertility. Contemporary regional and cross regional studies of the bivariate relation between education and fertility will be reviewed and multivariate analysis incorporating a number of control variables will also be considered.

The subject of the relation between education and fertility is not a new one. The literature, which is sizable, stretches back several decades. A review of that literature indicates that education has long been assumed to play an important role in fertility decline. Undergirding this assumption are two other assumptions: that the decision to have a particular number of children, or any additional children, is the outcome of a rational decision-making process, and that education endows its recipients with a more rational approach to making decisions. In addition, education has been assumed to have a powerful influence on progressive social change.

All these conventional viewpoints have been reevaluated in recent scholarship. Despite the tenacity with which policy makers have clung to the "education as remedy" approach, the role of education in social change has been reconsidered. While Margaret Mead (1970) convincingly discusses the power of schooling to disrupt traditional culture by producing divisions in families and clans between those schooled and those not schooled, in particular between the older and the younger generations, others (see, for example, Altback, Arnove and Kelly, 1982; and for Latin America, Pama and Tedesco, 1980) provide strong evidence that

schooling is a mechanism for reinforcing economic hierarchies and the existing social order. The opportunity to attend school may represent and result in significant social change on the individual or household level, but schools as social institutions are geared toward preserving socio-political structures and economic relations in the larger society.

Proponents of the position that education plays a powerful role in fertility decline see schooling as central to the process. It has been referred to as an "omnibus - affecting choice of mate, preferences for children, earnings, household productivity, incidences of child mortality, and fertility control" (Schultz, 1973). In a recent review and critique of the literature, Graff (1979) maintains that such assertions are largely unsupported by the evidence, and are little more than a reflection of romantic Western views of schooling and literacy. He finds that ethnicity, place of residence, occupation, and age at marriage all, according to his data, have higher degrees of association with fertility than education. Other detractors such as Gimenez (1979) maintain that fertility-related attitudes and behavior are much like other class-based behaviors and attitudes; they are unlikely to be changed merely by an infusion of education.

A better understanding of the relationship between education and fertility will emerge from a clearer understanding of the components. Both education and fertility can be viewed in cultural and economic terms. In addition, they must be viewed not only independently, but as they relate to the backdrop of socio-economic and political conditions.

While both education and children have intrinsic worth, they can be related according to their market value. Education imparts knowledge, skills and certification. Schooling also imparts values, attitudes and modes of social behavior. School attendance precludes, generally, the ability to work for a wage. At the very least, rural families lose the labor of school children. Schooling can be costly in

other ways as well. Even if education is offered free to primary age children, transportation costs, clothing, books, materials, and frequently food costs are not provided by the state. These costs are borne because of an expectation of future returns on current investments. Viewed this way, education translates easily into both economic and cultural goods.

Childbearing is usually considered a social good. Traditionally, married couples are expected to produce offspring, and failure to do so results in a certain amount of censure. Childbearing and rearing is an expense. Like schooling, childbearing can be viewed as an investment in the future (i.e., children as a form of old age insurance), and as an investment with more or less early economic payoffs (i.e., children as workers).

An economic model which provides a convenient way of looking at fertility has been suggested by Easterlin (1974). It includes a consideration of supply factors, demand factors, and fertility regulation factors. The relationship between education and fertility has been viewed within the same framework. The variables through which education affects fertility are seen as having an effect on the biological supply of children, the demand for them, and knowledge of, attitudes toward, and practice of, family planning.

Of considerable importance is the notion that education does not affect fertility directly, but rather acts through intervening variables. For example, a woman may delay marriage to complete schooling thereby potentially reducing her fertility. Education, acting through age at marriage, would then have contributed to a decline in fertility.

Therefore, selection of relevant intervening variables is central to understanding the education-fertility relation. Bumpass and others (1981) suggest a good test of any explanation of that relation: If all relevant intermediate variables are controlled, education will be seen to have no discernible effect on fertility. To

date, no study has entirely accounted for the effect of education on fertility through delineation of all the relevant variables. However, Cochrane (1979) has developed a more or less comprehensive list which she has subsumed under the categories provided by Easterlin (1974).

Education and the Biological Supply of Children

Education has been related to the biological supply of children through the intermediate variables of health, infant mortality, marriage, the timing of sexual intercourse, and lactation. Although the literature confirms the assumption (see, for example, Cochrane, 1980) that an important relationship exists between health and education, the mechanism through which the association works is not altogether clear. One difficulty is in separating out income effects which could also be responsible for better nutrition and medical care. Educated women, who are often from high status backgrounds, are more likely to have their children in a hospital where survival rates are higher. Education, therefore, acting through better heaith practices, is positively associated with fertility and negatively associated with infant and child mortality. The former association suggests a positive effect of education on the biological supply of children; the latter association can be interpreted in various ways.

