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Pakistan

Rapid Population Growth in Pakistan Concerns and Consequences

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CURRENCY EQUIVALENTS /a
(annual averages)

| <u>Year</u> | <u>Rs Per US\$1.00</u> | <u>US\$ Per Rs 1.00</u> |
|-------------|------------------------|-------------------------|
| FY79 | 9.90 | 0.101 |
| FY80 | 9.90 | 0.101 |
| FY81 | 9.90 | 0.101 |
| FY82 | 10.55 | 0.095 |
| FY83 | 12.75 | 0.078 |
| FY84 | 13.48 | 0.074 |
| FY85 | 15.16 | 0.066 |
| FY86 | 16.13 | 0.062 |
| FY87 | 17.17 | 0.058 |
| FY88 | 17.55 | 0.057 |

/a Since January 8, 1982, the exchange rate for the rupee has been managed with respect to a weighted basket of currencies.

GOVERNMENT OF PAKISTAN
FISCAL YEAR

July 1 to June 30

Note: Historical data in the report refer only to the present nation of Pakistan, i.e., the former West Pakistan, unless otherwise specifically noted.

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ABBREVIATIONS

| | |
|-------|---|
| AHP | Accelerated Health Program |
| BHU | Basic Health Units |
| FATA | Federally Administered Tribal Areas |
| FPAP | Family Planning Association of Pakistan |
| FWC | Family Welfare Centers |
| HED | Household Economic and Demographic Survey |
| IEC | Information, Education and Communication |
| IFPRI | International Food Policy Research Institute |
| IMR | Infant Mortality Rate |
| LFS | Labor Force Survey |
| MCH | Maternal and Child Health |
| NGO | Non-Government Organization |
| NGOCC | Non-Government Organizations Coordination Council |
| NIS | National Impact Survey |
| NRR | Net Reproduction Rate |
| NWFP | North West Frontier Province |
| PCPS | Pakistan Contraceptive Prevalence Survey |
| PDS | Pakistan Demographic Survey |
| PFS | Pakistan Fertility Survey |
| PGE | Pakistan Growth Estimation |
| PGS | Pakistan Growth Survey |
| PLM | Population, Labor Force and Migration Survey |
| PWD | Population Welfare Division |
| RHC | Rural Health Centers |
| RHS | Reproductive Health Service |
| RIBM | Revised Indus Basin Model |
| TFR | Total Fertility Rate |

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EXECUTIVE SUMMARY

Introduction

1. At a time when many developing countries are experiencing a rapid decline in their fertility rates, Pakistan's remains almost as high today as it was twenty years ago. Careful analysis of available demographic data (Chapter 2, paras 2.09-2.12) suggests that Pakistan's total fertility rate (TFR) was about 6.5 in 1985. Although this figure may have declined slightly since that time, it is higher than the official government estimate of 5.8. Nonetheless, the implications are clear: a typical woman in Pakistan can expect to have about six births by the end of her childbearing years. Other countries with similar income levels, alarmed by the problems associated with high fertility, have taken an active stand to moderate it. Indonesia's fertility rate dropped from 5.5 to 3.6 between 1965 and 1986. India and Bangladesh now have TFRs of 4.5 and 5.6 respectively. China, using more radical methods, has a TFR of 2.3.

2. Pakistan's fertility rate remains high because neither the modern means by which couples can regulate their fertility (family planning) nor the socio-economic environment in which fertility decisions are made (female education and employment, for example) have changed sufficiently in recent years. Thus, Pakistan's high fertility, coupled with a moderate decline in infant mortality, produces a population growth rate of about 3% per year, among the highest in the world. With sustained rapid growth, Pakistan's population will exceed 200 million by 2010; by 2025, it will be almost 300 million. The percentage of women of childbearing age has been increasing steadily, adding to the difficulty of moderating future growth. Some 45% of the population are below the age of 15, and require substantial care and services.

3. This report lays out micro- and macro-level consequences of continued high fertility which seem particularly relevant for Pakistan. Two population growth scenarios, one with a more rapid reduction of fertility than the other, are used to highlight the impact of continued rapid population growth. Although varying in degrees of seriousness, taken as a whole the consequences are sufficiently serious for Pakistan, especially for the well-being of low-income families, to warrant a strengthened, broader population policy. The report thus lays out the major dimensions of such a comprehensive population policy. The first aspect is a broad array of programs that go well beyond family planning. The second aspect is the need for immediate implementation, because of the long lag between policy action and effect. The third aspect is the need to prepare for, and to adapt to, a population that will unavoidably continue to grow for at least four decades, and whose characteristics and needs will differ from those of the long term, stationary population. How Pakistan's existing programs fit into this framework--as well as suggestions for further strengthening of these programs--concludes the report.

Population Projections

4. Two population growth scenarios are derived for purposes of this report, one with a more rapid fertility decline than the other (Chapter 2). The high population growth scenario assumes the continuation over the next few years of current trends and the TFR drops slowly from 6.5 in 1985 to 5.9 in 1996-2000. After the turn of the century, the pace of decline accelerates as the factors supporting high fertility weaken and the TFR falls to 4.0 by 2020. The low population growth scenario assumes that fertility has already begun to fall and will continue to fall quite rapidly. This assumption implies a very effective population policy. The TFR is assumed to decline to 4.6 in 1996-2000 and reach 2.8 by 2020. The decline in the infant mortality rate is the same in both scenarios. Consequently, under the high scenario, the population would reach 203 million by 2010, 260 million in 2020 and 450 million in 2050. Under the low scenario, the population in 2010 would be 175 million, in 2020, 210 million and 300 million in 2050. The Seventh Plan population growth targets fall between the two scenarios, although earlier Plans have used targets closer to the low scenario.

Consequences of Rapid Population Growth

5. Pakistan has made good economic progress to date despite the rapid growth in its population. Real GDP today is about seven times as high as it was after independence and per capita income has doubled. The economy has become more modernized and diversified. Industry, public utilities, and services now generate 50% of GNP. Open unemployment is reported at only 4%. Agriculture has given the population an average caloric intake above the recommended United Nations average. Nonetheless, there are real costs at both the micro- and macro- levels associated with the continuation of rapid population growth.

6. Micro-Consequences. The costs of continued high fertility fall heaviest on the most vulnerable members of society: women, children, and the poor. The tripling of the population since independence has left a legacy of unmet social needs:

- o Infant mortality is high. Pakistani children are ten times as likely to die before their first birthday as children in developed countries. Infant mortality is higher in Pakistan than in India and Sri Lanka.
- o Educational attainment is exceptionally low. Seventy percent of the adult population cannot read or write; 45% of the current primary age group are not enrolled in school.
- o An estimated 30% of Pakistan's population live below the poverty line, in either rural areas or urban "katchi abadis" (squatter settlements) with inadequate nutrition, poor sanitation and housing, and little access to public services.

- o Pakistan's women bear a disproportionate share of these social deficits. Adult literacy among women is an estimated 16%. Only 3% of rural 12-year-old girls are currently in school, and only one girl out of three has gone to school in the past. Women have shorter life expectancies than men, because of the mortality risks associated with frequent childbearing.

7. Continued rapid population growth will affect these groups all the more:

- o With large family size and short intervals between births, mothers' and infants' mortality and health risks increase (Chapter 3). Children born close together are less likely to survive their first five years of life. Pregnancies at the extremes of a woman's childbearing years (less than 20 and over 35) are also detrimental to the survival of both mother and child.
- o Pakistan has about 18 million children below the age of 5 today. By the year 2000, there will be 26 million, if rapid population growth continues. Their future, and that of the country, lies in how well they are cared for. Malnutrition and poor health in the formative years can damage the physical and mental capacity of children as adults.
- o School-age children and youth will be in an environment of intense competition. Their ability to get an education is impaired by (a) the need to start working at a young age to contribute to family income or to help at home, and (b) the shortage of (quality) schools. Labor force participation for boys in Pakistan (35%) is already high compared with other developing countries. Girls seem less likely to attend school when there are young children to be cared for in the family (Chapter 3). In view of present low primary school attendance, large numbers of children will continue to enter the labor force without the benefit of any formal education, even if universal primary education is achieved by the year 2000. They also will face increasingly stiff competition for jobs, as they join the million other people entering the labor force yearly.
- o Rapid population growth will frustrate efforts by the poor to escape poverty. Children who must help support their families tend to forego education, and even if they attend school it is likely to be of the poorest quality. Rapid growth of the labor force will tend to hold down wages. Although larger families may have higher total family income as more family members work, income per capita will be lower. Moreover, each additional child reduces household savings, which are not necessarily recouped later when the child begins working as an adult (Chapter 3).

8. Macro-Consequences. While it is difficult to estimate the overall relationship between rapid population growth and GNP growth for Pakistan, there are sufficient serious consequences in a number of macro-areas, that potentially affect GNP growth to be worried (see below). Both a slowdown in the long-term rate of GNP growth as well as the diversion of national product among a larger number of people would reduce per capita income gains. Even assuming continuing rapid economic growth of about 6% per year, it will take almost 25 years to double the present level of per capita income with present population growth rates of about 3%. Should the consequences of rapid population growth have a dampening effect on the GNP growth rate, per capita income growth would be further slowed. On the other hand, with slower population growth and the same GNP growth rate (6% p.a.), per capita income would double in less than 20 years. In essence, the trade-off is between a large population with a low standard of living, as opposed to a smaller population with a higher standard. This not only affects the quality of life for the people of Pakistan, but also the kind of development possible for the country.

9. At the macro-level, the consequences of continuing on a high population growth path are heaviest in four areas. These are analyzed in Chapters 4-6 of the report and are summarized below (paras. 10-19). They are:

- (a) The country will have to contend with higher public expenditures and/or shortfalls in government services. This runs counter to current policy to reduce the fiscal deficit.
- (b) Growing unemployment, underemployment and/or low wages are almost inevitable in the longer run.
- (c) Low levels of human capital formation will perpetuate low labor productivity growth and probably be detrimental to economic growth.
- (d) Lower aggregate household savings will also constrain economic growth.

In contrast, the pressures on agriculture in the medium term could be offset by better management, and use of water and complementary inputs to raise yields.

10. Higher Public Expenditure Requirements: Improving provision of public services, a high priority for the present government, for the population is more difficult with rapid population growth. Conversely, poor coverage, low quality and minimal use of certain services is itself a cause of sustained high fertility. Chapter 4 examines the cost of improving service quality in education, health, and urban services--three areas where service delivery is currently inadequate. Some 7-8 million children are currently not enrolled in primary school. While 70% of the population live in rural areas, 80% of the doctors are found in urban areas. Some 30% of the urban population live in substandard katchi abadis. Improving these and other services for the existing population--as the Government is committed to doing--is already a costly proposition. Continued rapid population growth increases the cost or, alternatively, adds to the shortfall in service provision.

11. Total private and public expenditures for these services are directly related to the number of people served. With the use of minimal standards and a large private sector role (in health and urban infrastructure services), reducing the existing shortfalls in service under the more optimistic population growth projections would increase public expenditures by about 0.6% of GNP by 2000. With continued high population growth, instead, the additional demands of these three services on the consolidated budget would amount to an estimated 1% of GNP by 2000. Although initially modest, this differential would continue to increase, reaching almost 1.5% of GNP by 2010.

12. Although the added expenditure burden is not infeasible, it comes at a time when Pakistan is striving to reduce the fiscal deficit. Also, the estimates are conservative. Inclusion of more public services, such as rural electrification, housing and infrastructure provision, improving service quality, and failure to make use of the private sector when warranted could increase the differential demands on the Government budget. This would require an added tax effort. Lowering the rate of population growth could help avoid the necessity for such measures.

