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FOREWORD

This is one of a series of World Bank pamphlets dealing with those sectors (e.g., education, agriculture, power, transportation, population, etc.) to which the Bank directs its development lending. Initially, these Sector Working Papers were not written with any thought of publication. They began as an internal exercise to gain better perspective on the characteristics of the fields of activity covered by the Bank's projects and to describe the size and philosophy of the Bank's lending program in each field.

The original instructions were to prepare papers that would describe the distinctive economic, financial, and institutional characteristics of each sector; outline the role played by each sector in the general process of economic development; review the scale and approach of World Bank operations in the sector; and summarize the Bank's philosophy about how its own operations, together with the activities of other aid donors, can contribute to building up each sector—physically, financially, and institutionally—in its member countries.

Although Bank loans are usually for specific projects (e.g., a dam, a group of schools, a power system) we are convinced that their merits can be judged only within a broad assessment of their relation to the development of the sector and of the whole economy. The fixing of priorities among individual projects, and the reform of policies and institutions to best serve a country's development needs, require that individual projects be considered in this wider context. Thus Bank projects are derived from an analysis of the larger economic systems into which they must fit. In conducting this "systems analysis" as a foundation for its project lending, the Bank places primary reliance on field-based country economic studies and sector surveys.

The Sector Working Papers have served a useful function at all levels within the Bank; we now feel they may be of similar interest to people beyond our own staff and management. They are therefore being published in a series of pamphlets that deal with the individual sectors in which the Bank is operating.

Robert S. McNamara
President, World Bank Group

March 1972

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POPULATION PLANNING

SECTOR WORKING PAPER

● This paper describes the Bank's efforts to help member countries reduce population growth rates and sets out its future program of activity in the field, as now envisaged.

To give perspective to this discussion, the paper also outlines the economic effects of reducing population growth in developing countries and summarizes available information on the global demographic situation, world population trends and projections, and the accomplishments and potential of family planning programs.

References to the Bank or the World Bank Group include the International Development Association (IDA) but not, for purposes of this paper, the International Finance Corporation (IFC). Money amounts are expressed in U.S. dollar equivalents. The Bank's fiscal year ends June 30.

INTRODUCTION

The purpose of economic development is to make possible higher living standards for individual men, women and children. A rising standard of living means a growing ability to afford both the material and non-material benefits which a modernized economy makes possible. For most people in most countries, however, the first requirements are more and better food, improved access to education and health care, and more opportunity for gainful employment.

Despite its limitations, one of the best available measures of economic progress toward these goals is the growth of per capita income. This is the growth of national income, adjusted for growth of population. Thus the relationship between the growth of a nation's income and that of its population is fundamental to the improvement of human welfare.

While neither the causes nor the effects in this relationship are fully understood, one central fact is clear: the higher the rate of population growth, the more difficult it is to raise per capita income. Today the world's population is growing much faster than at any time in history. This simple fact led the Pearson Commission to say, in 1969, that "No other phenomenon casts a darker shadow over the prospects for international development than the staggering growth of population."

The problems created by the large numbers and high growth rates of population concern both the world as a whole and individual countries. Both more and less developed countries confront such universal questions as the ultimate size of population the world can sustain and the rate at which the limit will be approached. The earth can undoubtedly support substantially more than the 3.6 billion people now living on it. But there is great doubt about its ability to sustain unlimited numbers at decent standards of living, which a majority do not have even now.

The World Bank's concern, however, is not with ultimate numbers, but with the developmental impact of population growth. Development does not mean more people, but higher living standards and greater welfare for however many there may be. The Bank entered the field chiefly because it became convinced that the attempt to raise living standards in a great many developing countries was being seriously undermined if not thwarted. The Bank has no fixed ideas as to how large the population of individual countries ought to be. But it is convinced that in the great majority of developing countries, the faster the rate of population growth, the slower will be the improvement of living standards. Within the last few years, the governments of more than 26 countries have indicated that they share this belief by adopting official policies to slow their population growth.

There is another important reason for the Bank's entry into the population field. It concerns human welfare, and particularly health. There is strong evidence that where children have been well spaced, both they and their mothers enjoy better health and experience lower mortality rates. It does not follow, of course, that parents will necessarily choose to space their children or to have fewer of them, if given the chance to do so.

Many governments feel, however, that people should be given the choice if it is possible to bring it to them, and the Bank is prepared to help them do so. Experience suggests that if couples are given this voluntary choice their own family-size decisions will tend to slow the rate of population growth. Yet no one can predict whether the general response will develop strongly or quickly enough to give governments substantial help in attaining their development objectives.

The Demographic Situation

It took more than 1,800 years for the world's population to increase from 210 million to one billion. The second billion required about a century and a quarter, and the third only 30 years. It is now taking only 15 years to add the fourth billion (see Table 1). If present growth rates

Table 1: World Population Trends, Zero A.D. to 1970
A. Population Size⁽¹⁾ (millions)

Area	About 0 A.D.	About 1000	1750	1800	1850	1900	1950	1960	1970
World	210	284	750	960	1,240	1,650	2,518	2,995	3,632
Europe		63	120	155	195	293	392	425	462
Soviet Union			30	45	70	130	180	214	243
Asia	138	165	480	630	810	930	1,381	1,660	2,056
U.S. and Canada			1	6	26	81	166	199	228
Africa			100	100	100	150	222	278	344
Latin America	33	56	12	20	35	65	163	213	283
Oceania			2	2	2	2	13	16	19

⁽¹⁾Totals may not check, due to rounding.

B. Average Annual Rates of Growth (%)

Area	1750-1800	1800-1850	1850-1900	1900-1960	1960-1970
World	0.5	0.5	0.6	1.0	1.9
Europe	0.5	0.5	0.8	0.6	0.9
U.S. and Canada	—	3.0 ⁽¹⁾	2.3 ⁽¹⁾	1.5	1.4
Soviet Union	0.6	0.9	1.2	0.8	1.4
Asia	0.5	0.5	0.3	1.0	2.5
Africa	0	0	0.8	1.0	2.4
Latin America	1.0	1.1	1.2	2.0	2.9
Oceania	0	0	0	1.6	2.0

⁽¹⁾Includes a high rate of adult immigration.

