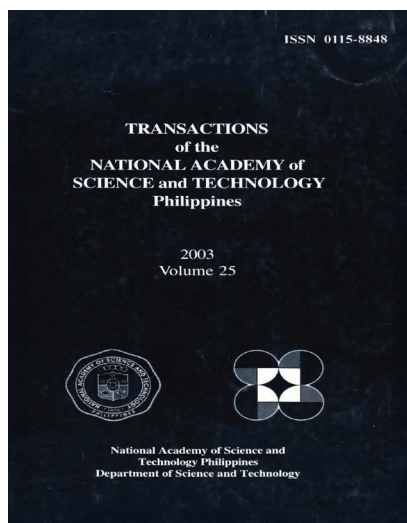


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Population: How and Why It Matters

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POPULATION: HOW AND WHY IT MATTERS*

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Abstract

The Philippines experienced a four-fold increase in population from 1948-2000. Based on previously published papers on population, this paper analyzes the effects of the country's demographic changes on economy, on poverty and family, on agriculture and natural resources, and their implications on economic, social and population policies.

Data have shown the negative effect of an increase in population on the economic growth of the country. The paper further explained this by describing the transition that the population would go through when fertility rate diminishes. According to studies presented, a country going through the demographic transition would first experience increase in the child dependency ratio, which will eventually be followed by an increase in the working age group and later on by the growing old-age dependency ratio. It was also concluded that an increase in fertility rate could lead to an increase in poverty rates and its intensity. This was supported by the general notion that poverty and large family size go together. Another problem caused by population growth is the issue of environmental degradation.

Based on these, five sets of policies were presented on maximizing the well being of individuals and families: (a) undo any existing policy-induced distortions; (b) institute a variety of economic policies that strengthen land, labor and financial markets and encourage broad-based income growth; (c) develop a range of social programs, including education and health programs; (d) promulgate policies and programs that improve the status of women; and (e) ensure availability of and access to family planning information and services.

Keyword: population policy, demographic indicators, Philippines, poverty

* Key paper in the monograph "Population: How and Why it Matters" Published by the National Academy of Science and Technology Philippines (2003); reprinted with permission from the author.

Introduction

The upsurge in world population from 2.5 billion in 1950 to over 6 billion in 2000 and estimated by the United Nations to level out at 11 billion by the year 2050 has attracted more attention globally than any other social phenomenon in the last 50 years. In comparison, the Philippines witnessed nearly a fourfold growth in population, from 19.2 million in 1948 to 76.5 million in the year 2000 with no leveling off in sight. The National Statistics Office, using the 1995 enumerated population as base, projected the number of Filipinos to reach some 106 million in 2020 and about 126 million in 2040, assuming that fertility will decline moderately to replacement level by 2020. But if fertility were only to attain replacement level a decade later, the estimated 2040 population would be 11 million more (Figure 1).

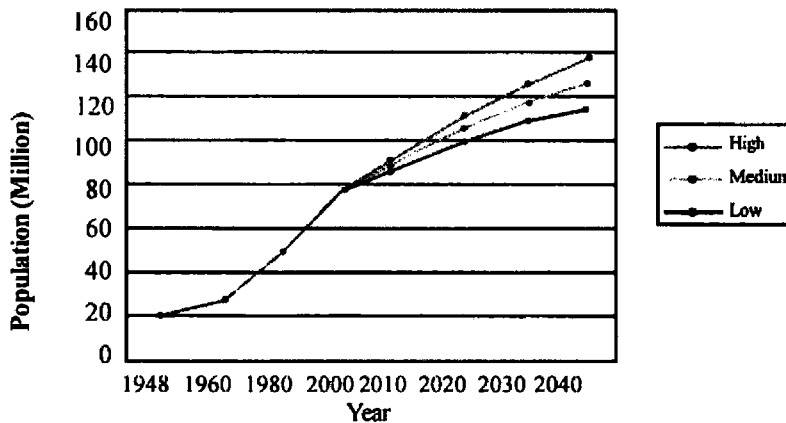


Figure 1. Growth of Philippine Population (in millions)