Because the research almost exclusively deals with ever-married women, the effect of education on fertility through the assumed inverse association between education and the proportion marrying cannot be determined by a review of the literature. On the other hand, it has been established that educated women marry later and this phenomenon has been associated with lower fertility in the younger age groups and lower cumulative fertility. Education is also related to the type of union in societies which sanction unions other than legal, monogamous marriage. Educated women are more likely to be in monogamous unions which are associated

with higher fertility than polygamous unions. In addition, educated women are more often in legal unions, while uneducated women are more often in common law unions. The latter are associated with lower fertility. The literature also confirms that a woman's education level is a good predictor of her choice of mate. Educated women are far more likely to marry educated men and unions of two educated persons have been shown to produce fewer offspring than any other combination.

Taboos on postpartum intercourse are associated with the most traditional, least educated segment of the population. Educated women tend to ignore traditional constraints on intercourse and so are more likely to be exposed to the risks of pregnancy.

Educated women are less likely to breastfeed their children. When they do, they persist in the practice for shorter periods than do their uneducated counterparts. Breast milk has been linked to higher child survival rates although some recent research disputes this relationship. Breastfeeding has also been associated with longer birth intervals since lactation tends to suppress ovulation.

In sum, while the effect of education on fertility through the intermediate variables associated with supply of children is not uniform, education is in general positively associated with the potential supply of children through improved health of parents and offspring, through some of the marriage variables, through the timing of sexual intercourse, and through reduced breastfeeding.

The Demand for Children

In general, the relation between education and fertility through the intermediate variables associated with demand for children is negative. However, because education and income are positively related, and since higher income is indicative of a greater ability to meet the costs incurred by childbearing and

rearing, the association between education and the demand for children through the intervening variables of perceived ability to pay may be positive. However, although educated parents have higher incomes, they also tend to expend more of their resources on childrearing. They also tend to spend a greater proportion of their resources in the modern consumer market. In comparison to uneducated parents, educated parents expect little economic return from their investments in children.

Contraceptive Practice

While knowledge of contraceptive devices is becoming increasingly widespread, educated women take the lead in their knowledge of modern devices and locations of birth control clinics. Educated women also report more favorable attitudes toward contraceptive use and more consistent use of modern contraceptive methods. In addition, husband-wife communication, which has been tied to a woman's tendency to use contraceptive devices, is reported to be better when women and couples are well educated.

The existence of, and easy access to, family planning services will influence the tendency of both educated and uneducated women to regulate their fertility. In areas and nations which have strong family planning programs, educational differentials in fertility are smaller than in places where there are no such programs. Program availability is just one contextual variable that will affect the education-fertility relation. There are many others.

Contextual Considerations

While it can be expected that education, as a socioeconomic variable, will have some independent effects on attitudes and expectations, the relationship

between education and fertility decline must be interpreted in a context of social and economic conditions.

One of the outcomes of schooling is role allocation through certification. The context in which education is delivered and attained determines the power of the certificate to confer status. Students may learn in state-supported public schools, private secular or religious academies, military academies, nonformal programs that combine the teaching of job skills, market strategies or agricultural practices with the development of functional literacy, a national literacy campaign where the primary objective is political socialization or other contexts. Where the school system is stratified along class lines, graduates from a specific stratum enter the corresponding stratum in the society. If education affects fertility primarily through the intermediate variables of employment and income, then schooling which confers a more powerful certificate will have the greater influence on fertility. The literature does not include many works on the differential effects of educational programs of varying status, but the data do indicate that, in many cases, schooling is more powerful than literacy (usually acquired in nonformal programs), and higher levels of schooling are more likely to be related to fertility declines than are lower levels of schooling.

The economic structure and the level of development of a country will also affect the impact which education has on fertility. While it is generally assumed that the more education an individual receives, the higher that individuals economic status will be, a 1974 study by Edwards and Todaro noted that the average level of education among the unemployed appears to be rising in developing countries. In another study of the "paradoxes of dependent industrialization," Irizarry (1980) determined that in Sri Lanka the unemployment rate of persons without schooling is significantly lower than the unemployment rate of those who have completed ten to twelve years of formal schooling. The level of

development of a country largely determines the availability of modern sector jobs, which tend to go to educated persons. Educated women in modern sector jobs have fewer children than do less educated women or women who work in the traditional sector.

The level of development of a country or region also influences the availability of health and nutrition services. If the level of economic development is so low that it limits access to services even for those who are educated, it is likely that differentials in fertility and infant and child mortality based on education will be less noticable than in areas with a well-developed health infrastructure. In less developed, less modernized sectors, however, where some education is tied to higher income, and income is the key to access to services, education is positively associated with fertility.

In some circumstances, where the level of economic development is relatively low, the general level of literacy and schooling is also quite low. In such a society, a schooled person is characterized by far more than his or her level of education and should be so represented in the structuring of any study of the relation between education and fertility. Where the development level is low, a schooled person represents a distinctly privileged individual, one who is very likely to have a high income and upper social class standing as well as exposure to westernizing influences. The point at which the effect of a particular kind of education begins and ends and these other factors come into play is very difficult to determine.

The national level of education and literacy is also an important contextual factor if the more significant intervening variables are those having to do with the real and perceived costs of childrearing. For example, in countries where only a small percentage of the female population is educated and employed outside the home, child care is relatively inexpensive. Readily available and inexpensive child

care make it possible for a woman to enjoy the rewards of both a large family and an occupation.