Sources: UN World Population Conference, Vol. II, pp. 21-22; and Population Council, Reports on Population Family Planning, December 1969.

were to continue, the current population of more than 3.6 billion would double in 35 years, and by the end of this century it would be increasing at the rate of a billion about every eight years.

It is becoming increasingly difficult to raise living standards and maintain even the present quality of life in the face of these huge annual increases in population. This is especially true in the developing countries, where two thirds of the world's population live and where five sixths of the 1970-80 increase will occur. Such increases impose heavy economic and social burdens.

In the mid-1960s, about two thirds of total annual investment in a sample of 22 developing countries was required to maintain per capita income at a constant level, leaving only about a third to raise living standards. The corresponding figures for a representative sample of 19 developed countries were one quarter and three quarters. It is clear that present rates of population growth in developing countries are penalizing the hundreds of millions who live on the margin of subsistence. If developing countries are to achieve sustained social and economic development, population growth must be reduced.

The high rates of population growth in most developing countries result from their traditional high birth rates and declining mortality rates. Improved health services and medical technology will cause further mortality declines, which will require fertility rates to be reduced from present levels simply to avoid further increases in population growth rates.

The evolution of populations through the three stages of (1) high fertility/high mortality, (2) high fertility/low mortality, and (3) low fertility/low mortality is what demographers refer to as the historical demographic transition. Both the first and last are periods of modest population growth; the middle stage is one of rapid growth. It is in this middle stage that the world as a whole now finds itself, because the total rate of growth is heavily influenced by what is happening in the less developed countries where two thirds of the world's population live.

The demographic transition describes what happened historically in the now-developed countries. The causes of fertility declines that carry countries into stage three are complex and not yet fully understood. They include such influences as increases in the age of marriage, urbanization, the gradual spread of education, reduced infant mortality, the high living standards that accompany rising incomes, the spread of old age pension systems, the prohibition of child labor, and rising equality for women.

There is no guarantee that the same set of forces affecting decisions on family size will emerge with equal force in today's developing countries and lead them inevitably into stage three. They have not done so to date. Eventually they may, although no one knows how long it might take. The provision of family planning services can do much to speed up, perhaps by many decades, a transition that otherwise might occur only very slowly. The difference in the pace of this change might make the difference between development and non-development.

It is important to note that the Bank's interest in "population" is wider than family planning, which is directed at the spacing of children and limiting fertility. The Bank's concern also embraces many other aspects of population and its effects on development. Its periodic analyses of the development prospects of member countries normally include the main demographic variables of births, deaths, and migration. Population issues are central to the Bank's long standing interests in education, employment, and rural development.

These other aspects of the population question lie outside the scope of this paper, which is concerned only with the problem of limiting fertility and with the Bank's contribution to that objective.

However, enabling and persuading man to limit his fertility is itself a much broader problem than the provision of family planning services.

WORLD POPULATION TRENDS

In the pre-industrial era, world population grew slowly. Disease, famine and breakdowns in the social order resulted in mortality rates which were normally high, and occasionally very high. Epidemics sometimes wiped out large proportions of a population in a few years. For example, in the two years 1348-50, bubonic plague (the Black Death) reduced the population of Europe by 25%. Under these conditions, fertility had to be consistently high to ensure the survival of families and of the population. Societies whose cultural, religious and legal codes did not place a high value on fertility would not have survived.

The Demographic Transition

Population growth rates in Europe began to increase during the late eighteenth century. This was the result of a decline in mortality which accompanied the agricultural and industrial revolutions, but which was not matched for many years by any corresponding decline in fertility. Before the decline, death rates were around 28 to 32 per thousand. By the mid-1800s, death rates in England and Scandinavia were about 10 points lower than they had been a century earlier. The decline spread over most of the continent, and the rate continued to fall until in Europe today it is about 10 per thousand. Thus in many European countries the transition to present death rates took more than 100 years; the transition occurred more quickly in countries where it started later.¹

Three factors are considered basic to the historical decline in mortality rates: improved nutrition as a result of higher agricultural and industrial productivity; better sanitation and personal hygiene, which reduced parasitic and infectious diseases, particularly water-borne diseases; and improvements in medical care. As a result of the differential trends in mortality and fertility, the long term growth rate of Europe's population doubled, from about .5% to 1%.

¹One of the more dramatic cases of a rapid fall in fertility occurred in Japan after World War II. Both birth and death rates rose between 1875 and 1920: thereafter the birth rate fluctuated at the intermediate levels of 26-36 per thousand, standing at 33 in 1949. The death rate, on the other hand, fell to about 12 in 1949, giving Japan a rate of natural increase of more than 2%. Between 1948 and 1952, abortion on medical or social grounds was legalized and contraception encouraged by the passage of new legislation. During the subsequent 20 years the birth rate fell 15 points to 18, and the death rate continued its drop to about seven per thousand in 1969, giving a rate of natural increase just over one percent.

In most European countries a decline in fertility did not begin until the second half of the nineteenth century. It has continued, with minor interruptions, until the present. In the mid-1700s European birth rates were high (35-40 per thousand in most countries), but not as high as in many of today's developing countries (often 40-50). The sharpest declines in fertility occurred between 1870 and 1930, when they leveled out at around 20, and most European countries today have rates between 15 and 20.

The motivation for reduced fertility appears to have arisen from the spread of education, the progress of urbanization, and a realization that reduced death rates would lead to larger families unless fertility were checked.

Population Trends in Developing Countries

Prior to World War II, the developing countries also were characterized by high birth and death rates, and thus had low rates of natural increase. The demographic transition began with a rapid post-war decline in death rates unaccompanied by a corresponding decline in birth rates. Growth rates began to increase. Today, the average is 2.8%, with the level in some countries as high as 3% and even 4%.