Source: National Statistics Office, Philippines

Measurements of the effects of mounting population numbers and their consequences have varied widely, extending all the way from the opinion that greater population growth leads to more prosperity to dire predictions that rapid population growth would bring about worldwide famines, ecological disasters, civil wars, natural resource scarcity, and the like. Focusing on the rapid population growth in the *developing countries and its consequences for economic growth, economists have raised two research questions: Has the rapid population growth of the last half-century been good or bad for developing countries' economic prospects? If bad, what government policies and programs to encourage lower fertility and thus reducing growth of population make sense for the economy and for individual and family welfare?*

The debate about these questions has often generated more heat than light

because they relate policies affecting the most personal and critical decisions of families concerning marriage, women's status, and childbearing. At the same time, the debate has aided the use of new theoretical and modeling insights in research and the exploitation of ever-improving data. To bring the issues to a wider audience and to broaden the scope of the debate, the National Academy of Science and Technology (NAST) held this Round Table on **Population: How and Why It Matters**. In doing so, the NAST hopes that the participants will take to heart the implications of the new findings for policy and embark on pertinent programs for their clientele, their communities and for society as a whole.

The sections that follow address the effects of the country's demographic changes on the economy, on poverty and the family and on agriculture and natural resource use and their implications for economic, social and population policies and programs. These are largely based on the report of a 1998 symposium, held in Bellagio, Italy, where economists and economic demographers took stock of the latest research on population issues (Birdsall et al, 2001) and on the writings of Herrin (2003) and Orbeta (2002), among others.

Population Change and the Economy

Using aggregate country data to ascertain the influence of population growth in the developing countries on increases in country level GDP per capita, Kelley and Schmidt (2001) concluded *"that rapid population growth, and its associated demographic components, appears to have exerted a fairly strong, adverse effect on the pace of economic growth over the period 1960-1995."* These more recent studies used better-specified models in which demographic variables were incorporated into the growth models. The studies also covered a longer time period over which it has been possible to observe the effects on economic growth of decreased fertility, varying labor force size and lesser youth dependency. These recent analyses considered not only population growth in the aggregate but distinguished carefully among the effects of alterations in the components of demographic change and population growth, including fertility, mortality and the dependency ratio. Changes in population size and density were also considered. *These analyses indicate that among demographic changes of the last 35 years, increases in population are positively associated with economic growth, while increases in the size of the age group under 15 are negatively associated with growth.*

Bongaarts (2001) emphasized that a decrease in fertility results in substantially altered age structures and age distribution, with gradually diminished proportions of the population under 15 and growing proportions 65 years and over. As countries go through the demographic transition of falling mortality followed after a lag by declining fertility, they first will face a period of rising child-dependency ratios, then of shrinking child-dependency ratios once larger proportions of the population move through the working ages, and eventually of

expanding old-age-dependency ratios. The effect of fertility decline during the stage wherein the ratio of the population of working age to the dependent population is high provides a *demographic dividend* or *window of opportunity* that allowed other East Asian countries in the last three decades to increase their savings rates and to invest in physical and human capital to spur their economic growth.

Williamson (2001) also saw alterations in East Asia's age structure during the last three decades as contributing significantly to that region's considerable rise in savings and investment for the same period, setting the stage for East Asia's prolonged period of historically unprecedented economic growth. Based on cross-country statistical analysis, Williamson concluded that *the increase in the working age population and the increase in savings induced by changes in dependency, can be associated with as much as one-third of the total average annual per capita growth of about 6 % in East Asia in the last three decades.*

Herrin (2002) took note of the sustained economic growth and the rapid pace of fertility decline in East Asia during the period 1965-1995. During these three decades, East Asia's average annual GDP growth per person was 6.6 % (the People's Republic of China (PRC) averaged 5.6) while Southeast Asia recorded 3.9 %. In contrast, South Asia's average was only 1.9 %. By 1995, the total fertility rate (TFR) in East Asia including the PRC was below replacement level. A rapid decline in TFR was similarly recorded in Southeast Asia with Thailand achieving replacement fertility in 1990-1995 (Table 1). Only the Philippines (with its slow economic growth and slow fertility decline) did not fit this general characterization. Herrin concluded that the rapid fertility declines in East Asian countries (the Philippines excepted) in the past 30 years was related to sustained economic growth. This slow fertility decline in the Philippines is related to an economic growth characterized by a cycle of growth spurts (at a relatively lower rate than East Asia) followed by a period of crisis in what is now known as the "boom-bust" cycle.