13. Labor Supply Problems: Unemployment, or the companion under-employment and low wages, would be greater with continued rapid population growth (Chapter 5). Yesterday's births have ensured that the labor force will grow more than 3% per year beyond the year 2000. Projections show that, even with GDP growth of 5-6% per annum, unemployment is likely to triple between 1985 and the year 2000, based on historical labor absorption capacity. Youth unemployment would increase faster than unemployment among older workers, as the proportion of workers aged 10-24 increases to 41% by 2000. The rapid economic growth and large scale emigration of the last decade, which helped Pakistan avoid large labor surpluses, are not guaranteed for the future.

14. The positive effects of moderated population growth on the labor force are long-term in nature. The resulting drop in the unemployment rate would not be felt until after 2000. It will also take some time for the youthfulness of the labor force to moderate.

15. Labor Quality: Without a reduction in population growth, improvements in labor force quality will be further constrained (Chapter 5). The difficulty of raising the human capital of a labor force already handicapped by low levels of literacy and modest education levels could very well affect the potential for growth. The ability of the urban work force to deal with sophisticated technology, and farmers, with new methods and effective management of inputs, is related to literacy. While rising school enrollments will gradually increase the educational level of the labor force, the majority of workers who are currently illiterate will not benefit. Hence, even assuming universal primary education by the year 2000, only about 50% of the labor force is expected to be educated by then. With moderated population growth, over 85% of Pakistan's labor force would have a primary education in 2025; unabated population growth would reduce that percentage to less than 70%.

16. Lower Private Savings: The growth in private household savings, at a time when increased aggregate savings are needed for higher investments, could well be affected negatively by large family size. In Pakistan, families with large numbers of young children tend to save less out of each additional rupee of income than those with fewer children (Chapter 3). With an age structure already heavily skewed toward children, savings at the macro-level would be depressed by the large number of families with dependents to support compared to families whose children have grown up and entered the work force.

17. Improving Agricultural Yields: Population growth in Pakistan, in contrast to many other developing countries, need not run into agricultural supply bottlenecks in the near future. The conventional view of population pressure on land--that agricultural yields decline because of population pressure at the very moment that food demand increases--is not supported by historical evidence in Pakistan (Chapter 6). The widely documented shift toward smaller farm holdings in Pakistan is due to land tenure changes caused by the agrarian transformation of the 1960s, not to population pressure. In addition, the decline in farm size has not reduced yields. Although Islamic inheritance laws may have helped reduce the size of holdings, family holdings tend to be operated as consolidated units for economic efficiency reasons. To date, there does not seem to be surplus labor in agriculture. Real wages for male casual agricultural labor more than doubled between 1970 and 1987. Pakistan seems to face labor shortages during seasonal peak periods, the result of rapid economic growth and opportunities for emigration to the Middle East.

18. Constraints to agricultural output growth in Pakistan seem to be due more to supply and management of physical inputs than to population pressure. Water availability has limited land extension and yields. Since extension of irrigation is only possible at greatly increased costs, more efficient water use offers the best hope for increasing the land under irrigation. (Water conveyance losses for instance, are estimated at up to 40%). In addition, better management of other complementary inputs--fertilizer, plant protection, seeds, supported by effective research and extension, credit and distribution services--offers scope for raising agricultural yields. While yields have been increasing, they are still below their potential.

19. However, rapid population growth could become a growing constraint to agricultural productivity through its erosion of the natural resource base. Pakistan has already suffered extensive deforestation and loss of range lands, exacerbated by the inflow of Afghan refugees since 1979. With less than 5% of the country under forests, future fuel wood sources, silting of rivers and dams, and bio-diversity are major concerns. Waterlogging and salinity are serious problems in the Punjab and Sind. As much due to poor resource management as to population pressure, these resource issues become more urgent with continued rapid population growth. 1/

1/ While not analyzed in the report, increased population densities in the cities and industrial expansion are also polluting air and water.

The Need for Policy Intervention

20. High fertility thus imposes costs on individuals, families and society at large. It also has a momentum of its own. Failure to deal with rapid population growth today will make it harder to deal with in the future. More education, higher income, and more jobs for women tend to reduce fertility. Thus, failing to educate today's children, provide them with adequate jobs, and raise their living standards postpones the time when a nationwide fertility reduction can be expected. In addition, growing unemployment probably would intensify pressures to keep women out of the labor market or confine them to low productivity jobs, leaving a large share of Pakistan's human resource base underutilized.

21. If the experience of Europe, North America, and the developed countries of Asia is any guide, as Pakistan becomes more industrial, urban, and wealthy, and as women become a more central part of life outside the home, fertility rates eventually will fall. Pakistan must decide whether it can afford to wait and whether it can live with a much larger population size. 2/ The evidence presented above suggests that it would be preferable to accelerate the process of fertility decline.

22. Pakistan already has many of the programs needed for an expanded initiative to reduce fertility. Two things are now required--to significantly strengthen these programs within a broader framework, and to realize the tremendous payoff in making these programs work better.

Features of a Comprehensive Population Policy

23. Broad Population Agenda: Accelerating the process of fertility reduction will require both a strong desire among parents to regulate their fertility and the commitment of Government to reduce national fertility. These in turn will mean, first of all, a broad population policy to reduce fertility across several fronts. Family planning, as the principal means for regulating fertility, is key to this effort. However, as will be explained below, population policy should go well beyond family planning programs. Sri Lanka, Indonesia, and Kerala (India) have reduced fertility rates by combining an active family planning program with widespread distribution of education and health services. Similarly, Thailand has used health, nutrition, and family planning successfully.

24. The first objective is to increase family planning practices among those parents who wish to have smaller families. There seems to be substantial unmet demand for family planning. As reported by the Contraceptive Prevalence Survey, 43% of all currently married women interviewed did not want any more children. However, only 14% of these women were currently using any form of contraception.

2/ Pakistan's eventual stationary population could exceed in size that of Bangladesh and Indonesia, and it could become the third most populous country in the world after China and India.

25. The relevant programs include:

- o increasing access to family planning methods to permit birth spacing in accordance with parents' desires.
- o increasing the available range of birth spacing methods.
- o improving information, education, and communication (IEC) strategies, to reach the public.

26. The second, equally important objective of population policy is to reduce the desire of parents for many children. In some cases, it is primarily a matter of making parents aware that they can control their fertility. Poor families, however, often have little choice. The perceived economic benefits of children--particularly the need for their help on the family farm or enterprise, and the need for economic security in old age--tend to outweigh the costs. There is also some chance involved--the inability to plan precisely for a certain number of children, given high infant and child mortality rates and the lack of access to the means for family planning.

27. Economic development eventually is accompanied by more control of fertility. There are a number of ways to accelerate the process in Pakistan:

- (a) Continue to reduce infant and child mortality rates. While serving to keep population growth in check, current high infant and child mortality rates are both a cost to society and a factor working against fertility decline. Not only is there a need to have more births to insure enough surviving children; in addition, the death of a child shortens the period when a woman is unlikely to fall pregnant. Therefore, reducing child mortality rates goes hand-in-hand with controlling births, and vice versa. Among the more promising programs in this area, are comprehensive maternal and child health services (MCH), nutrition programs, and clean water and sanitation programs (which reduce the incidence of water-borne diseases).
- (b) Reduce poverty. Poor families find it costly to provide their children with adequate nutrition, medical care, and education. Direct costs are large relative to their limited incomes and, in the case of education, there is also the loss of children's help and/or earnings in the process. But "human capital investment" would significantly improve the children's economic future, as well as having a positive impact on fertility reduction, ^{3/} and help

^{3/} Educated women marry later, want fewer children, and practice family planning more. Therefore, they not only have fewer children; they also lose fewer of their children in their first years of life because of better child spacing, nutrition and hygiene. Their own children also have more education.

eliminate poverty. Anti-poverty programs should therefore promote human capital development, primarily among children but also among adults. Indeed, the Pakistan Government may wish to consider extending the provision of food, medical care, and primary education for the infants and young children in the poorest families free of charge or at a reduced cost, since the welfare benefits of these expenditures to society are so large.

- (c) Increase the "cost" of having many children. Making it more costly to have children in Pakistan could increase parents' likelihood of controlling their fertility. A number of Asian countries use tax policy, bonuses and subsidies to favor small families; in China, the disincentives for large families are quite severe. Rather than raising the direct cost of large families, Pakistan might wish to focus on their indirect or "opportunity" cost. Children can be considered costly if they prevent mothers from working. Providing more job opportunities for women ^{4/} would work in the direction of having fewer children and help delay the age at marriage. Among the most appropriate programs and policies for improving work opportunities for women are:

- o universal primary education and better access to secondary education;
- o adult literacy and training programs, which reach adult women who have not been through the formal school system;
- o improvement of the work environment for women, by such means as enabling labor legislation, special facilities/housing for female workers, and perhaps child care facilities.

28. To be most effective, these population policies need to be supplemented by broader developmental and social policies. General economic policies which raise incomes and employment opportunities are important. Improving the position of women before the law, the family, and society in general also has a large payoff, in terms of:

- o greater acceptance of and freer access to family planning and MCH services;
- o greater school participation by girls;
- o greater acceptability of women working outside the home and family farm;

^{4/} Women are a large segment of the labor force in other Asian countries, working both before and after marriage. Young women prior to marriage have been employed productively in Japan (for textiles), Korea and, most recently, Malaysia (for textiles and electronics).

- o raising the age at which girls marry; and
- o increasing the female staff for education, family planning and health services.

29. Long Gestation Period. The second feature of a comprehensive population policy agenda is the need for immediate implementation, in view of the lag between actions and outcomes. First, the effects of many of the policies outlined in the previous section will not be visible for many years, because attitudes and traditions must be changed in the process. Family planning programs will have the quickest effect, to the extent that they reach parents who already desire smaller families. However, initiatives designed to reduce the desire for large families--involving direct behavioral changes--are more indirect and long-term in nature. Most of these--notably reduction of infant and child mortality, education, facilitating the employment of women outside the home, and other anti-poverty initiatives--will bear noticeable results within ten years, at best.

30. Second, population growth, while amenable to policy interventions, takes many years to abate. Because of the long life span of individuals, several features of population growth for the next 10-15 years have largely been determined already, the result of past decisions and population policies. Table 1, which compares the alternative population results of a more and less ambitious decline in the fertility rate, shows several sobering facts:

- o Pakistan's population will double by the year 2020, no matter how active population policy is in the near future. This is because mothers of the next generation have already been born, and they are far more numerous than their mother's generation.
- o Labor force growth will continue at over 3% per year well into the next century, regardless of population policy interventions. As with mothers, most labor force entrants have already been born.