There are wide variations, of course, and different developing countries are at different points along the path of the demographic transition (see Table 2). In some, both fertility and mortality remain high.

Table 2: Population Distribution in Developing Countries by Fertility and Mortality Levels, 1970

Stages	Deaths per 1000 Population	Births per 1000 Population	Population					
			Africa ⁽¹⁾		Asia ⁽²⁾		Latin America	
			Number	Percent	Number	Percent	Number	Percent
1 (a)	High (over 25)	High (over 25)	27.0	8.0	17.0	1.4	—	—
(b)	Falling (15-25)	High (over 40)	307.0	90.1	978.5	82.6	24.0	8.4
2 (a)	Low (less than 15)	High (over 40)	5.0	1.5	76.0	6.5	112.5	39.9
(b)	Low (less than 15)	Falling	1.5	0.4	112.0	9.5	145.5	51.7
Totals			340.5	100.0	1,183.5	100.0	282.0	100.0

Note: Population figures are approximations. For purposes of this table, they have been rounded to the nearest 500 thousand.

⁽¹⁾Excluding five African countries with a total population of 42.4 million.

⁽²⁾Excluding People's Republic of China and four other countries with populations totaling 26.1 million, due to incomplete data.

Sources of basic data: United Nations, *Population and Vital Statistics Report*, January 1971; *Monthly Bulletin of Statistics*, August 1971; and Population Reference Bureau, *1970 World Population Data Sheet*.

In others, mostly in Asia and Africa, fertility is high and the death rate is falling. In still others, notably in countries with two fifths of Latin America's population, fertility is high and death rates are already low. In a few countries of temperate South America, East Asia and parts of Oceania, death rates are low and fertility is declining.

The postwar demographic experience has differed from the earlier experience of developed countries in several important respects:

- The decline in mortality has been much more rapid, occurring over one or two decades. For example, between the five-year periods 1945-50 and 1955-60, life expectancy at birth increased in India from 32 to 45 years, in the Republic of China from 41 to 61 years, and in tropical South America from 44 to about 52 years. Consequently, growth rates in the developing countries today are higher than were ever reached in Europe.

The difference is not merely in degree, but in kind. A European country with an annual rate of growth of 1% would double its population in 70 years; the average developing country with a growth rate of 2.5% will double its population in 28 years. If a 1% rate of growth were reduced to .5%, the doubling time would be extended by another 70 years to a total of 140. But an identical reduction of half of one percentage point when the growth rate is 2.5% would extend the doubling time by only seven years—a tenfold difference.

- Many of today's developing countries lack the open spaces and wealth of natural resources which characterized the areas of European settlement and enabled them to support high rates of population growth more easily.

- To some extent, the earlier growth in today's developed countries was attributable to adult immigration, leading to significant differences between their age structure during development and that of today's developing countries. By 1900, for example, only about 44% of the population of the United States and Canada was below the age of 20, while in developing countries today that age group commonly accounts for 50-55%.

- When mortality began to decline in many of today's developing countries, the levels of economic and social development were not comparable to those prevailing in Western Europe before the industrial revolution.

- The postwar decline in mortality has been occurring in many societies in which non-traditional economic practices and social attitudes, which normally accompany development, have not yet taken root. Unlike the reduction of fertility, a decline in mortality encounters no cultural and ideological opposition and does not require a large measure of continuous and active participation by the popu-

lation. In the earlier experience of today's developed countries, however, the technological means for similarly rapid reduction of mortality did not exist.

Thus, the current demographic situation in the developing countries does not have historical precedents from which they might take comfort. The considerably more rapid decline in mortality has created a greater imbalance than ever existed in the developed countries. This is the heart of "the population problem" in today's developing countries.

The solution depends on how fast and by how much fertility will decline in the next 20 to 30 years. The objective of population programs is to bring about declines in fertility more rapidly than would otherwise occur, primarily by supplying information and services to those willing to use them. To the extent that additional government policies and activities can influence voluntary fertility decisions, they too deserve to be considered as part of a country's population strategy. Much more needs to be learned, however, about both the effects and the efficacy of other instruments.

WORLD POPULATION PROJECTIONS

Table 3 suggests a range of possibilities over the next 30 years for the population of the world, the developing countries collectively, and a number of large developing countries individually. These are based on alternative projections showing what is likely to happen under optimistic assumptions (Projection A) and very slowly changing conditions (Projection B).

Projection A illustrates a type of population growth which could develop over the next 30 years if maximum efforts were made to develop family planning programs and take any other reasonable measures that might be effective in curbing fertility. On the basis of results achieved in the most successful programs to date, a "net reproduction rate" (NRR) of 1.0 could be expected by the year 2000.¹ This is a possible but unlikely achievement.

Projection B can be conceived of as an illustration of population growth trends if family planning efforts remain as modest as they are at present. Even under these slowly changing conditions, some decline in fertility can be expected because of family planning and some

¹The net reproduction rate is a measure of population replacement, in terms of the number of girl children born over the reproductive life of a hypothetical age group of women, after allowance for mortality. A population will not stop growing when the NRR of 1.0 is reached. It will maintain momentum for two or three generations, depending mainly on its age structure. Usually there is a relatively higher proportion of women in the child bearing ages than would be required for a stationary (non-growing) population. Therefore, even with a sustained NRR of 1.0 these populations would continue to grow for about 60 to 70 years until their age structure became stationary.

improvement in socio-economic conditions. In this case a NRR of 1.0 would be reached by about 2040.

These alternative projections, discussed in detail in Annex I, have the following major implications:

(a) **Population size and distribution.** World population, which totaled more than 3.6 billion in 1970, would reach 5.9 billion under projection A and 6.7 billion under projection B by the year 2000, a difference of about 770 million. Under projection A, world population would level off during the last quarter of the next century after having reached 8.4 billion. Under projection B, population would become stationary half a century later, at about 15.3 billion, or 7.4 billion more than under projection A.