Kelley and Schmidt found that increases in the size and proportion of the working age population are positively associated with economic growth. The proportions of the population under age 15 and in the working ages 15-64 for the Philippines, Japan, the Republic of Korea and Thailand and the youth dependency burden (ratio of the population 0-14 to the population 15-64) are compared in Table 2. Although the Philippines has had a declining proportion of the youth and an increasing percentage of the working population, thus decreasing the youth dependency burden, the proportions are nowhere near those of the other three countries that have shown tremendous economic growth in the past three decades.

According to Balisacan (2003), the rapid economic growth in the major East Asian countries, averaging 6-9 % annually and sustained over two or three decades, was the key to their successful poverty reduction. In contrast, the Philippines' high absolute poverty level can be attributed primarily to the short duration and slowness of the country's economic growth.

Table 1: Economic growth, life expectancy, and total fertility rate (TFR) decline in selected countries in Asia

Region/Country	Average annual GDP growth per person 1965-95	First quinquennium of fertility decline*				
		Life expectancy at birth		Period	TFR during previous quinquennium	1995 TFR
		1950-55	1995			
<i>East Asia</i>	6.6					
Hong Kong	5.6			1965-70	5.3	1.2
Korea, Republic of	7.2	48	72	1960-65	6.1	1.6
Singapore	7.2			1960-65	5.8	1.8
Taipei, China	6.2			1955-60	6.4	1.8
People's Republic of China	5.6	41	69	1970-75	5.9	1.9
<i>Southeast Asia</i>	3.9					
Indonesia	4.7	38	63	1970-75	5.6	3.4
Malaysia	4.8			1965-70	6.7	3.3
Philippines	1.2	48	65	1960-65	7.1	4.1
Thailand	4.8	47	70	1965-70	6.4	2.2

*The first quinquennium with a decline in the total fertility rate of at least 10 % compared with the previous quinquennium.

Source: Herrin, 2003.

Fertility, Poverty and the Family

Analyzing economic and demographic data for 45 developing countries, Eastwood and Lipton (2001) found that elevated fertility levels increase absolute levels of both by retarding economic growth and by worsening the income distribution poverty of the poor available for consumption. The average poverty incidence in the mid-1980s was 19 %, about one in every 5 persons. Had all these 45 countries reduced their birth rate by 5 per 1,000 during the 1980s, poverty incidence would have dropped to 13 % between 1990 and 1995. Eastwood and Lipton suggested that in these 45 countries about half the estimated decline in poverty over the period could be ascribed to increases in economic growth and the remaining half to shifting consumption towards the poor. A fall of 4 per 1,000 in the birth rate, for instance, could translate into a 2.4 % decline in those living in absolute poverty in the next ten years. The studies also demonstrate that the poorer the country and the higher its initial fertility level, the greater will be the effect of diminishing fertility on a decline in absolute poverty. Moreover, as the demographic transition takes place, the beneficial effects increase. However, as Eastwood and Lipton maintain, the effects of the demographic transition on reductions in poverty are, as with the effects on economic growth, different at different stages of the transition -*harmful to poverty reduction in*

Table 2: Demographic indicators: Selected East & Southeast Asian countries, 1960-2000

Country & Year	Population 0-14 yr (%)	Population 5-64 yr (%)	Population Density per sq km	Youth Dependency Burden 0-14 / 15-64
Philippines				
1960	46.4	50.9	90	91.2
1970	45.7	51.4	122	88.9
1980	42.0	54.6	160	76.9
1990	39.5	57.1	202	69.2
2000	37.0	59.2	255	64.1
Japan				
1960	29.2	65.1	249	44.9
1970	24.0	68.9	276	34.8
1980	23.6	67.4	309	35.0
1990	18.4	69.1	327	26.4
2000	14.7	68.1	336	21.6
Republic of Korea				
1960	41.9	54.8	253	76.5
1970	40.0	56.7	322	70.5
1980	34.0	62.2	385	54.7
1990	25.9	69.6	433	37.5
2000	20.8	72.1	472	28.8
Thailand				
1960	44.4	52.7	52	84.3
1970	44.9	52.1	70	86.2
1980	39.2	57.5	90	68.2
1990	31.9	64.3	107	49.6
2000	26.7	62.9	122	39.3

Source: United Nations, 2001.

the early stages as population growth accelerates due primarily to mortality decline that occurs disproportionately among infants and children, and helpful in the later stages as fertility declines and aggregate population growth slows.