TABLE 1. PROJECTED POPULATION CHARACTERISTICS UNDER
ALTERNATIVE POPULATION GROWTH SCENARIOS ^{a/}

| | <u>Millions</u> | | | <u>Average Annual Growth Rate (%)</u> | | |
|---|-----------------|-------------|-------------|---------------------------------------|------------------|------------------|
| | <u>1985</u> | <u>2000</u> | <u>2020</u> | <u>1990-2000</u> | <u>2000-2010</u> | <u>2010-2020</u> |
| <u>Total Population</u> | | | | | | |
| High Scenario | 96.2 | 151.3 | 263.7 | 3.1 | 3.0 | 2.7 |
| Low Scenario | 96.2 | 140.0 | 210.4 | 2.5 | 2.2 | 1.9 |
| <u>Age Composition</u> | | | | | | |
| High Scenario | | | | | | |
| Ages 0-4 yrs | 17.5 | 25.9 | 36.8 | 2.6 | 2.3 | 1.3 |
| Ages 5-14 yrs | 25.3 | 41.9 | 66.9 | 3.2 | 2.6 | 2.2 |
| Low Scenario | | | | | | |
| Ages 0-4 yrs | 17.5 | 20.3 | 23.0 | 1.1 | 1.2 | 0.0 |
| Ages 5-14 yrs | 25.3 | 36.2 | 45.6 | 1.7 | 1.3 | 1.0 |
| <u>Labor Force</u> | | | | | | |
| High Scenario | 42.9 | 69.1 | 133.2 | 3.4 | 3.4 | 3.3 |
| Low Scenario | 42.9 | 68.3 | 116.0 | 3.3 | 2.8 | 2.5 |
| <u>Women of Child Bearing Age (15-49 yrs)</u> | | | | | | |
| High Scenario | 20.4 | 32.9 | 64.3 | 3.4 | 3.5 | 3.3 |
| Low Scenario | 20.4 | 32.9 | 55.4 | 3.4 | 2.9 | 2.4 |

^{a/} The two projections differ principally in terms of the total fertility rate (TFR) defined as the number of children that would be born to a woman during her childbearing years, in accordance with prevailing age-specific fertility rates. Under the low population growth scenario, the TFR is assumed to decline rapidly, from 6.5 in 1985 (base year) to 4.6 in 1996-2000 and 2.8 in 2016-2020. Under the high population growth scenario, the TFR is assumed to drop more slowly, to 5.9 in 1996-2000 and 4.0 in 2016-2020. The decline in the infant mortality rate is the same in both scenarios. Chapter 2 provides more details.

31. These long-term lags require a farsighted view by policy makers and adoption of a forceful population policy now. These lags should not be an excuse for inactivity. With an active policy which emphasizes an aggressive family planning program, some important results can be achieved by the year 2000:

- o The total population would be 11 million smaller, and the doubling of today's population would be postponed by ten years.
- o There would be about 5.5 million fewer children aged 0-4, reducing home care and public service requirements.
- o The number of primary school age children (5-9) would be lower by over 4 million, reducing the education demands on the Government budget by 0.4% of GNP.
- o Although the labor force in the year 2000 would remain virtually unchanged, the cumulative efforts of the reduction in school age children as well as more education would begin to be felt in the labor force shortly thereafter.

32. Interim Management of Population Growth. The third aspect of a comprehensive population policy is the management of continuing rapid population and labor force growth in the period of fertility transition. During this period, Pakistan will need to manage:

- o a youthful population, with over 40% below the age of 15;
- o rapid labor force growth, with much of the labor force young and relatively inexperienced (40% would be between the ages of 10-24 in 2000) or illiterate.
- o a population born predominantly in rural areas (where 70% of the population now reside) but likely to move increasingly to urban areas, where infrastructure and services often require more organization and cost.

33. Providing essential services and jobs with this demographic profile represents a challenge, especially in view of the existing social deficits and the public expenditure constraints imposed by continued need for prudent fiscal and balance of payments policies. The country's recently adopted medium-term policy framework should provide the basis for sustained economic growth, with attendant employment opportunities and a stronger fiscal base. Nevertheless, the larger question remains. Is Pakistan as well prepared as it could be to manage the unavoidable rapid population growth of the next 10-15 years?

34. The critical issues on the provision of essential services are the following:

- o Reduction in unit costs of providing housing and water by reducing unnecessarily high standards, by full utilization of facilities, and by more efficient organization and management.

- o Mobilization of additional resources, by greater cost recovery from beneficiaries. University fees, which currently cover less than 10% of annual operating costs, for example, could be raised. Since cost recovery and quality of service go together, it is desirable that additional revenues are used to achieve an improvement in service quality. Decentralization is an essential part of this objective.
- o The private sector is active in education, health and certain urban service provision. Scope for expanded private sector participation in other services, such as urban solid waste collection, should be explored.

35. Employing the growing labor force involves the following issues: 5/

- o Doing more to reduce distortions in the price of labor versus capital by, for example, reforming the trade regime and reducing the subsidy on interest rates, as well as amending labor legislation.
- o Assisting dynamic small enterprises, which use local labor and indigenous technology, in obtaining credit, infrastructure, and other services.
- o Improving the utilization rate of Pakistan's agricultural land, especially large holdings which are lying idle.
- o Making basic industrial training programs more accessible to the lesser qualified and the rural labor force.
- o Exploiting new opportunities for young men to emigrate to take the pressure off the domestic labor market in the short-term. To remain competitive in the Middle East with other Asian workers, Pakistan may need to offer workers as part of a package of integrated services.

The Use of Existing Programs

36. Pakistan already has many of the programs on which to build a broad population policy. Its long-established program in family planning, plus its newer initiatives for immunization and basic health care, for extending basic water and sanitation facilities, and for expanding primary education, are important in the reduction of fertility as well as improving living standards and income. The focus on alleviating rural poverty, first during the Sixth Plan supplemented by the Five-Point Program and currently by the People's

5/ A more thorough discussion of these issues is contained in Report on Employment Issues in Pakistan, The World Bank, Report No. 7523-PAK, December 1988.

Development Fund, is commendable. So is its commitment to sustained economic growth, as reflected in its economic policies of the 1980s and by the recent adoption of the medium-term adjustment program.

37. However, the commitment to fertility reduction, together with the effective implementation and aggressive use of existing programs, needs to be strengthened. The growing imperatives for reducing population growth and the long interval between policy actions and outcomes suggest that only an expanded, sustained effort will be successful. Recommendations for improving the effectiveness of four existing programs--family planning, MCH, basic water and sanitation, and primary education--are given in the report (Chapters 4 and 8). The main messages are summarized below.

38. Family Planning Program. In 1965, Pakistan became one of the first developing countries to introduce a population program with explicit fertility reduction goals (Chapter 7). However, it seems to have had little effect on fertility. Some problems with GOP's past experience are:

- o Neither the private sector (the principal health service provider), nor the public primary health service have offered family planning services in a consistent way;
- o Pakistan's family planning effort has probably reached no more than 25% of the population. Of this less than half can be attributed to the public sector;
- o Although visits to Family Welfare Centers have increased, clients seem to regard them as alternative sources for health care rather than sources for family planning or maternal and child health care;
- o Past and current family planning strategies have narrowly emphasized supply, not demand. Simply handing out contraceptives does not convince people to use them;
- o Population programs have had to operate in a hostile environment where most of the factors associated with high fertility (low literacy, low status of women) reinforce each other;
- o Structure and central control have been emphasized at the expense of decentralization and supervision;
- o Monitoring and evaluation are poorly developed, and targets are set unrealistically high;
- o Not enough attention has been paid to female staff development.

39. Contraceptive use is currently low in Pakistan and has played a minor part in past fertility reduction (Chapter 2). However, it is critical to any meaningful decline in the fertility rate. In a composite of 31 countries which had experienced a total fertility reduction in the order of five births, more than 70% of that fertility reduction occurred through greater use of contraception. To achieve even the slow fertility decline projected in the

high population growth scenario, a doubling of contraceptive usage by the year 2000 will be needed. This is an ambitious task in itself, judging from the experience of other developing countries. If a more rapid fertility decline is sought, contraceptive usage will have to increase even faster.

40. An effective family planning program is key to moderating Pakistan's population growth rate. The current program incorporates a number of positive features. For instance, the Population Welfare Division (PWD) has created a network of Family Welfare Centers to encourage changes in reproductive behavior; offered surgical contraception to women at its Reproductive Health Service Centers; and encouraged non-governmental organizations (NGOs) to become involved in family planning issues and service delivery.

41. More still needs to be done. Organizational and operational recommendations are discussed in Chapter 8. The most important of these changes would be the integration of family planning services with MCH services, and the offering of these through health outlets as well as hitherto family planning outlets. Many of the recommended policy and program changes will cost little additional resources since they generally use existing facilities and staff.

42. This integration inter alia would enable wider distribution of contraceptives. Among current users, the majority obtain their contraceptive supplies and services from either a hospital or from a drug store. PWD centers, which supply contraceptives and services, are few and far between. Although not extensively utilized, public sector health units and centers offer much wider coverage of the country than PWD centers but presently tend not to offer family planning services. There is also an important role for expanded commercial distribution of contraceptives. Other Islamic countries (e.g. Bangladesh, Egypt) have used social marketing programs extensively. The social marketing of condoms in Pakistan is promising, and should be broadened to include oral contraceptives.

43. Even with a fully integrated family planning/MCH service and improved distribution of contraceptives, more needs to be done to educate the population on the benefits and means of family planning. Women need to be actively sought out in their homes, communities and work places. This should be supported by clear, sensitive and sustained messages from the highest government levels that rapid population growth is a serious development problem and requires the active cooperation of all concerned. Indonesia and Bangladesh, for example, have succeeded in desensitizing the subject, with the country's leaders actively engaged in the public campaign.

44. Until quite recently, efforts to influence demand for family planning through Information, Education and Communication (IEC), advertising and outreach have been weak. Building on lessons learned from early mistakes, PWD is increasing public awareness of family planning issues in general and knowledge about different contraceptive methods. Methods that are suited to women who have completed their desired family size--e.g. sterilization--are now receiving the most publicity. More emphasis needs to be given to methods

suited to the postponement of a first birth (e.g. the pill, IUD and injections). The benefits of childspacing for infant, child and maternal health should also be stressed.

45. Health and Water Programs. As indicated above, reducing infant and child mortality is crucial for reasons of health and fertility reduction alike. With strong Government activity in this area, prospects for a continuing decline in mortality rates are good. The Accelerated Health Program, launched in 1983, is successfully immunizing all children under 5 years against the six most common infectious diseases and immunizing pregnant women against tetanus (Chapter 7). Combating diseases that cause diarrhea, another major cause of infant death, through oral rehydration therapy and the training of traditional birth attendants are two other important programs. With sound management and a well-designed mass media campaign, achievements to date are impressive. Despite present success, there is no room for complacency. By the year 2000, between 4.0 to 5.2 million children would need to be immunized, depending on how rapidly fertility can be reduced. This is a 40-80% increase over the volume of immunizations in 1988.

46. The immunization program is one important aspect of the Government's broader Maternal and Child Health (MCH) services. During the Sixth Plan, the Government established the Primary Health Care Program which extends MCH services to the rural population. Despite sizable government investment in this program, coverage and use are low even with minimal fees. The private sector remains the principal service provider, although it emphasizes curative rather than preventive care. There remains a need for MCH services by the Government, targeted to rural areas and in poor urban neighborhoods. Suggestions for strengthening the program are given in Chapter 8. Among the most important is the addition of family planning and pre- and post-natal care for the mother to the program, which now focuses on child care. Appropriate staffing and training, adequate drugs and related supplies and transportation, and more outreach are also needed.

47. Basic water and sanitation would also reduce diarrheal diseases, which now account for 45% of child deaths. Only 35% of the rural population currently have access to adequate, clean water, and 17% to sanitation facilities. While urban service levels are substantially better, the poor are not well-served. Few sewerage systems include treatment, and untreated sewage is frequently discharged directly into open drainage canals and rivers.

48. Planned government investments in rural water and sanitation are expected to triple in the 1986-90 period over 1983-88 levels. Such levels of investment would need to be sustained until about 2000 to achieve an acceptable level of coverage. In addition, an integrated approach is needed. Supporting improvements in sanitation and hygiene education are necessary to realize the full health benefits of investments in water. Such an approach requires close cooperation between the provincial and local government departments. To effectively improve urban water and sewerage levels, provincial and local governments must be able to finance the full costs of new supplies--which does not rule out cross-subsidization in favor of the poorest. Water tariffs are usually well below the cost of operation,

maintenance and expansion of systems; as a result, there is wastage of water, inadequate maintenance and poorer service levels. A special effort is needed in the smaller cities, where service lags behind the larger cities.