The figures for developing countries alone are not very different. These countries would increase their population from 2.5 billion in 1970 to 4.5 billion in the year 2000 under projection A and to 5.3 billion under projection B. The difference is in the neighborhood of 800 million. The ultimate levels for today's developing countries would be about 6.7 billion people under projection A and twice as many, or 13.4 billion, under projection B.

(b) **The key role of large countries.** What happens to world population will depend very much on fertility trends in a few large developing countries. Comparing projections A and B for developing countries, half the difference in population size is accounted for by 12 of them: seven in Asia (India, Iran, Malaysia, Pakistan, the Philippines, Thailand and Turkey), two in Africa (Kenya and Egypt), and three in Latin America (Brazil, Colombia and Mexico).¹ This suggests the importance of giving priority to efforts to reduce fertility in countries where maximum impact can be achieved.

(c) **Fertility trends and births to be averted.** If projection A were achieved, the birth rate would be 7.1 per thousand lower in 1995-2000 than under projection B (21.1 instead of 28.2). For developing countries, the difference would be 9.3 per thousand (23.7 instead of 32). To achieve projection A rather than projection B, it would be necessary to avert about 840 million more births between 1970 and the year 2000 in the developing countries than projection B assumes; almost half of these would have to be in the 12 countries listed above.

While present programs give little promise of achieving a NRR of 1.0 by the year 2000, a substantially increased effort now should bring this goal within reach by about 2025. To reach a NRR of 1.0 by the year 2000 would require a maximum effort, something it is probably not realistic to expect.

¹Two large countries, Indonesia and Nigeria, are omitted from this list due to lack of sufficient data.

Table 3: Alternative Population Projections,⁽¹⁾ Birth Rates, and Births Omitted

Regions and Countries	Projection	Population (in millions)			Birth Rate (Per 1,000 Population)			Additional Births Omitted 1970-2000 (in millions)
		1970	2000	c. 2075 A c. 2125 B	1965-70	1995-2000	2020-25	
World Total	A	3,652	5,916	8,348	34.0	21.1	16.3	882
	B	3,652	6,690	15,306	34.0	28.2	23.1	
Developed	A	1,122	1,388	1,622	18.8	15.8	14.0	45
	B	1,122	1,431	1,931	18.8	17.4	15.6	
Developing	A	2,530	4,528	6,727	41.8	23.7	17.2	837
	B	2,530	5,259	13,374	41.8	33.0	24.6	
Asia								
India	A	536	948	1,402	41.4	23.6	17.1	174
	B	536	1,100	2,799	41.4	32.9	24.6	
Iran	A	28	56	88	45.0	24.3	17.2	13
	B	28	68	213	45.0	36.5	26.8	
Malaysia ⁽²⁾	A	9	18	27	36.0	21.2	16.1	4
	B	9	21	54	36.0	30.1	22.8	
Pakistan	A	126	260	408	42.3	24.2	17.0	62
	B	126	316	982	42.3	36.4	26.6	
Philippines	A	38	79	122	45.2	24.1	17.3	18
	B	38	95	282	45.2	35.9	26.2	
Thailand	A	37	72	108	41.1	22.4	16.7	15
	B	37	86	234	41.1	33.1	24.7	
Turkey	A	34	62	91	36.0	22.0	16.5	10
	B	34	71	173	36.0	30.6	23.2	
Africa								
Egypt	A	33	62	94	44.5	24.0	17.1	13
	B	33	74	205	44.5	34.8	25.6	
Ghana	A	9	17	25	49.2	25.6	18.0	4
	B	9	20	58	49.2	37.7	27.4	
Kenya	A	11	21	31	49.6	25.1	17.6	5
	B	11	25	70	49.6	36.7	26.5	
Tunisia	A	5	10	15	45.3	24.0	17.4	2
	B	5	12	34	45.3	35.8	26.1	
Latin America								
Brazil	A	94	181	273	38.6	22.1	16.5	31
	B	94	209	529	38.6	31.1	23.5	
Colombia	A	21	41	62	38.0	22.1	16.6	8
	B	21	48	120	38.0	31.3	23.6	
Mexico	A	51	109	172	44.6	23.7	17.0	27
	B	51	131	397	44.6	35.7	26.1	

⁽¹⁾For Projection A, a linear decline in gross reproduction rate (GRR) is assumed to a level which corresponds to a net reproduction rate (NRR) = 1 by the years 2000-2005; this decline is equated with maximum effective fertility control. Projection B represents population trends under the assumption that the GRR will decline linearly to make NRR = 1 in the year 2045; this situation is considered likely to occur if efforts for fertility control continue at the present levels. Both projections assume the same mortality which is supposed to have different declines in the future, for different countries. The full explanation of the assumptions is found in Frejka's introduction to his projections.

⁽²⁾Excluding Sabah and Sarawak.

Source: The table is computed on the basis of data from Tomas Frejka (Population Council), in "Alternatives of World Population Growth," a monograph in process of publication.

ECONOMIC EFFECTS

Relative Growth Rates of Population and Income

Rapid population growth is a comparatively recent phenomenon. It has accompanied economic development, and it is clear that the possibility for more people to live longer and fuller lives has been one of development's more important results. Past history, however, is a misleading guide to action, because the present situation does not offer a comparable possibility. As noted above, new forces are producing unprecedentedly high rates of population growth, while special circumstances which gave peculiar impetus to economic growth in the earlier period do not prevail.

There is no reason to believe that current rates of growth will fall fast enough to relieve the pressures on developing countries arising from the need to use significant and rising proportions of their resources simply to maintain the average standard of living of growing numbers, leaving less for further improvement. It is not that countries cannot have both growing per capita incomes and growing populations; the growth record of many developing countries in the last two decades shows that this is not impossible. What is at issue is the maintenance of per capita income growth at acceptable levels over longer periods, when the population may be doubling every two to three decades.

The decline of mortality in most developing countries has resulted in the survival of more adults, who would otherwise have had a shorter life span, and an increase in the number of surviving infants. The respective contributions of these two groups to the postwar population increase cannot be accurately calculated, but probably they are about equally significant.