During the early stages of the demographic transition, income differentials between poor and non-poor households may in fact become greater. Once the transition extends to all groups in the society, so that fertility as well as mortality fall, and the fertility reduction spreads to poor households, the poverty-reducing and inequality-reducing effects increase. As the dependency ratio within families declines and childbearing cost is lessened, more income is available for consumption and savings, particularly where women enter the labor force and contribute to increasing family incomes. In sum, with a greater number of countries experiencing some fertility decline and with improved data on poverty changes at the country level, it has been possible to show that reductions in

fertility may well be contributing to a decline in poverty rates and intensity.

It is generally accepted that poverty and large family size go hand in hand. Eastwood and Lipton's study and Thomas Merrick's (2001) analysis confirm that in the developing countries, there is higher poverty incidence among larger households. Table 3 lists the poverty incidence in the Philippines by household size. It is evident that despite the reduction in poverty level over time, the poverty incidence is still considerable the greater the number of household members.

Table 3. Poverty incidence by family size

Family Size	Poverty Incidence					
	1985	1988	1991	1994	1997	2000
National	44.2	40.2	39.9	35.5	31.8	33.2
1	19.0	12.8	12.7	14.9	9.8	9.8
2	20.0	18.4	21.8	19.0	14.3	15.7
3	26.6	23.2	22.9	20.7	17.8	18.6
4	36.4	31.6	30.1	25.3	23.7	23.8
5	42.9	38.9	38.3	31.8	30.4	31.1
6	48.8	45.9	46.3	40.8	38.2	40.5
7	55.3	54.0	52.3	47.1	45.3	48.7
8	59.8	57.2	59.2	55.3	50.0	54.9
9 or more	59.9	59.0	60.0	56.6	52.6	57.3

Source: Orbeta, 2002.

Moreover, those poor households that have more children invest less in children's education and health, and systematically see worse health outcomes associated with pregnancy for mothers. Studies in the 1990s demonstrate that at least some fertility among the poor may be optimal to family welfare. It is altogether likely that poverty and high fertility do not cause each other but are both caused by other factors such as poor education. But it is also likely that there is a two-way causation, with poverty and high fertility inopportunely but-tressing each other in a vicious cycle. In fact, both theory and improved empirical analyses support the likelihood that high fertility of poor parents is contributing to their and their children's poverty.

At the household level, Herrin (1983) found that the number of young children 0-6 and 7-12 years old in the household inversely affected the accumulation of household assets. Mason (2001) also ascertained that the number of children

negatively affected the savings rate. Although the absolute amount of savings was unaffected, asset per child was discovered to be higher in lower fertility households.

The argument that the poor have larger family size as a result of rational choice is difficult to believe in the Philippine case. The poor do not really have better control over their fertility as clearly indicated by their more limited access to family planning and allied services, lower contraceptive prevalence rates, higher unwanted fertility and higher unmet need for family planning as revealed by Orbeta (2002) and by Pamaran and Ramos-Jimenez (2002). Orbeta is of the opinion that current fertility choices do not only have current effects but also have intergenerational impact. Evidence is overwhelming that high fertility leads to decreased investments in human capital, the main engine in the intergenerational transmission of poverty.

Population, Agriculture, and Natural Resources

Among all the possible effects of population size and demographic change on natural resource use, effects on land use in agriculture are probably the most relevant for developing countries. Any problem of population is more likely to be associated with unsustainable use of renewable resources such as land, rather than with non-renewable mineral resources.

Pender (2001) reviewed the growing empirical literature and supplied an example from Honduras of the kind of new study required. He concluded "that though rapid population increase may encourage technological innovation that leads to increased output, such population increase can also have a negative impact, especially in the absence of an environment that creates incentives for individuals and societies to manage natural resources in a sustainable manner." While the potential negative effect of population growth has been and can be hindered by policy and practices, *without collective action*, population density can make things worse in terms of agricultural output, land productivity, and most importantly, in terms of human welfare.

Over the period 1980-2000, the growth in rice production in the Philippines at 2.2% annually barely kept ahead of population growth as reported by Tolentino (2003). During the 1990s, the average annual growth in rice production averaged only 1.9%. Yet during the same decade, the Philippine population grew at an average of over 2.3%.