49. Toward Universal Primary Education. Improving primary education and literacy, particularly for women, would reduce fertility through several channels. It is an area squarely within the responsibility of Government; it also has received high priority in recent years. School enrollments for girls, while still low, has improved substantially in the past two decades. Under the Sixth Plan, there has been rapid growth in public education expenditures, especially at the primary level. Estimates for 1988 suggest an allocation of 2.4% of GNP for education relative to 1.6% in 1983. However, Pakistan's education system still lags behind its South Asian neighbors. As a result of historically low levels of public investment in the sector, the system is characterized by poor coverage, low participation rates, high dropout rates, and poor quality.

50. The current Government objective to achieve universal primary education within the next 10-15 years is commendable and feasible. However, it will put great demands on the public purse (Chapter 4). These demands would be reduced with an active family planning program, since primary education is one of the early beneficiaries of lower fertility. Nonetheless, in view of present low school participation ratios, devoting increasing resources to education is inevitable if universal primary education is envisaged by the year 2000. Education expenditures will need to grow an estimated 7-8% in real terms annually to the year 2000, resulting in a budgetary commitment in that year of 3.3-3.7% of GNP (depending on the rate of population growth). These projections are based on low unit costs--Rs. 740 per pupil (\$45). If improved quality also is sought, budgetary requirements will be even larger.

51. These additional resources are feasible but will require a continued commitment to domestic resource mobilization. It will also require more of a shared responsibility for education among central, provincial, and local governments than now exists. Among the more important management and operational changes are: 6/

- (a) Improving the balance between recurrent and development expenditures. The present focus on school construction has not been accompanied by adequate complementary expenditures for teacher recruitment and training, books and other teaching materials, and maintenance of school facilities.

6/ A comprehensive analysis is given in "Pakistan: Education Sector Strategy Review", The World Bank, Report No. 7110-PAK, 1988.

- (b) Increasing decision-making and accountability at the provincial and local levels. Reflecting the provinces' almost total dependence on federal funding for education, management is highly centralized, making it difficult to adapt broad policies to local circumstances and diluting incentives for good performance by local administrators and staff. While changes toward decentralization can be taken now, effective decentralization of decision-making ultimately cannot be separated from decentralization of financing responsibility.

CHAPTER 1

INTRODUCTION

1.01 Rapid population growth at the national level translates at the micro-level to a large number of large families. But one cannot separate aggregate population growth from individual fertility decisions, family level infant and child mortality, or from the forces that affect these things. Nor can one discuss the relationship between population growth and economic growth at the national level without understanding the two-way nature of the interaction. The rate of population increase may affect growth of national product (GNP) through its effects on, inter alia, private and public savings, human capital formation and agricultural yields. At the same time, GNP growth, through its effects inter alia, on individual families' income, the employment and wage prospects of individuals and the ability of Government to provide appropriate health, education, and other public services, also influences fertility and mortality rates, thereby affecting population growth. The subject of population growth, its causes, consequences, and the nature of policy intervention, is thus complex. This chapter is designed to help the Reader understand these complex relationships and to set in context those sectoral aspects of population growth explored in detail in subsequent chapters.

The macro-linkages.

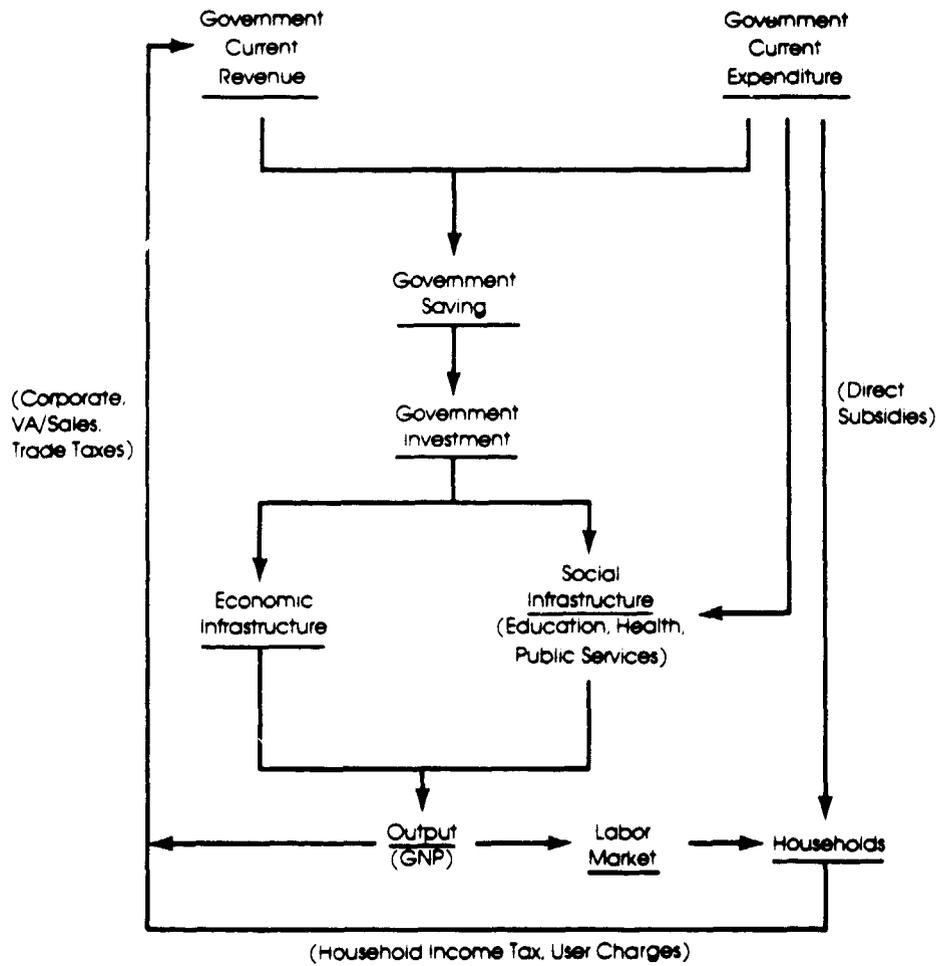
1.02 At the macro-level, the analytical framework encompassing the major population-economic linkages under consideration and their relationship to the household is laid out in diagrammatic form in Figures 1.1 and 1.2. The general framework has been widely discussed in the economic literature. 1/ It uses an economy-wide production function approach which emphasizes the linkages between population growth and inputs of labor, capital (through savings and investment), and land, as well as technological change.

1.03 Figures 1.1 and 1.2 describe, in simplified form, the population-output linkages of most relevance to this report:

- o Family members work in order to earn income. The more persons who want to work, the more rapidly the labor force grows. This can depress wages and/or result in growing underemployment and unemployment.
- o Through their consumption of goods and services, households provide a market for the country's production. The consumption

1/ R.A. Easterlin, ed., (1980) Population and Economic Changes in Developing Countries, Chicago: NBER; D.G. Johnson and R.D. Lee, ed., (1987) Population Growth and Economic Development: Issues and Evidence, The University of Wisconsin Press.

Figure 1.2: The government module



mix depends on household income levels and family size and age composition; consequently, the rate of population growth affects the country's consumption pattern as well as total market size.

- o Households also are a major contributor to the nation's savings. Large families (i.e. many children) have large consumption requirements which tend to reduce their ability to save. Since rapid population growth is associated with large families, this can have a negative effect on the country's savings rate.
- o The demographic characteristics of households have implications for the government budget, which in turn has a relationship with public savings and the fiscal deficit. Governments typically provide economic and social infrastructure to support production and improve living standards. Demand for these can be influenced by the rate of population growth.
- o Agricultural output, which is sensitive to labor, land, and water inputs, can be adversely affected by rapid population growth. Through division of land holdings among multiple heirs, farm sizes may diminish to a size which effects land productivity (i.e. yields). In large farm families, unpaid family labor is often used in excess, resulting in low labor productivity at the margin. Population pressure can also add to the degradation of cultivable land, forests, and water resources, contributing to a diminution of the natural resource base.

1.04 In the interest of simplicity, the analytical framework and diagrams abstract from several factors relevant to Pakistan. First, external migration is ignored. The most important migration flow of recent years has been the emigration of male workers to the Middle East. The magnitude of this emigration and its effect on the domestic labor market are discussed in Chapter 5. Second, the urban dimension of rapid population growth is not explicitly treated, although it is addressed in the context of public service requirements (Chapter 4). Urban growth depends on both rural-urban migration and urban fertility and mortality rates. Migration from one area to another is primarily affected by income differentials but may be affected by population pressures in addition. 2/ Third, although "rural" is treated as synonymous with "agriculture," and "urban," with "industry and services," there is in fact a substantial amount of all types of economic activities in rural Pakistan.

The micro-linkages

1.05 The macro-view of the population-economic linkages hides the true extent to which fertility, mortality and the number of surviving children affect the lives of individual families. The number of children in a family can be a pervasive force in determining the quality of family life. On the one hand, there are economic advantages associated with large numbers of children--they provide assistance on the farm and in family enterprises, they support parents in their old age--as well as non-pecuniary advantages--the

2/ See National Research Council, Population and Economic Development, p. 68, for migration surveys.

pleasures and status of children, the importance of carrying on the family name. On the other hand, there can be many disadvantages associated with large numbers of children. For example:

- o The number and frequency of births can have negative health consequences for the family:
 - infant and child mortality are typically higher with the close spacing of births and when children are born to women under 20 and over 35;
 - maternal mortality usually rises with high parity, close spacing of births, and births at the extremes of childbearing years;
 - the health of mothers and young children can be adversely affected.
- o The number of children in a family affects the current and future income potential of the family and, more broadly, the prospects for socio-economic betterment related to the educational achievement of the children. Three issues are particularly relevant:
 - both child and parental labor participation can increase with additional children;
 - children can be withheld from school because of opportunity costs--boys can be expected to help support the family and the girls can be expected to help with the household chores and care for younger siblings;
 - households may find it more difficult to save when children are young.

1.06 The advantages and disadvantages associated with large family size and the strength of the relationship, vary across countries. Verifying the significance and direction of the individual relationships for Pakistan is, therefore, one of the objectives of this report.

1.07 Determinants of Family Size. The number of surviving children in a family is a combination of the number of live births (fertility) and infant and child mortality. The developmental factors which appear to be more important in reducing fertility and mortality are higher family income, higher educational attainment of the parents, labor force participation of women outside the home, and better health and sanitation practices. The total number of births in developing countries--including Pakistan--is often considerably higher than the number of children desired by parents. This is because of the need to compensate for the fact that some children will not survive beyond the early years of their lives; but more importantly, it is the result of poor knowledge of family planning and little use of child spacing techniques. Reducing infant and child mortality therefore also reduces fertility over and beyond its direct impact on the nation's health. At the same time, increased use of family planning has substantial infant, child and maternal health benefits that go beyond reduced fertility.

Population Policy

1.08 High fertility bestows costs as well as benefits on families. As the economic environment changes--especially with the move to an industrial, urbanized, modern society with higher income levels--the factors which support high fertility typically weaken and fertility rates fall. This has been the experience of the now-developed countries of Europe, North America and Asia 3/ and in time it is likely to also be the experience of Pakistan. The question, however, is whether Pakistan can afford to wait for that time to come. Evidence presented in subsequent chapters suggests it cannot. There are two additional factors that suggest the need for urgency. First, the current rate of population growth in Pakistan is considerably higher than that found in today's developed countries when at comparable stages of development. This is the result of dramatic progress in lowering mortality rates and the spread of modern medicine which, though positive, serve to increase the rate of population growth in the absence of counteractive fertility control measures. Second, Pakistan's current rate of population growth is higher than in many other developing countries with similar levels of per capita income, including neighboring India, because of sustained high fertility. An acceleration of the process of fertility moderation therefore seems in order for Pakistan.