The economic impact of their survival is quite different, however; more adults living longer increase the potential labor force and create an immediate demand for jobs and supporting services. They also add to the numbers in the reproductive age group, with a potential impact upon fertility. More children surviving mean a rise in the dependency burden and, at a later stage, a further relative increase in the reproductive age groups. Thus while any fall in the infant mortality rate is to be welcomed on humanitarian grounds, it adds burdens to weak economies which can be lessened only by reducing fertility. To do so, and thus lessen the dependency burden, leads to large economic benefits. This is the heart of the economic case in favor of programs to limit fertility.

The other component in high population growth rates has been the continued high level of fertility. In the longer run this can be

expected to decline everywhere. However, cultural and social factors are significant enough to make for important differences in fertility levels among areas of the world. In the face of continuing success in reducing mortality, no developing country has yet experienced a fertility decline sufficient to reduce the rate of population growth to the average level of 1% per annum characteristic of the developed economies of Europe, North America and Japan.

Falling fertility is the only factor that can accomplish such a reduction—except, of course, a return to much higher mortality rates. The issue is not whether the reduction will take place, but how soon, by what means and at what cost. The question is whether it can be initiated and accelerated through appropriate policy actions, in order to reap more quickly the economic benefits that can be linked with lower rates of growth.

Effect on Per Capita Incomes

The most certain, immediate, and measurable benefit of slowing population growth is the increase in per capita income. The immediate impact of falling fertility is a decline in average family size, reflected throughout society in a smaller dependency ratio.¹ In the short run there is no change in the labor force or other resources, so that the same national income will be available to a smaller number of people. At the same time, proportionately less of the national income will have to be used to maintain the capital stock per person at a constant level, making it possible to apply more resources to increasing capital per worker, thus raising productivity and per capita income.

The higher per capita incomes permit higher savings which could finance higher levels of capital accumulation, both physical and human. This, in turn, leads to further increases in the national income. There is nothing automatic about such a process, however; it is made possible by falling fertility, but the possibilities have to be seized and used for purposes which promote economic development. Such development may be accelerated as much by the investment in human resources—notably improvements in the quality of education—as by other kinds of capital improvements.

The effects of the decline in fertility will be felt in the labor market, which will have fewer entrants approximately 15 to 20 years later. The impact of this decline upon the national income will depend

¹The ratio of people not in the labor force to the total population. Since all persons depend on the production of those in the labor force, a lower ratio means that producers do not have to share their output with as many non-producers, yielding both producers and their dependents a higher per capita income.

mainly upon whether the opportunities made possible by lower population growth in the previous 15 years or so have been used to increase the quantity and quality of the capital stock. Many factors are involved, including labor productivity, the composition of the labor force, and improvements in health and education made possible by rising per capita incomes.

Employment and Income Distribution

Problems of unemployment and inequality in the distribution of income will always be eased by reductions in fertility. Continuing high fertility results in large numbers of young people entering the labor force each year. Employment opportunities have to expand fast enough to absorb them. At high rates of growth of population, where the numbers involved may be doubling every 25 years, the absorption problem is severe.

Any country with a problem of long run unemployment cannot fail to benefit from the slower growth in the labor force which results from reduced fertility. Where large numbers of people are entering the labor force to compete for jobs, wages are depressed, while those who own or control capital earn high returns, as do the owners of land and other resources in fixed supply. In any social or political system, high fertility tends to worsen the distribution of income and wealth. A reduction in the rate of growth of population makes it easier to redress these inequities.

Estimating the Effects

The longer term cumulative economic effects of lowering population growth rates are clearly profound, although it is difficult to isolate them from those of other economic forces. Since there is no basis for estimating such effects historically, attempts have been made to indicate their orders of magnitude by the construction of simulation models. With these models it is possible to work out the implications of varying fertility reductions over several decades, and to compare the results with the situation assuming no fertility decline.

While the quantitative results depend upon assumptions made about the economic relationships involved, they indicate substantial benefits in growth of per capita incomes, with a cumulative effect over time. Typically, if fertility is halved in a generation, by the end of that period per capita incomes can be 20% to 40% higher than if fertility had remained constant. The indicated benefits become more impressive as projections are extended into the future, but results in

the shorter period are more persuasive in terms of current policy.

This account of the economic benefits to be expected from a reduction in population growth rates places its main emphasis on the attainment of a higher per capita national income. The national income, however, has long been recognized as an incomplete measure of welfare, even in strictly economic terms. It needs to be supplemented by taking account of other benefits of reduced fertility.

Some of these appear as social benefits, but they have economic consequences which may themselves be measurable, at least in principle. They include an increase in the spacing between pregnancies, bringing benefits to the family in the form of improved health for mothers and children, fewer maternal deaths, and fewer retarded and handicapped infants. Improved nutrition and family care is more likely with smaller family size. A reduction in the number of illegal and unsafe abortions also follows as knowledge of contraception spreads.

It is possible to place many of the above conclusions in a cost-benefit framework, relating the value of the benefits to the costs of programs required to bring about reductions in fertility. There is as yet no fully agreed basis for estimating some of the key values to be employed, and even the use of this approach has aroused controversy. But there can be no question that the economic benefits of lower rates of population growth are considerable, and would prove to be all the greater if proper account could be taken of those which are not easily quantified. Calculations have consistently shown a level of benefits that exceed costs by a very wide margin.

Other Implications of Population Size

Much of the concern about current population growth stems from anxiety about its implication for the future size of population, whether in the world or in a particular country, in relation to the availability of natural resources. The growth of population, however, accounts for only about half the growing annual drain on the world's resources. The other half, or more, arises from the growth of per capita incomes.

Thus, except perhaps in the case of food, it is both rising levels of income and expanding populations that create pressures on the use of natural resources. These seem bound to intensify even if population growth slows down, despite man's ingenuity in overcoming technological problems with new agricultural methods, new sources of energy, new ways of combating pollution, and new, increasingly dense modes of urban living.