The country's rice imports as a proportion of total requirements rose from 1.1% in 1975-1979 to 8.1% in 2000-2001 (Table 4). Compared with its major rice-producing ASEAN neighbors, the Philippines was far behind in terms of productivity growth. Over the 1990s, rice productivity growth in Viet Nam spurred upwards while that of Thailand grew steadily (Figure 2). Stagnant growth in rice production, combined with rapid growth of population, explains why the country has lost its self-sufficiency in rice. In addition, while world rice prices remained

Table 4: Rice imports as % of total rice supply (TS)*

1975-1979	1.13
1980-1989	1.73
1990-1999	7.31
2000-2001	8.09

*TS=Production+Imports

Source: Tolentino, 2003

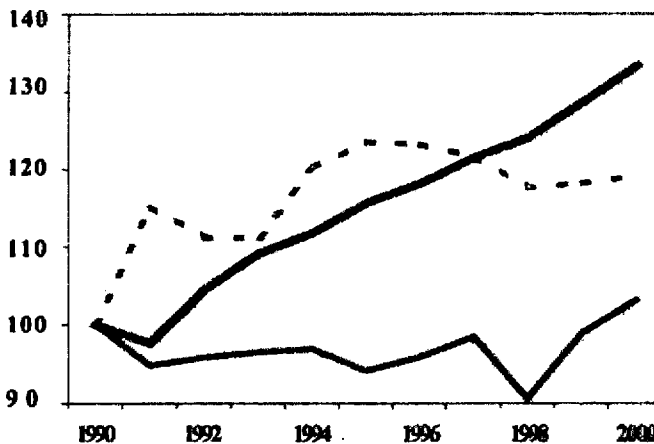


Figure 2. Trends in paddy yields Philippines, Thailand, Viet Nam (1990=100)

Source: Tolentino, 2003

relatively low and stable during the 1990s, domestic consumer prices were two or three times those of Viet Nam and Thailand. Because it is expensive, Filipinos consume less rice than other countries at similar levels of income and economic development (Table 5). Expensive rice also underlies poor nutrition. The gap between local and world rice prices has grown over the past decade, helping to explain worsening nutrition in the population, especially among the very young. In 1993, 8.2 % of children surveyed were underweight. Five years later, the corresponding figure grew to 9.2 %. During the same period, the proportion of wasted children rose from 5.9 % to 7.2 % (Table 6). According to Tolentino, “current rice sector policy is dominated by pervasive rice price interventions implemented through the monopoly on the international trade of rice by the National Food Authority (NFA), coupled with weak implementation of rice productivity-enhancing programs.” Tolentino concluded that this policy does not work and proposed an alternative: “sustained implementation of a significant program of public in-

Table 5. Rice per capita consumption

Country	Rice Consumption (kilos/head/year)
Bangladesh	150
Cambodia	169
Indonesia	149
Laos	172
Malaysia	92
Myanmar	213
Philippines	96
Thailand	109
Vietnam	165

Lower due to lesser supply, higher price!

Source: RiceFactsIndex: www.riceweb.org/aginfoasia.html

vestment in rice productivity for grains in the long-term, financed and enabled in the short-term by a pragmatic trade policy where tariff revenues from rice imports are directed to public investments in rice sector development. To ensure that the gains from improved productivity translate into improved welfare for the population, the efforts toward increased productivity in the medium- to long-term must be complemented by a sustained program which enables choice among individuals and families with regard to childbirth and family size leading to moderation in overall population growth."

Table 6. Child malnutrition, Philippines

	1993	1999
	Percent	
Underweight	8.2	9.2
Stunted	5.4	5.4
Wasted	5.9	7.2

Source: National Nutrition Surveys (Tolentino, 2003)

The concern towards better management of resources and the environment has triggered studies that focus on the relationships between population, resources and the environment. While the issue is not new, it has gained primacy as resources continue to dwindle rapidly and demand rises with growing population.

Payanatu (1994) recently reviewed the relationship between population growth, environment and development. He concluded that while on the surface

rapid population growth is correlated with deforestation, soil erosion, destruction of local ecosystems and general environment degradation, a closer look revealed that it is more how population *behaves* rather than how population *grows* that determines the impact of population on the environment. Even then, it should be noted that how population behaves is affected by population size, congestion and shortages.