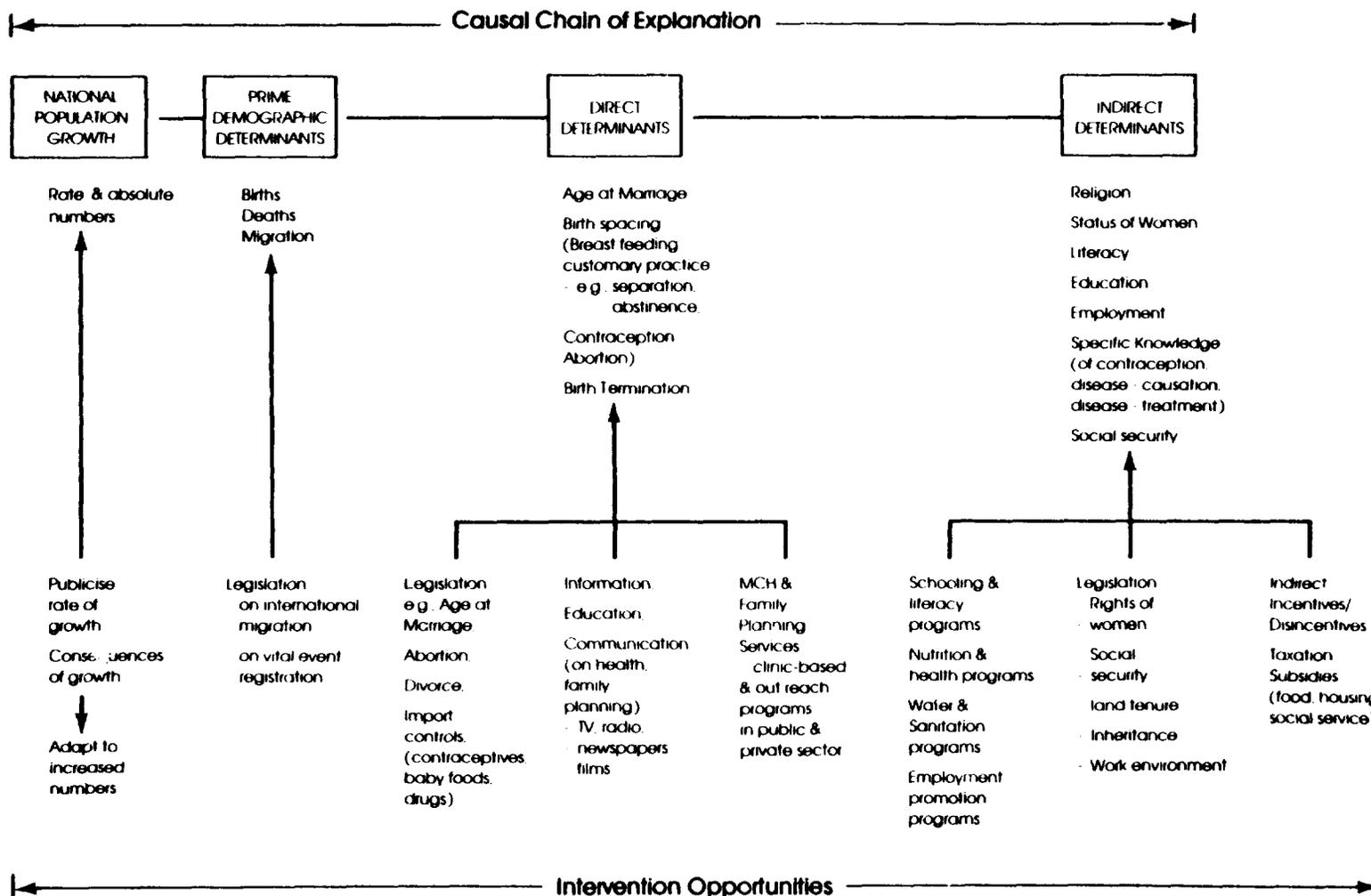
1.09 Figure 1.3 shows the range of possible interventions that influence population growth and which constitute a comprehensive population policy. Interventions are numerous but fall into two distinct categories: direct population policy measures and indirect population policy measures. The first group consists of those policies which influence present and future fertility and mortality in a direct manner, that is through their impact upon age at marriage, birth spacing and birth termination. Included here are laws on age at marriage, abortion, and divorce; IEC on health and family planning; MCH/family planning services, in particular, ante-natal and post-natal care, encouragement of breast-feeding, and supply of contraceptives; and improved nutrition, clean water and sanitation. Most of these policy interventions have an immediate impact on fertility. The second group of policies (indirect policies) influences the socio-economic-cultural-religious environment in which the direct determinants of fertility, or individual fertility decisions, are made. These include such diverse matters as religion; status of women; general literacy and specific knowledge of fertility factors; labor market conditions; social security arrangements; and fiscal policies. These interventions typically impact on fertility in the longer run. 4/

1.10 There is a third set of policies that relate to the need for a country to prepare for, and to adapt to, a growing population. In particular, a country like Pakistan with a rapidly growing population is faced with:

3/ Notably Sri Lanka, Indonesia, Thailand and parts of India. See Kuznets, S. (1966), Modern Economic Growth, Yale University Press. The World Bank, World Development Report, 1984.

4/ General development policies also have fertility/family size implications. Their impact is usually long-term in nature. For example, trade, fiscal, and deregulation policies which, by raising GDP and employment growth, eventually affect fertility by changing the labor market and income prospects of the family.

Figure 1.3 The range of possible interventions to influence population growth



- o a youthful population, with over 40% below the age of 15 whose needs differ from those of adults;
- o rapid labor force growth, with much of the labor force young, and relatively inexperienced or illiterate;
- o rapid urbanization as the urban population grows through natural reproduction and rural-urban migration.

Providing essential services, infrastructure and jobs with this demographic profile requires both adaptation of existing policies and introduction of new policies. Policies that address, for example, the efficiency of public service and infrastructure provision, the relative prices of capital and labor, employment regulations and training programs, and labor emigration are of uppermost importance.

Structure of the Report

1.11 While recognizing that many advantages are derived from children, the focus of this report is on several of the potentially negative features of high fertility which seem particularly urgent in Pakistan. The report focuses on the impact of rapid population growth on the family and on selected aspects of the national economy. The report also examines past GOP attempts to moderate fertility. It concludes by suggesting some of the policy interventions needed to achieve a more successful moderation of fertility in the future.

1.12 The report is organized as follows. Chapter 2 summarizes the current demographic situation, focusing on recent trends in fertility and mortality rates. It then assesses prospects for the future and presents two sets of population projections. The next four chapters analyze some of the likely consequences of rapid population growth on family outcomes and well-being (Chapter 3), social service requirements and the Government budget (Chapter 4), on the labor market (Chapter 5), and on agricultural yields (Chapter 6). Both present and future dimensions are explored in these chapters, and attention is given to sectoral policies that will help Pakistan adapt to its growing population. The remaining two chapters deal with population policy and programs. Chapter 7 examines the experience of past and present family planning and health care programs in stimulating fertility reduction. Finally, Chapter 8 explores the need for and the possible dimensions of a more active and broad-ranging population policy.

CHAPTER 2

DEMOGRAPHIC PROFILE, PROSPECTS AND PROJECTIONS

Introduction

2.01 Since the time of partition in 1947, which caused one of the greatest migrations in the history of mankind, the population of Pakistan has grown from about 32 million 1/ to a currently estimated 105 million. At current rates of growth the population is doubling every 23 years. By the year 2010 Pakistan will have over 200 million people, of which about 75 million are likely to be city dwellers. But the rate of population growth could further accelerate before beginning to decline and the 200 million mark could be reached before 2010. The reason for this is that, like so many developing countries, high fertility coexists in Pakistan with fairly high mortality. While prospects for a continuing decline in infant and child mortality (the bulk of total deaths) are good, prospects for an early decline in fertility are not. Although the benefits from an early decline in fertility are manifold (see Chapter 3-6), Pakistan will inevitably face a growing population for decades to come. Serious consideration of the accommodation of the population is therefore called for.

2.02 This chapter explores Pakistan's recent demographic profile, emphasizing recent trends in fertility and mortality, the key determinants of population growth. 2/ The chapter then examines the prospects for a decline in these vital rates and presents population projections to the year 2030. These population projections form the basis of analysis throughout much of the report.

Characteristics of the Population

2.03 Censuses are the most complete source of data for assessing population size, structure, density and distribution. First conducted in 1901 by the British, Pakistan has seen four full population counts since

1/ The first official census following independence was carried out in 1951 when the population was found to be 33.7 million.

2/ External migration has been important in the country's past but it is assumed to play a lesser role in the future.

Independence. Census results are presented in Table 2.1. 3/ The most recent census of 1981 counted 84.25 million people, suggesting a 3.1% annual growth rate in the decade since the previous census of 1972. 4/

2.04 Although not high by South Asian standards, Pakistan's population density has increased from 43 persons per square kilometer in 1951 to 106 persons per square kilometer in 1981 (Annex 2, Table 1). Punjab is the most densely populated province (230 person/sq.km.) followed by North West Frontier Province (NWFP), Sind, and the mostly desert Baluchistan (a sparse 12.5 persons/sq.km.). Average household size (6.7 persons for the country as a whole) is greatest in the Federally Administered Tribal Areas (FATA) (8.3 persons) and Baluchistan (7.3 persons), followed by Sind, NWFP, and Punjab.

2.05 In 1981, 24 million persons (28% of the total population) lived in cities, a considerably higher proportion than the 16% (5 million people) who were city dwellers in 1947. While population almost tripled between 1947-81, the urban population increased nearly four times. The high 4.4% annual inter-censal urban growth rate estimated during 1972-81 (Table 2.2) arises from a high rate of natural increase in urban areas, 5/ rural-to-urban migration, expanding urban boundaries (e.g. Peshawar, Islamabad and Quetta) and the redesignation of formerly rural to urban areas. In a typical year in the 1980s, the urban areas of Pakistan grew by about 1.18 million persons; 64% of these were born there, 30% migrated from rural areas and 6% were added by annexation of existing areas. Around 10 million people, 36% of Pakistan's urban population, is concentrated in two large cities, Karachi and Lahore. However, growth of other urban centers has been equally important during the past thirty years.

3/ The figures in Table 2.1 do not include the populations of Azad Kashmir and the Northern areas; nor does the 1981 figure include Afghan refugees, present in Pakistan at the time of the census.

4/ The apparent high inter-censal growth rate between 1961 and 1972 is thought to be due to the improved coverage of the 1972 census rather than an acceleration in the growth rate.

5/ Unlike the experience of most countries, Pakistan's urban fertility is not significantly lower than rural fertility. Although in recent years, postponed marriages have begun to lower urban fertility, reduced length of breastfeeding has in part negated this effort. See Sathar, Z. (1979) "Rural-Urban Fertility Differentials," Pakistan Development Review, Vol. 18, No. 3, and Casterline, J. (1984) "Fertility Differentials" in eds. Alam, I. and B. Dineson, "Fertility in Pakistan: A Review of Findings from the Pakistan Fertility Survey," ISI, Voorburg, Netherlands.

TABLE 2.1: POPULATION CENSUS TOTALS 1901-1981
(Figures in Thousands)

| <u>Census Year</u> | <u>Population</u> | <u>Rate of Growth</u> |
|------------------------|-------------------|---------------------------|
| 1901 | 16,576 | |
| 1911 | 19,382 | 1.6 |
| 1921 | 21,100 | 0.9 |
| 1931 | 23,542 | 1.1 |
| 1941 | 28,282 | 1.9 |
| 1951 | 33,740 | 1.8 |
| 1961 | 42,880 | 2.7 1/ |
| 1972 | 65,309 | 2.9 1/ |
| 1981 | 84,254 | 3.1 1/ |

1/ Adjusted intercensal growth rates.