Even if many of the difficulties concerning the environment and

resource availability stem as much or more from income growth as from population growth, the wealthier a country is in per capita terms, the easier it will be to mobilize resources in order to cope with such problems. For example, an economy of 20 million people with an average income of \$2,000 might have the same problems of pollution or scarcity of resources as one of 400 million with a per capita income of \$100. There is little doubt that the smaller country could more easily tackle such problems, because of its greater taxing power and the more developed research and production capabilities that are associated with higher incomes.

Against the disadvantages of larger population size one potential advantage is sometimes mentioned: countries with large populations may be able to take advantage more readily of the economies of scale that undoubtedly exist in many activities, particularly in manufacturing. Market size, however, is more a question of aggregate income than of population size per se. There may historically have been countries which could have been considered under-populated, in terms of the economy's ability to make effective use of its natural resources. Perhaps the United States was in this position at some point in the past. However, instances when the addition of more people to the labor force led to increases in labor productivity and income per head must have been few in the past and are virtually nonexistent today. Developing economies will be able to increase per capita incomes more rapidly if their population growth is low than if it is high.

FAMILY PLANNING EFFORTS

While efforts to reduce population growth rates are still dwarfed by the magnitude of the problem, there has been a notable—even dramatic—increase over the last decade in both public and governmental interest, concern and action. In 1960, only three countries had official policies designed to slow the rate of population growth; by 1971, 26 countries, with more than two thirds of the population of developing areas, had announced such policies or started official programs; and some 24 others, with 12% of the developing world's population, supported private family planning programs without announcing official policies (see Table 4).

By 1970, 30 heads of governments, including those of 19 developing countries, had signed the U.N. Declaration on Population, which characterized "unplanned population growth" as one of the world's "great problems" and called on national governments to recognize family planning as one of their "vital interests."

Table 4: Official Positions of 48 Developing Countries on Family Planning

Population Size (Millions)	Policy and/or Program	Support but No Announced Policy
400 and more	People's Republic of China (1962) India (1952, reorganized in 1965)	
100-399	Indonesia (1968) Pakistan (1960, reorganized in 1965)	
25-99	Egypt (1965) Iran (1967) Republic of Korea (1961) Nigeria (1969) Philippines (1970) Thailand (1970) Turkey (1965)	
15-24	Morocco (1965)	Colombia South Africa
10-14	Republic of China (1968) Kenya (1966) Malaysia (1966) Nepal (1966)	Ceylon Tanzania Venezuela
Less than 10	Barbados (1967) Botswana (1971) Dominican Republic (1968) Ghana (1969) Jamaica (1966) Mauritius (1965) Puerto Rico (1970) Singapore (1965) Trinidad and Tobago (1967) Tunisia (1964)	Bolivia Chile Costa Rica Cuba Dahomey Ecuador El Salvador The Gambia Guatemala Haiti Honduras Hong Kong Nicaragua Panama Rhodesia Senegal Western Samoa

Source: Lapham, R. J. and Mauldin, W. P., "An Assessment of National Family Planning Programmes," unpublished paper presented to OECD's Fourth Annual Population Conference, October 1971.

Program Results

About 20 million women in 18 countries with programs, or 10% of the married women of reproductive age in those countries, have become "acceptors" during the last five years, the average period the programs have been in effect (see Table 5). It is important to distinguish between the total number of "acceptors" and the annual increase in that number (and to distinguish between the gross and the net increase, i.e., after allowing for those who cease their participation). The figure of 20 million acceptors overstates the number of women practicing contraception, because in every country many

acceptors leave the program and those who reenter are again recorded as "new acceptors."

Countries with population programs usually establish population goals, or targets. They may aim at reducing the existing crude birth rate to a specified lower rate over five to 10 years, or at recruiting specific numbers of acceptors into the program (sometimes even classified by methods) over a certain number of years.¹

An examination of these targets will show that a number of the programs which began five or more years ago, after declines in fertility for a few years, appear now to have reached an annual peak of acceptors; the number of new acceptors seems to have stabilized, while the decline of the birth rate appears to have slowed down or

¹See Annex 2 for population targets.

Table 5: Number of Acceptors by Method, and Coverage Achieved by Programs of 18 Countries (000s)

Country	Year	IUDs	Oral Contraceptives	Sterilization	Other Program Methods	All Program Methods	All Program Methods as a Percentage of Women 15-44 ⁽¹⁾
Ceylon	1966-69	68	55	18	19	160	>8.2
Colombia	1965-70	209	97	u	11	316	u
Ghana	1969-70	5	3	0	3	11	1-2
Hong Kong ⁽¹⁾	1964-70	76	55	4	149	284	51.
India	1964-70 ⁽²⁾	3,799	0	8,659	2,098 ⁽³⁾	u	14.9
Indonesia	1968-70	88	59	0	28	175	u
Iran	1966-70	36	627	0	u	662	>9.3
Kenya	1969-70	49	24	u	u	u	2.
Korea, Rep. of	1964-70	1,713	597	150	u	u	42.
Malaysia ⁽²⁾	1967-70	3	196	9	12	220	8.
Morocco	1964-70	41	25	0	0	67	3.
Pakistan ⁽²⁾	1964-70	3,277	6	189	u	u	4.
Philippines ⁽⁴⁾	1970	84	193	—	85	362	u
Singapore	1965-69	10	82	4	51	147	35.
China, Rep. of	1964-70	779	150	1	u	979	44.
Thailand	1964-70	248	207	34	0	489	>9.6
Tunisia	1964-70	66	24	9	20	108	12.
Turkey	1965-70	250	32	0	0	282	u

Symbols: u, unknown; >, greater than total.

⁽¹⁾Non-sovereign territory.

⁽²⁾Excludes Sabah and Sarawak.

⁽³⁾Annual number of acceptors is an estimate based on units of contraceptives supplied, the assumed relationship being one acceptor equals 130 units per year. Because of the arbitrary bias of this estimate, the cumulation of acceptors is not considered warranted.

⁽⁴⁾Acceptors for years prior to 1970 when a population policy was announced represent clients attending clinics that currently participate in the government program.