Jha et al. (1993) pointed out that one key relationship between population and environment is that demand on the resources rises in proportion to population size, holding per capita income constant. In addition, estimates made by the Environment and Natural Resources Accounting Project (ENRAP) (Orbeta and Indab 1996) reveal that households are the primary generator of pollutants. Thus, increases in the number of households due to population growth imply generation of more pollutants. In the same vein, Padilla (1996) pointed out that while deterioration of water quality may not be directly attributable to population size or growth, it is related to activities that are directly proportional to population size or growth.

Policy Implications

The new findings described above do suggest that there are costs to parents and/or society as a whole, in terms of lower economic growth. In many developing countries, the costs are in terms of reduced success in eliminating poverty. These new findings put together a compelling set of arguments and evidence indicating that high fertility makes poverty reduction more difficult and less likely. Lower aggregate fertility has and is likely for some period to improve the lot of the poor. Thus, interest in population growth and change in the developing countries can be directly linked to regard for the welfare of parents, children and families.

Constant high fertility at the country level prevents the significant shift in age structure now bolstered by empirical evidence as advancing economic growth in various developing countries. This finding is important in attempts to decrease poverty because economic growth is a critical element for poverty reduction at the country level. By slowing economic growth, high fertility exacerbates poverty. The effect though indirect is substantial and as demonstrated by Eastwood and Lipton, accounts for one-half the 'damage' that high fertility implies for increased poverty.

High fertility diminishes the chances for the poor to elude poverty and may also decrease their relative welfare. At the country level, higher past levels of fertility are associated with a greater incidence and intensity of poverty. As Malthus suggested, higher past fertility increases the availability of workers

and decreases their wages and, all other things remaining the same, raises the demand for, and the price of, such 'wage goods' as food.

Evidence is mounting that the high fertility of poor families may not be most satisfactory for family welfare even when it is apparently consciously chosen, and that some fertility among the poor is unwanted or unintended. With few opportunities to accumulate human capital and other assets, the poor may end up worse off with more children. This may be due to their being unaware of, or unable to respond to, changed indicators of the costs and benefits of children to them, and of siblings to their children. These conditions almost always reflect one or another market failure that harms the poor disproportionately.

The following sets of policies and programs combine the macro analysis of economic consequences of aggregate demographic change with the micro emphasis on maximizing the well-being of individuals and families:

1. Undo any existing policy-induced distortions such as those that limit access to education, access to information or services about health and family planning or that actively discriminate against women.
2. Institute a variety of economic policies that strengthen land, labor and financial markets and encourage broad-based income growth. These are likely to reduce fertility (and mortality) not only indirectly because they are associated with faster income growth, but also directly by undoing the barrier that families face where they cannot accumulate financial savings because capital markets are poor. Thus, they turn to children as a form of old-age security. Undo the restriction that poor land owners face where property rights are not legally protected forcing them to turn to sons to physically defend their land rights. Properly functioning markets should also guarantee that the age composition changes associated with mortality and fertility decline end up contributing substantially to economic growth because they interact positively with sound economic policies as apparently happened in East Asia.
3. Develop a range of social programs, including education and health programs. Research reveals that more education and better health lead to lower fertility. Some public financing of such social programs, particularly if targeted at the poor, can probably be justified in most settings, independently of any demographic impact. Such programs help close the gap between private and social costs and benefits of family spending on child education and health.

4. Promulgate policies and programs that improve the status of women, such as special access to micro credit for women. In some settings women do not share in childbearing decisions. Since women bear more of the costs and receive fewer of the benefits of childbearing, it may be that their full participation in the decision would ultimately lower their fertility.
5. Ensure availability of and access to family planning information and services. Since there are social benefits to lower fertility, both for economic growth and for poverty reduction, and given the considerable evidence of unwanted fertility and market failures that limit private access to family planning, an economic case can be made for non-coercive programs of reproductive health and family planning.

Constructing a hierarchy of policy interventions is difficult. Therefore, a mix of policies and programs is more likely to make sense because these policies and programs lead to other social and economic benefits while also lowering fertility and mortality. Furthermore, they do not introduce trade-offs in terms of improving individual well-being. Many of these policies and programs are relatively low in cost and have multiple social benefits that probably exceed private benefits. They may even be costless as in the case of sound economic policies or the elimination of distortions that restrain individual choices. This is very true of basic education, especially for girls, and for primary health care.

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