TABLE 2.2: GROWTH IN TOTAL URBAN AND RURAL POPULATION OF PAKISTAN
DURING THE INTER-CENSAL PERIODS BETWEEN 1951 and 1981

| Census Years | POPULATION (in 000s) | | | ANNUAL INTERCENSAL GROWTH | | | Ratio of Urban to Rural Growth |
|-----------------|----------------------|------------------|------------------|------------------------------|-------|-------|---|
| | Total | Urban | Rural | Total | Urban | Rural | |
| 1951 | 33,780 (100) | 6,019 (17.8) | 27,761 (82.2) | 1.8 | 4.1 | 1.4 | 2.9 |
| 1961 | 42,880 (100) | 9,655 (22.5) | 33,225 (77.5) | 2.4 | 4.8 | 1.8 | 2.7 |
| 1972 | 65,309 (100) | 16,593 (25.4) | 48,716 (74.6) | 3.7 | 5.4 | 3.3 | 1.6 |
| 1972* | 65,309 (100) | 16,218 (24.8) | 49,091 (75.2) | | | | |
| 1981 | 84,253 (100) | 23,841 (28.3) | 60,412 (71.7) | a)3.1 | 4.4 | 2.6 | 1.7 |
| | | | | b)3.1 | 4.4 | 2.5 | 1.8 |

Source: Table 1, Abassi, N. (1987) "Urbanization in Pakistan 1951-1981." PIDE Research Report 152, Islamabad.

Note: Population percentages are given in parenthesis.

* Adjusted according to the 1981 definition of urban.

a) Calculation based on unadjusted 1972 figures.

b) Calculation based on adjusted 1972 figures.

2.06 Data on rural-urban migration, an important source of urban growth, are rather limited but the 1981 Census shows that more than half of all internal migrants migrated from rural to urban areas. These migrants typically originated in Punjab or NWFP and often migrated long distances to Karachi, the fastest growing urban settlement. Most rural-to-urban migrants are males in search of work and are concentrated in the 15-39 age group.

2.07 The bulk of past international migration, in recent times predominantly to the Middle East, has also been young males concentrated in this age group. A number of estimates of the stock of migrants in the Middle East exist, but the estimate of 1.8 million is considered to be a good approximation of the situation in the early 1980s. 6/ Out-migration reached a peak in 1981 with an annual outflow of nearly 170,000 workers. Since then there has been a significant decline and the outflow in 1985 was slightly less than half the number of emigrants in 1981. Indeed, there is now a net annual return migration which has important implications for the urban labor market.

2.08 The 1981 census provides data on the age-sex distribution of the population, information critical to policy planners in the social sectors and the labor market. (Table 2.3) The age structure of Pakistan's population is typical of low income countries with high population growth rates, high fertility, moderately high mortality and low life expectancy. The population is concentrated in the young age cohorts with 18% in the under 5 age group, almost 45% aged under 15 years, and only 4% aged over 64 years. Sex ratios in Pakistan are high, with 111 males reported for every 100 females. This apparent excess of males, which is probably diminishing over time, comes from poor counting of females and from higher female mortality, a common feature in South Asia. (See para 2.31.)

Current Fertility Patterns and Recent Trends

2.09 Of the two major forces driving population growth (fertility and mortality), fertility is the more important. While mortality has declined somewhat in the past 20 years, there has been no significant decline in fertility. Together, these two factors, persistently high fertility and declining mortality, are responsible for Pakistan's high rate of population growth and for its youthful age structure.

2.10 Arising from the central role of fertility are a multitude of studies and surveys. Since 1962 no fewer than nineteen sample surveys (including two censuses) have attempted to measure the country's

6/ Gillani, I. et al (1981), "Labour Migration from Pakistan to the Middle East and its Impact on the Domestic Economy," PIDE, Islamabad.

TABLE 2.3: AGE-SEX DISTRIBUTION OF THE 1981 CENSUS GRADUATED FIGURES ^{1/}
(percent)

| Ages | Graduated | | | Sex Ratio |
|-------|--------------|--------------|--------------|-----------|
| | Male | Females | Total | |
| 0-4 | 17.9 | 18.6 | 18.2 | 106.6 |
| 5-9 | 14.4 | 14.2 | 14.3 | 111.9 |
| 10-14 | 12.1 | 11.9 | 12.0 | 112.4 |
| 0-14 | 44.4 | 44.7 | 44.5 | |
| 15-19 | 9.2 | 10.1 | 9.6 | 101.1 |
| 20-24 | 7.9 | 8.5 | 8.2 | 102.5 |
| 25-29 | 6.8 | 7.2 | 7.0 | 104.9 |
| 30-34 | 5.9 | 6.0 | 5.9 | 108.0 |
| 35-39 | 5.1 | 5.1 | 5.1 | 111.5 |
| 40-44 | 4.4 | 4.3 | 4.4 | 114.7 |
| 45-49 | 3.8 | 3.6 | 3.7 | 117.7 |
| 50-54 | 3.2 | 3.0 | 3.1 | 120.7 |
| 55-59 | 2.7 | 2.4 | 2.6 | 122.9 |
| 60-64 | 2.2 | 1.9 | 2.1 | 125.1 |
| 15-64 | 51.2 | 51.9 | 51.5 | |
| 65-69 | 1.7 | 1.4 | 1.6 | 130.1 |
| 70-74 | 1.2 | 1.0 | 1.1 | 135.4 |
| 75+ | 1.5 | 1.0 | 1.3 | 150.0 |
| 64+ | 4.4 | 3.4 | 4.0 | |
| | 100 | 100 | 100 | |
| | (43,089,811) | (38,965,286) | (82,055,097) | 110.6 |

^{1/} The graduated age distribution was obtained by fitting a stable population model, after regrouping conventional age-groups to overcome the problem of age heaping on certain preferred digits, particularly 0's and 5's. Logits of reported and stable populations are plotted against one another and after the exclusion of "deviant" points, a regression line was fitted which represented the logits of the graduated age distribution.

demographic parameters such as Total Fertility Rate (TFR). 7/ Summary details of these surveys and the estimated TFRs are presented in Table 2.4. (A more detailed discussion of the surveys can be found at Annex 2.) While these surveys reveal no consistent trend in fertility levels they demonstrate the lack of any general downward trend in fertility. At the upper limit, the Pakistan Fertility Surveys (PFS) of 1960-65 and 1965-70 and the Population, Labour Force and Migration Survey (PLM) of 1970-75 all claimed a TFR in excess of seven. At the lower limit, the Household Economic and Demographic Survey (HED) of 1972-73 claimed a TFR of less than five.

2.11 Surveys that asked about birth histories all showed pronounced fertility drops during the period immediately preceding the survey. However, when checked against other surveys it appears that periods of low fertility shown by one survey coincide with high fertility periods in the next, strongly suggesting that these falls were spurious. 8/ The two most recent surveys, the Pakistan Contraceptive Prevalence Survey (PCPS) and the Pakistan Demographic Survey record TFRs of 5.95 and 6.97 respectively. The PCPS, however, has to be discounted as a reliable fertility estimate for the same reason that has plagued other surveys that use birth histories--underreporting of births in the period immediately preceding the survey (thought, in this instance, to be as much as 20 percent).

2.12 While demographers are unsure of trends in current and past fertility levels in Pakistan, most believe that there has been no appreciable decline in the overall fertility rate, in particular, the marital fertility rate. But two aspects of fertility show signs of change: age-specific fertility rates show fewer births to young women (Annex 2, Table 2); and urban fertility rates are somewhat lower than rural fertility rates. Recent data show lower fertility rates in the 15-19 age group and generally among women under 35. On the other hand, fertility rates for women 35 and over have risen, while peak fertility levels remain in the age group 20-29. These apparent changes in age-specific fertility rates are due to rising marriage ages. However, because of declining length of breastfeeding married women are ex-

7/ The TFR is the average number of children born to a woman who lives to the age of 50 and who goes through life having children at the current rate.

8/ Similar patterns emerge when fertility trends are reconstructed by means of the "own children" method from the age distributions of living children enumerated in the HED and the 1981 census: in each case, the overstatement of ages of young children imply a dramatic fall in fertility during the five years before the survey or census. Retherford R. et al. (1987), "Fertility Trends in Pakistan - The Decline That Wasn't," Asian Pacific Population Forum, Vol. 1, No. 2.

TABLE 2.4: DIRECT ESTIMATES OF THE TOTAL FERTILITY RATE FROM VARIOUS SURVEYS

| SURVEY | PERIOD | ESTIMATED TFR |
|---|---------------|----------------------|
| Population Growth Estimation (PGE) | 1962-65 | 7.00 |
| National Impact Survey (NIS) | 1960-61 | 6.40 |
| | 1962-63 | 6.28 |
| | 1964-65 | 6.27 |
| | 1966-67 | 5.02 |
| Population Growth Survey (PGS) | 1968-71 | 6.04 |
| | 1976-79 | 6.90 |
| Household Economic and Demographic Survey (HED) | 1972-73 | 3.71 |
| Pakistan Fertility Survey (PFS) | 1960-65 | 7.13 |
| | 1965-70 | 7.07 |
| | 1970-75 | 6.28 |
| Population, Labour Force and Migration Survey (PLM) | 1965-70 | 6.80 |
| | 1970-75 | 7.10 |
| | 1975-80 | 6.50 |
| Census 1981 | 1980-81 | 6.50 |
| Pakistan Contraceptive Prevalence Survey (PCPS) | 1983-84 | 5.95 |
| Pakistan Demographic Survey (PDS) | 1984-85 | 6.97 |

periencing shorter birth intervals, thus keeping total marital fertility rates largely unchanged.

2.13 Since 1975 total fertility rates in Pakistan's urban areas have fallen below those in rural areas (Annex 2, Table 3). Total fertility is lowest in major urban areas (5.5), although small cities have rates similar to rural areas (6.1 and 6.2 respectively: PCPS, 1984). 9/ This finding hints at future demographic change in big cities like Lahore and Karachi where lifestyles have been transformed in the last two decades. At the same time, recent migrants who have retained rural lifestyles form the population base of many smaller urban centers.

2.14 The Direct Determinants of Fertility are (i) incidence and age at marriage, (ii) breastfeeding, (iii) use of contraceptives, and (iv) a group of lesser variables that include abortion, coital frequency and spousal separation. While increasing age at marriage, greater use of contraceptives, abortion and spousal separation all work to suppress fertility, a fall in breastfeeding incidence and duration increase it. As each of these variables has changed in recent years in Pakistan, their impact on fertility has been modified. Since reliable Pakistan data are available only for age at marriage, breastfeeding and contraceptive use, these variables form the focus of the discussion.

2.15 One notable change in Pakistan's past demography is rising female marriage ages, a trend noted most distinctly between 1961 and 1972 but one that continued to the 1981 census. As shown in Table 2.5, the average age at marriage for females is high by developing country norms, having risen by over two years (from 18.1 to 20.4) and for males by about one and a quarter years (from 23.8 to 25.1) during the two decades 1961-81. In 1981 less than 30% of females aged 15-19 were married compared to over 50% twenty years earlier. The relatively smaller change in male marriage age has narrowed the average age gap between partners.