⁽⁵⁾To March 31, 1971.

⁽⁶⁾Users of conventional contraceptives, based on figures of distribution.

⁽⁷⁾This column refers to current acceptors of all program methods as a percentage of women aged 15-44 as of January 1971 except for India, for which the date is January 1970.

Source. Population Council, *Population and Family Planning Programs: A Factbook*, No. 2 (1971 edition), June 1971, New York.

even to have been reversed. The long-established programs in the Republic of China, Hong Kong, Republic of Korea and Singapore are in this situation.

In a number of countries—India, Malaysia, Pakistan and Tunisia among others—programs have been in operation for five or more years and a substantial operational infrastructure has been built up; however, performance has been uneven and there has not yet been a significant or demonstrable impact on their fertility rates. But even in the case of the more successful programs, it is clear that more effective education and motivation efforts and more and better family planning services could increase significantly the proportion of women practicing family planning, with consequently lower fertility levels.

Other countries are just beginning their programs and the number of acceptors is still increasing. These newer programs include those in Ghana, Indonesia, Iran, Philippines and Thailand.

In addition, many countries are moving gradually from limited voluntary efforts in urban centers to a larger scale of services but without any national population policy, although government health facilities may offer family planning services. As their scale of activities expands, these countries can learn from the experience of others and develop not only their delivery systems for contraceptives but also their programs of information, education, and the evaluation of results. Such countries include many of the 34 which have pioneering private associations affiliated with the International Planned Parenthood Federation (IPPF).

One estimate of the number of births averted by family planning programs was made by the Development Center of the Organization for Economic Cooperation and Development (OECD) in 1970. It indicated that 2.3 million births had been averted in 1968. Compared with what is needed to bring down the rate of population growth to acceptable levels within a reasonable period, this is far from adequate. Approximately 4.8 million births would have to be averted annually between 1970 and 1975, and more than ten times that many, or 60.5 million annually, between 1995 and 2000 if the population of developing countries were to reach a net reproduction rate of 1.0 by the year 2000 (Annex 1, Table 6).

Constraints on Family Planning

There is considerable unevenness in the strength of commitments to population control in developing countries, ranging from mere pronouncements to firm policies and programs with varying degrees

of budgetary support. This may reflect in part some of the difficulties which have limited the effectiveness of many family planning programs.

Politically, there is sometimes concern that support of population programs may be a liability, especially since the results of any program will not be immediately demonstrable but unfavorable misconceptions may be widespread: a belief, for example, that there is a correlation between population size and military power; a fear that ethnic balances within a country will be upset; or a suspicion that the advocacy by rich countries of lower growth rates for the poor is merely a new form of colonialism and an excuse for not providing adequate development aid.

Cultural and religious objections to family planning are still serious, even in areas where national programs exist. In some countries a family planning program would imply a complete reversal of practice, tradition and mores. Furthermore, where infant mortality is high and children are needed for the family work force, high fertility is to be expected.

Various administrative and organizational difficulties commonly beset governments in launching new programs. These are often serious limitations. No matter how earnest the political commitment, a family planning program cannot be effective unless there is an organizational structure capable of bringing the available technology to those prepared to make use of it. Family planning programs are inherently difficult to administer, since they must maintain continuing contact with married couples over a long period.

The difficulty is increased when services must be carried to a widely dispersed, and often illiterate, rural population. Moreover, there is seldom enough trained personnel to carry out a program of the required magnitude. Finally, there is the handicap of limited administrative experience on the part of many persons in the medical and social service professions, who in most developing countries are responsible for administering family planning programs.

There are also important technological constraints. Although contraceptive technology has made considerable progress in the last 15 years, so far there is no perfect contraceptive: highly effective, safe, inexpensive, easily used and reversible, and one which would not necessarily have to be delivered under medical surveillance. Oral contraceptives and the intrauterine devices (IUDs) are likely to be the best available means of contraception for some time to come, although experience has demonstrated that both have their limitations.

While research is producing variations and refinements of both "the pill" and the IUD, any radically new technique of fertility control must

come from basic research in reproductive physiology, which is expensive, complex and uncertain. For the present, family planning programs will have to operate with essentially the same methods known today. Improvements are on the horizon, but radical breakthroughs toward the "ideal" are not expected soon (see Annex 3).

Family planning programs normally include education and information components, although the exact type of activities carried out must be carefully tailored to allow for cultural sensitivities and religious beliefs. Education consists of the preparation of curriculum materials on family life and sex and their introduction into school curricula after suitable testing and training of teachers. The target group is principally the next generation of potential acceptors.

Information, or communication, activities are directed mainly to the present generation of potential acceptors. These may be reached through various forms of mass communication (radio, cinema, newspapers, posters, etc.), as well as through face-to-face contacts established by health personnel, social workers, or specially trained field workers. The education and information components are vital parts of any well conceived family planning program.

A final constraint on effectiveness is inadequate evaluation. Although considerable work has been done on the measurement of results of family planning programs, there is everywhere a long way to go before adequate reporting systems exist to provide information for management decision-making and program evaluation. Inadequate evaluation machinery limits assessment of a program's effectiveness in reducing fertility, the ultimate test of its success.

An adequate information system for evaluation would address itself to three questions in particular: (a) The structure and level of demand, to provide guidance for determining the priorities of the program's efforts among areas and population groups; (b) The effect of varying the level and mix of various program inputs, to suggest the combination likely to achieve best results; and (c) The effect of the program on reducing fertility, to provide a measure of effectiveness.¹

Program Costs

Financial expenditures on family planning programs have been modest in relation to national budgets (averaging about 1%) and, as noted in the previous section, very low in relation to the economic benefits of reduced fertility. To date, external assistance has carried a sizable proportion of the costs, usually more than 30%. Tables 6 and 7 give data for selected countries. The relatively low costs are

¹See Annex 4 for discussion of a desirable management information and evaluation system.

partly explained by the use of existing health services as the main delivery system.