In addition, the level and distribution of education within a country determines the meaning and economic value of any particular level of schooling. The less educated a society is, the more valuable a small amount of education tends to be. Where, however, schooling is widespread, even higher levels of education are needed to secure the higher status and better paying jobs.

The level of development of a country and the general level of education of a population can be closely interwoven. Where there is high fertility and underdevelopment, the ability of the state to provide its school age population with education may be seriously impaired. (Although schooling has expanded tremendously in the developing nations of the world over the past two decades, the number of children not attending school is also greater than before.) Furthermore, mass education, as opposed to education of the elite, should have a greater bearing on both the economy and the culture of a nation as larger numbers of people are brought into the modern sector.

Much of what is true about the development level of a country is also true of the rural-urban dichotomy. The urban areas tend to be the more developed areas in a country. More modern sector jobs, easier access to health services, more schools, and more lifestyle options will influence the ability of education to affect fertility.

Culture (religion, ethnicity, traditional customs) is also an important contextual variable affecting the education-fertility relationship. In societies where women have low status they tend to receive minimal education, if any. Where they are educated, the education is specially designed to prepare them for traditional roles. Women educated in these circumstances are more likely to have high fertility than women who have no education at all. While it appears that educated women are very likely to abandon traditional ways (far more so than educated

men), in some communities cultural constraints (on women's employment for example) are more powerful than new attitudes and images gained from classroom experience. This is especially true where only a small percentage of the women are educated.

If it is important -- as this review of contextual factors suggests -- to view women in residence specific categories (taking into account urban-rural differences, ethnicity, and income groups), it is also important for a clear understanding of the education-fertility relation to place women in age-specific categories. The distribution of educated women differs among age groups and failure to control for age will result in miscalculations of the effect of education on fertility. Because schooling has been expanding, the value and meaning of education would be different between the older and younger age groups. This suggests, as well, that the effects of education on fertility should be investigated over time and not merely cross-sectionally.

It is unfortunate that so much of the literature concerns itself so little with the measurement and interpretive problems suggested by the foregoing paragraphs. As a consequence, the reader is often confronted by a wealth of contradictory and noncomparable data. However, the difficulty of accounting for all the factors and variables that may influence the relation between education and fertility should not be underestimated. Even the most carefully constructed studies appear unable to account for all of the observed education effects. Despite the introduction of a number of highly relevant intervening variables, direct education effects are still observable. It is unlikely, given the current state of social science research, that investigators will manage to take into account all the variables with which education has been associated and all the socio-cultural and economic factors that either enhance or impede the ability of education to affect fertility. Even if they could, it is doubtful that the relation could be predicted with certainty for any

particular popuation at any given time. At a very obvious level, time does not stand still and so contextual factors are always in flux.

Perhaps even more important is the assumption underlying the question that childbearing is subject to a process of rational decision-making, predicated on a set of economic imperatives. Even in areas like pregnancy, childbirth and child care, fashion plays a part and fashion is difficult to predict. A case in point is the recent interest in homebirths and midwives in the West; another is the return to breastfeeding among educated, and often employed, Western women. Also, while researchers have documented that schooling predisposes individuals to plan ahead, and counteracts the tendency to explain phenomena in magical terms (see, for example, Greenfield and Bruner, 1966), no one has established that a schooled society is any more amenable to explanation than an unschooled society.

Policy Implications

Despite all these real and expected problems with the data, the relationship between education and fertility decline in the developing countries is still worthy of consideration by policymakers earnestly seeking to reduce birth rates in the developing countries. To begin with, the majority of studies show that education is negatively associated with fertility. In those areas where the relation between the two is inverse, the effect of education increases over time until fertility is relatively low (Cochrane, 1982). The level of education of the husband also tends to be associated with reduced fertility (Cochrane and Handusan, 1981; Cochrane, 1982).

Investigations which show education positively associated with fertility suggest that this relationship occurs in the poorest, least developed, least modern settings (see, for example, Mason and Palan, 1980). An analysis by Cochrane (1982) indicates that (1) in all countries with a per capita income at or below $510 in 1978

there is a pattern of increased fertility with education prior to a decline at higher levels of education while in countries with an income of $740 or above, the relation between education and fertility is inverse at all levels; (2) the greater the degree of urbanization, the more likely it is that fertility will fall with each increment in education, and the larger these decreases will be; and (3) caloric intake is a significant determinant of whether education will be inversely or directly related to fertility.

The emerging consensus is not that the conventional viewpoint was wrong - indeed, rising levels of education, especially female education, do tend to be associated with declining fertility - but rather that the situation is more complex than more education leads to lower birth rates. In order for education to have a measurable and significant effect on fertility decline, the social and economic infrastructure must be developed to the point where learning can be applied to practical situations. A very necessary element in development programs would be a series of measures to enhance the status of women, in particular through the creation of broader opportunities for employment and higher education.

A longstanding question is whether policies which will contribute to declining fertility can be consciously adopted in the different functional sectors, such as education. The above discussion suggests that, in terms of education, each country must be treated as unique and the social and economic context evaluated to see what education measures might be adopted which could lead to lower birth rates. The options will be greater in countries with relatively advanced social and economic settings.

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