2.16 A recent study revealed that the highest average marriage ages for both men and women were associated with residence in big cities like Lahore and Karachi. 10/ For men the average was 26.3 years in 1981, for women 21.6 years. After this marriage ages were highest in the provincial towns of Punjab, Sind and NWFP (averages 25.2 years and 20.8 years for men and women respectively), followed by rural areas, (24.8 years and 19.8 years). Baluchistan generally records the lowest

9/ On the other hand, urban areas typically have higher marital fertility rates, the result of shorter length of breastfeeding and breakdown of postpartum taboos which increase marital fertility in the absence of increased contraceptive use. (Para 2.17)

10/ Sathar, Z. and F. Kiani (1986) "Delayed Marriages in Pakistan" Pakistan Development Review, Vol. 25, No. 4.

TABLE 2.5: PROPORTIONS OF FEMALES AND MALES SINGLE BY CURRENT AGE FOR 1961, 1972 AND 1981 CENSUSES

| | Current Age Groups | | | | | | | Average Age at Marriage |
|----------------|--------------------|-------|-------|-------|-------|-------|-------|-------------------------------|
| | 15-19 | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 | |
| FEMALES | | | | | | | | |
| 1961 | 46.6 | 12.0 | 5.1 | 3.0 | 2.7 | 2.2 | 2.0 | 18.1 |
| 1972 | 65.6 | 21.3 | 7.2 | 3.6 | 2.1 | 2.0 | 1.5 | 19.7 |
| 1981 | 70.4 | 26.5 | 8.7 | 3.9 | 1.7 | 1.6 | 1.0 | 20.4 |
| MALES | | | | | | | | |
| 1961 | 83.7 | 52.9 | 27.9 | 14.2 | 8.8 | 6.4 | 5.1 | 23.8 |
| 1972 | 92.6 | 67.8 | 36.0 | 17.4 | 9.2 | 6.4 | 4.3 | 25.7 |
| 1981 | 92.5 | 64.6 | 31.3 | 13.9 | 6.2 | 4.4 | 2.5 | 25.1 |

age at marriage for both men and women. Age at marriage is found to be positively related to education levels and working status. 11/

2.17 Changes in breastfeeding behavior are notable during the past decade. During 1975-79, years for which survey data are available, the average reported length of breastfeeding declined by 2.6 months while the proportion of women who ever breastfed declined only marginally from 95% to 94%. Table 2.6 shows the mean length of breastfeeding by province and urban/rural residence for these two survey years. Both rural and urban women show declines in length of breastfeeding, although the fall in the mean length of breastfeeding is more sharp among urban women (3.4 months compared to 2.4 months). Without compensatory contraceptive use, declines in breastfeeding are likely to increase fertility levels by reducing the postpartum amenorrhea period. 12/ Analysis of breastfeeding behavior by four variables (mother's age, sex of child, place of residence, and level of parental education) shows that educated women breastfeed for shorter durations, and that older, rural mothers are more likely to breastfeed than younger, urban ones.

2.18 Past trends in contraceptive use in Pakistan show consistently low levels of use. Surveys conducted between 1968 and 1979 found current contraceptive usage rates of 5.5%, 5.2% and 3.3% among married women. The most recent survey, PCPS (1984) suggests some progress since 1980 with 9.1% of currently married women aged 15-49 admitting to using some contraceptive method (with an estimated additional 5% "shy users"). This survey also suggests that users are employing more reliable forms of modern contraception than in the past. 13/ Women living in big cities have the highest levels of contraceptive use (30 percent) compared to 11 percent in smaller urban and 5 percent in rural areas, respectively. Contraceptive use increases with women's education, larger numbers of children and with women's ages.

2.19 The PCPS affords a revealing look at desired fertility and intentions of future contraceptive use which can be correlated with a range of household characteristics (Annex 2, Table 4). The data show a relatively high average desired family size of 4.9 children but one that is well below actual current fertility outcomes. Desired family size varies with mothers' age (older women apparently desire more children

11/ Sathar, Z. and Kazi, S. (1988) "Productive and Reproductive Choices of Metropolitan Women: Report of a Survey in Karachi." Friedrich Ebert Stiftung/PIDE.

12/ The decline is of less importance for baby nutritional status.

13/ 7.6 percent of currently married women are using efficient methods compared to half that proportion in the 1970s.

TABLE 2.6: PERCENTAGE OF CHILDREN BREAST-FED AND MEAN DURATION OF BREAST-FEEDING^{1/} FOR CHILDREN BORN IN THE 2 YEARS BEFORE THE SURVEY (N), PFS and PLM

| | PFS (1975) | | | PLM (1979) | | |
|--------|-----------------|----------------------|------|-----------------|----------------------|------|
| | % breast-fed | Duration (months) | N | % breast-fed | Duration (months) | N |
| All | 95 | 17.2 | 2254 | 94 | 14.6 | 4405 |
| Urban | 92 | 15.2 | 609 | 92 | 11.8 | 1196 |
| Rural | 96 | 17.9 | 1646 | 95 | 15.5 | 3209 |
| Punjab | 94 | 17.3 | 1478 | 94 | 15.8 | 2809 |
| Sind | 96 | 16.7 | 518 | 93 | 11.9 | 997 |
| NWFP | 95 | 17.7 | 211 | 94 | 15.4 | 466 |

^{1/} Estimated as: $\frac{\text{no. of children being breast-fed at time of survey}}{\text{average no. of births per month}}$

Figures for Baluchistan not shown separately because of small numbers but are included in estimation for total sample.

Source: Shah, I et. al. (1986), "Fertility in Pakistan during the 1970's," Journal of Biosocial Sciences, Vol. 18, Table 9.

than younger women, although this may be an ex post justification of actual fertility outcomes), education (more educated women wanting fewer children), number of living children (the greater the number of living children the higher the desired family size) and place of residence (little variation between rural and urban but NWFP and Baluchistan have notably higher desired family sizes).

2.20 Although awareness of modern contraceptive methods has risen sharply from 26.3 percent among currently married women in 1979 to 61.5 percent in 1984, contraceptive use has not increased much. 14/ Knowledge of modern contraceptive methods increases with residence in big cities and with education, an indication that the population program has made some headway in disseminating information. However, inter alia, supply constraints (both coverage and the availability of alternative types of contraception), fear of side effects and family resistance still exist as barriers to increased contraceptive use.

2.21 Data on other direct determinants of fertility are not available in Pakistan. The separation of close to 2 million couples due to male migration to the Middle East may have decreased fertility in recent years but hardly any evidence exists that this is so. Induced (illegal) abortion, another important fertility determinant in situations that have low contraceptive usage, may be rising in urban areas, but reliable estimates are difficult to come by.

2.22 The extent to which changes in fertility determinants suppress or enhance fertility is critical to an understanding of both past and future fertility rates. The evidence cited above shows rising marriage age and slowing increasing contraceptive use, both of which depress total fertility. But those who marry later apparently tend to reduce the time between births. This is partly due to the decline in the length of breastfeeding which is not fully counteracted by increased contraceptive use.

2.23 To better understand and to quantify the relative effect of each of these variables on past fertility trends a special demographic model can be applied to survey data (the Bongaarts framework). Beginning with a total natural fertility rate (here assumed to be 14.5) and using data from two demographic surveys (PFS, 1975 and PCPS, 1984) the fertility reductive effect of each of the three variables is measured. The results are as follows:

14/ The oral pill is the most widely known method of contraceptive followed by female sterilization, IUDs and injections.

| | <u>PFS(1975)</u> | <u>PCPS(1984)</u> |
|---|------------------|-------------------|
| Total natural fertility rate (births) | 14.5 | 14.5 |
| <u>Reductive effect of:</u> | | |
| Proportions married | - 2.8 | - 3.5 |
| Contraception | - 0.4 | - 0.7 |
| Breastfeeding | - 3.8 | - 3.0 |
| <u>Resultant total fertility rate</u> | 7.5 | 7.3 |
| <u>Actual observed total fertility rate</u> 15/ | 6.3 | 6.0 |

2.24 These results (for Pakistan) are typical of developing countries in early stages of fertility decline: breastfeeding and rising age at marriage account for the bulk of foregone fertility, while contraception accounts for very little. The inter-temporal changes in fertility reduction associated with the three variables also reflect trends observed in other developing countries. Of the three reductive variables, breastfeeding had the strongest effect in the PFS but had declined somewhat in the PCPS when the proportion married (or average age at marriage) had the strongest effect. Between the two surveys, the fertility diminishing effect of increased age at marriage was counteracted by shorter periods of breastfeeding. The apparent (small) fall in total fertility between the two surveys was therefore entirely due to the increased importance of contraception. However small the effect of this variable in absolute terms, its impact on total fertility between 1975 and 1984 was nonetheless important. This importance is essentially bound to escalate in the future.

Prospects for Fertility Decline

2.25 Identifying groups of women likely to adopt new fertility norms and establish new patterns of reproductive behavior is essential for future declines in the fertility rate. The above discussion of past fertility trends and differentials is not very encouraging in that it failed to identify any significantly less fertile group that will lead Pakistan further into the so-called fertility transition. 16/ Evidence

15/ The discrepancy of over one birth in the total fertility rate between the model and those recorded in the surveys is due to either the effect of abortion and spousal separation which is not assessed in the model, and/or omissions in reported births in the survey data. In the case of the PCPS the latter explanation is thought to predominate.

16/ The exception are those small numbers of women who live in the principal metropolitan areas, who have secondary and higher levels of education, and who are employed in formal sector, high status jobs.

from other countries suggests that the process by which fertility falls is a complex set of interactions between the direct determinants of fertility (age at marriage, breastfeeding, contraception), which themselves change in importance over time, and socioeconomic factors that influence these direct determinants (such as income, education, female employment, morbidity and mortality, urban residence). The above discussion has shown that each of the principal direct determinants of fertility has undergone change in Pakistan's recent past, a reflection of changing socioeconomic circumstances and attitudes, but the overall effect on fertility has been, at best, very modest. This is because the fertility fall associated with rising average marriage age has been largely cancelled by shorter periods of breastfeeding. At the same time, the reductive effect of contraception on fertility has been very modest.

2.26 Experience from other countries also suggests that beyond an initial reduction in fertility associated with breastfeeding practice and delayed marriage, the bulk of fertility reduction (that is, about 70%) has to come from increased contraception. Continued rising age at marriage further depresses fertility but this is usually negated by reduced length of breastfeeding--the precise experience of Pakistan in the past decade. At the same time, the average age at marriage for women in Pakistan is already around 20 years--a high figure by South Asian and Muslim standards. Further increases in age at marriage are therefore likely only when secondary and higher education encompasses a large part of the female population and when formal sector employment opportunities for women improve. The future of Pakistan's fertility level seems to rest squarely with the rate of contraceptive use. This suggests, inter alia, a very active family planning campaign as well as increased education and job opportunities for women.