In many cases, even when a population policy exists, program expenditure is too little in relation to the need. Because national family planning efforts are so recent, cost trends are available for only a few countries; in some (e.g., India, Republic of China) expenditures are increasing; in others the data show decreases. Cost projections and the level of foreign assistance needed in the next decade cannot be assessed with confidence on the basis of such limited experience, but informed estimates have been made which suggest orders of magnitude.

Table 6: Budgetary Position of Family Planning Programs in Selected Countries, 1968-1969 (US\$ millions)

Country	National Budget	Health ⁽¹⁾ Program	Family Planning Program	Foreign Aid for Family Planning	Foreign Aid as % of Family Planning Budget	Family Planning as % of Health	Family Planning as % of National Budget
China, Rep. of	823.0	64.4	0.6	0.5	87.1	1.0	0.1
India	3,141.9	70.8	49.3	18.9	38.3	41.1	1.6
Indonesia	646.3	n.a.	4.0 ⁽²⁾	n.a.	92.5	n.a.	0.1
Jamaica	218.3	18.5	0.5	0.2	31.7	2.9	0.3
Korea, Rep. of	984.8	7.7	4.1	2.0	48.8	52.8	0.4
Pakistan	996.6	46.0	19.1	14.9	77.9	41.5	1.9
Trinidad and Tobago	188.6	13.5	0.1	0.03	30.2	0.8	0.1

⁽¹⁾These data are not comparable on a country basis. Some countries do not show family planning costs independent of expenditures for health programs or do so to varying degrees. In some countries it is considered politically inadvisable to publish precise figures. Also, the data do not include the costs of private programs.

⁽²⁾Data for 1970-71.

In a staff study, the United Nations Fund for Population Activities (UNFPA) has estimated that it would be necessary for developing countries, if they were to carry out reasonably complete family planning programs on a broad national basis, to spend approximately 65 U.S. cents per capita per year. This figure increases to \$1 per capita if the costs of educational, motivational and system evaluation activities are included. These amounts are not small when translated into the proportions of national budgets they would represent, e.g., somewhere around 5%. Five percent is a much lower proportion than most governments normally spend on education (15% to 30%) or on national security, but it is about the proportion of total Ministry of Health expenditures in many low income countries.

Not even the most committed governments with the most successful programs are spending as much as half the per capita figures mentioned in the UNFPA study, and most are spending much less.

Table 7: Annual Per Capita Expenditure of Selected Family Planning Programs⁽¹⁾
(US cents)

China, Republic of	6.0	(1971)
India	7.72	(1968)
Indonesia	4.1	(1970)
Jamaica	37.0	(1968)
Korea, Republic of	10.4	(1969)
Pakistan	9.4	(1969)
Tunisia	16.8	(1969)

⁽¹⁾Based on funds from all sources—government, international, bilateral, and private.

Source: Population Council, *Population and Family Planning Programs: A Factbook*, No. 2 (1971 edition), June 1971, New York.

It is clear that population programs require important shifts in government priorities, which will frequently require fairly significant changes in budget allocations. Successful programs require substantial increases in both national and international inputs, public and private.

The Potential for Family Planning

How successful can family planning efforts be in reducing fertility over the next generation? No one knows. Not enough experience to serve as a guide has been accumulated in existing programs, most of which began only four or five years ago. Large areas of ignorance surround such key questions as the potential number of acceptors, since relatively little is known about the determinants of family size decisions and how open to change they may be among various social groups.

There is much debate among experts as to whether the present numbers of acceptors can be increased (a) primarily through the extension of services (an approach which assumes the existence of large numbers waiting to participate); (b) whether much more intensive information, communication and family life education activities would be more productive; or (c) whether much larger numbers of acceptors can be recruited only after basic socio-economic changes have taken place. Both research and further experience are needed to throw light on this fundamental question. Some inferences may be drawn, however, from recent experience:

- There does appear to be a correlation between a national program's supply capacity (i.e., the number of service facilities) and the number of women who make use of the program. This suggests that as a program's capacity is increased, it does gain additional acceptors, particularly in the early stages when those who can be most easily recruited are becoming acceptors. But there is also evidence that

programs in which insufficient attention is given to education and motivation do not succeed in recruiting anything like the proportion of women needed to reach national population goals. It seems clear that governments will have to give equal attention to both the supply and demand sides of the problem.

- Everywhere there are constraints to program expansion because of the already heavy demands on the medical services, inadequate numbers of trained personnel at all levels, inadequate and insufficient physical facilities, etc. But given the political will, such problems are not insurmountable over the long run (and, as indicated in the next section, these are areas in which the Bank can assist). Over the short run, there are possibilities for making use of non-medical personnel, in particular social workers, and using paramedical personnel more effectively in providing family planning services.

- As to long term demand for family planning services, three kinds of evidence suggest that it exists or can be developed:

- (1) Various knowledge, attitude, and practice (KAP) surveys indicate that most couples in developing countries want fewer children than they now have. The average number of children that a family "desires" is between four and 4.5, compared to actual family size of five to 5.7. In particular, many families which already have at least three children do not want more: in Hong Kong and seven developing countries,¹ 60% of respondents who already had three children and 70% of those with four said they did not want to increase their families (see Table 8).

These surveys have their limitations. For example, the replies of older respondents are influenced by their actual reproductive history. Moreover, an expressed preference for a given number of children does not necessarily mean that contraceptives will be used on the requisite sustained basis. Nevertheless, studies suggest that younger and better educated women want smaller families than their mothers did. If the evidence of the studies is accepted, it does appear that there is an unsatisfied demand for expanded family planning services.

- (2) The appallingly high incidence of illegal abortions in many countries, particularly in Latin America, clearly indicates an unmet need for family planning services.

- (3) The most successful family planning programs to date—in the Republic of China, Hong Kong, Republic of Korea and Singapore—have been conducted in countries where social pressures and the level of socio-economic development had already led to some decline in

¹Hong Kong 1967; Thailand 1965; Philippines (urban) 1969; Turkey 1963; Republic of Korea (urban) 1964; Tunisia 1964; India 1960-61; Indonesia 1963.