Recent Trends in Mortality

2.27 Mortality is quite high in Pakistan relative to other South Asian countries but there has been some progress in recent years. From a rate of 21 (per thousand) in 1965, most recent estimates put the crude death rate at about 14. Life expectancy at birth in 1986 was estimated at rather low figures: 55 years for males and 54 years for females, but up from 46 years and 44 years in 1965. The age-specific death rate curve for Pakistan has a shape that is typical of most high-fertility countries: mortality is high in the under-5 age group; moderately low between the ages of 5 and 50 years, but after the age of 50 it rises steeply. Age-specific mortality is higher for females between the ages of 10 and 45 years, a phenomenon that is associated with child bearing. (See para. 2.31)

2.28 Infant and Child Mortality As with fertility estimates, a large number of direct estimates of infant and child mortality, derived from sample surveys and censuses, present a bewildering range of estimates. Table 2.7 documents these estimates for the period 1961 to 1986. In general the data show a sharp decline in both infant and child

TABLE 2.7: ESTIMATES OF MORTALITY IN FIRST FIVE YEARS OF LIFE FROM VARIOUS SOURCES 1961-1985:

| Source of Estimate | Nature of Estimate | Period | Infant Mortality Rate | Mortality Under 5 |
|---|--------------------|---------|-----------------------|-------------------|
| Population Growth Estimation Experiment (PGE) | | 1962-65 | 143 | 180 |
| | | | 128 | 248 |
| Household, Economic & Demographic Survey (HED) 1973 | INDIRECT | 1967-71 | - | 167 |
| Population Growth Survey (PGS) 1971 | INDIRECT | 1967-69 | 109 | 209 |
| Pakistan Fertility Survey (PFS) 1975 | DIRECT | 1961-65 | 142 | 228 |
| | | 1966-70 | 136 | 200 |
| | | 1971-75 | 139 | 207 |
| Population, Labor Force & Migration Survey (PLM) 1980 | DIRECT | 1965-69 | 116 | 169 |
| | | 1970-74 | 113 | 164 |
| | | 1975-79 | 125 | 160 |
| Population Growth Survey (PGS) 1976-79 | DIRECT | 1976 | 87 | 137 |
| | | 1977 | 100 | 144 |
| | | 1978 | 95 | 126 |
| | | 1979 | 95 | - |
| Census 1981 | INDIRECT | 1976-79 | - | 193 |
| Contraceptive Prevalence Survey (PCPS) 1984-85 | DIRECT | 1983-84 | 106 | - |
| | INDIRECT | 1979-83 | - | 178 |
| Pakistan Demographic Surveys (PDS) 1984-86 | DIRECT | | 116 | - |

mortality through the 1960's and a more gradual rate of decline thereafter. The most recent survey estimate, the PDS (1986), recorded an infant mortality rate of 116. 17/ The bulk (about 60%) of infant deaths occur in the neonatal period (the first 28 days of life), the result of poor maternal health, delivery complications and tetanus. Infant deaths occurring in the first year of life are largely due to diarrhea and common infectious diseases (such as whooping cough, tuberculosis and tetanus), while childhood deaths are often the result of malnutrition or poor weaning practices. Infant and child mortality show marked gender differentials: the typical pattern of higher neonatal mortality for boys is followed by the reverse pattern in postneonatal and childhood.

2.29 The major demographic correlates of infant and child mortality are mother's age at the time of birth, birth order, child gender, and length of birth spacing (Annex 2, Table 5). Of these, mother's age at the time of birth and birth spacing are most important. Children born to young mothers (under 20 years) have high death rates, as do children born less than two years after the previous child. Socio-economic variables such as income, education and place of residence are also important determinants of infant and child mortality. In particular, maternal education, even minimal schooling, reduces infant mortality. Urban residence is also associated with lower infant mortality. However, the effects of birth spacing on child survival dominate all these socio-economic variables. (See Chapter 3)

2.30 Adult Mortality. Data on adult mortality are very poor in Pakistan. In the absence of any vital registration data, censuses and sample surveys are the only data sources. These show a steady decline in the crude death rate and an increase in life expectancy. Causes of death are much the same as in any other low income country and largely associated with infectious diseases, the result of poor water and sanitation and an unbalanced diet. Malaria and respiratory illnesses are also common health problems and causes of death.

2.31 Gender Bias in Mortality. Pakistan shares the South Asian pattern of lower survival rates for female children and higher mortality for women, particularly those aged between 20 and 45. First identified in the 1921 census, higher female mortality has persisted, albeit on a declining basis, through the 1981 Census.18/ Age patterns of mortality continue to be quite different for men and women. Of particular interest to this report is the higher incidence of death among women during their child bearing years, a fact which is undoubtedly related to the high rates of fertility in Pakistan. Reliable maternal mortality estimates are unavailable for Pakistan, but microdata from Lahore Hospital

17/ Current government estimates suggest a figure in the region of 90-100.

18/ The 1981 Census recorded a sex ratio of 111.

estimate a maternal mortality rate of between 6 and 8 per 1,000 births. 19/

Prospects for Further Mortality Decline

2.32 Although not as critical as fertility in determining the rate of population growth, future trends in mortality are important in determining the size and distribution of Pakistan's population. Of particular importance are prospects for future infant and child mortality since they account for the bulk of total deaths. Also, while serving to keep population growth in check, the current fairly high infant and child mortality rates are a factor working against a fertility decline. This is because parents, knowing the risks associated with child survival, tend to have more births than the desired number of surviving children. Moreover, the death of a child shortens the period when a woman is unlikely to fall pregnant. Only at such time as infant and child survival become more dependable will parents move to control the supply of "replacement births." 20/

2.33 Prospects for a continuing decline in infant and child mortality are reasonably good. For example, the Accelerated Health Program, launched in 1983, is specifically designed to reduce infant and child mortality and morbidity by immunizing all children under 5 years against the six most common infectious diseases (that is, whooping cough, measles, diphtheria, polio, tetanus and TB), and immunizing pregnant women against tetanus. Combating diseases that cause diarrhea, another major cause of infant death, through oral rehydration therapy, and the training of traditional birth attendants are two other important programs. Achievements to date in these areas are impressive: about 75 percent of children aged 0-5 years have been fully immunized and 25 percent of expectant mothers vaccinated with tetanus toxoid; 20,000 traditional birth attendants have been trained; and about 29 million packets of oral rehydration salts distributed. No study fully evaluates the impact of these interventions on infant and child mortality but

19/ Data for Bangladesh show convincingly the effect of high parity and maternal age on maternal mortality. The risk of dying associated with child birth is more than twice as high among women with parity of 5 or more compared with lower parity. When age and parity are combined, substantially higher risk of death emerges for older, higher parity women than for other women.

20/ The relationship also works the other way. Fewer births and longer time intervals between births also affect the infant mortality rate. See Barnum, H. (1988) "Interaction of Infant Mortality and Fertility and the Effectiveness of Health and Family Planning Programs". World Bank Working Papers No. WPS 65, July.

evidence from other countries implies that further declines in mortality levels are likely.

2.34 The course of mortality decline above age five is harder to predict, mainly because of the lack of reliable data on cause of death. Much can be done to curtail the incidence of infectious and parasitic diseases (including malaria) that cause a large proportion of deaths, particularly in rural areas. In this regard, GOP is taking measures to improve coverage of clean water and improve sanitation facilities in both rural and urban areas. A critical component in lowering mortality among women of child bearing age is maternal and child health care (MCH), specifically the availability of integrated family planning/MCH services throughout all health facilities.

Population Projections

2.35 The wide array of estimates of current levels of fertility and mortality makes the task of projecting the future population unusually complex. The population projections derived for purposes of this report are specific to the requirements of the analyses that follow in subsequent chapters. In this sense they are illustrative projections and they are not intended to be used in other situations. Nevertheless, on the basis of available estimates, a "base year" position has been developed (see Table 2.8) that is broadly consistent with the age-sex structure of the present population and the official contraceptive usage rate (9%). The age/sex structure of the base year population is that derived from the 1981 Census (Table 2.3) and projected to 1985 at the same growth rate as that observed in the 1972-1981 intercensal period. From this starting point (effectively 1985) population projections have been made. 21/ Both "high" and "low" population projections broadly follow the World Bank's standard methodology for projecting population. 22/ For the low projection, the methodology establishes for Pakistan a net reproduction rate (NRR) of unity in the year 2030. For the high projection, the year 2050 is established as the point at which NRR becomes unity. 23/ Both projection scenarios use the same infant

21/ The two scenarios -- labeled "high" and "low" -- are described in more detail below and these form the basis of much of the analysis in subsequent chapters of the report.

22/ Zachariah, K.C. and Vu, My T. (1987) "Europe, Middle East, and North Africa Region Population Projections 1987-88," The World Bank. PHN Technical Note 87-19c, pp. 1-14.

23/ The TFR in the year when NRR = 1 is then estimated on the basis of the mortality level in that year.

TABLE 2.8: DEMOGRAPHIC ASSUMPTIONS BEHIND POPULATIONS PROJECTIONS AND IMPLIED VITAL RATES, 1985 - 2030 1/

| | More rapid fertility decline (NRR = 1 in 2030) | | | | | | Less rapid fertility decline (NRR = 1 in 2050) | | | | | |
|-----------|---|---------------|-----------------------------------|--------|--------|--|---|---------------|-----------------------------------|--------|--------|--|
| | Birth Rate | Death Rate | Rate of Natural Increase(%) | TFR | IMR | Implied Contraceptive Usage Rate (%) | Birth Rate | Death Rate | Rate of Natural Increase(%) | TFR | IMR | Implied Contraceptive Usage Rate (%) |
| BASE YEAR | 44.7 /2 | 13.8 /2 | 3.10 /2 | 6.5 /2 | 100 /2 | 9 /2 | 44.7 /2 | 13.8 /2 | 3.10 /3 | 6.5 /2 | 100 /2 | 9 /2 |
| 1986-1990 | 39.6 | 12.6 | 2.70 | 5.9 | 90 | 17 | 43.3 | 12.9 | 3.03 | 6.5 | 90 | 10 |
| 1991-1995 | 36.1 | 10.9 | 2.51 | 5.2 | 81 | 28 | 42.3 | 11.4 | 3.09 | 6.3 | 81 | 12 |
| 1996-2000 | 33.5 | 9.7 | 2.38 | 4.6 | 72 | 37 | 40.2 | 10.0 | 3.02 | 5.9 | 72 | 17 |
| 2001-2005 | 31.5 | 8.7 | 2.29 | 4.1 | 63 | 45 | 38.5 | 8.8 | 2.97 | 5.5 | 63 | 23 |
| 2006-2010 | 29.4 | 7.8 | 2.16 | 3.6 | 55 | 53 | 36.7 | 7.7 | 2.89 | 5.1 | 55 | 29 |
| 2011-2015 | 26.8 | 7.1 | 1.97 | 3.2 | 47 | 59 | 34.2 | 6.8 | 2.74 | 4.5 | 47 | 38 |
| 2016-2020 | 23.9 | 6.5 | 1.73 | 2.8 | 40 | 65 | 31.1 | 6.0 | 2.50 | 4.0 | 40 | 46 |
| 2021-2025 | 21.1 | 6.2 | 1.49 | 2.5 | 34 | 69 | 28.2 | 5.5 | 2.27 | 3.5 | 34 | 54 |
| 2026-2030 | 18.7 | 6.1 | 1.27 | 2.2 | 28 | 74 | 26.3 | 5.1 | 2.12 | 3.2 | 28 | 59 |

1/ Fuller details can be seen in Annex 1, Table 3.

2/ 1985 figures.

3/ 1981-1985 (estimated).

mortality and migration assumptions. 24/ Although somewhat unrealistic (a more rapid decline in fertility should be associated with a lower infant mortality rate), this approach has the advantage of showing the effect of different fertility rates.

2.36 The low projection assumes that fertility has already begun to decline (TFR = 5.9 between 1986-90) and continues to decline quite rapidly (exponentially). This assumption implies a strong and very rapidly expanding family planning program, designed to increase the use of modern contraception since the scope for any gains in fertility reduction from other direct determinants (age at marriage and breast-feeding) are thought to be weak. Contraceptive usage is projected to increase to 37% by the year 2000; beyond 2000, the contraceptive usage rates are higher than the current percentage of women who say that they want no more children (PCPS). The assumption is that by 2000, economic development in general and increased education of women in particular will substantially increase the percentage of women wanting fewer children. At the same time, the supply of family planning services should have improved dramatically. Nonetheless, this low population projection should be considered very optimistic, given the specific past experience of Pakistan and other developing countries in achieving a rapid decline in fertility through increased contraceptive usage. 25/

2.37 The high population projection assumes that the levels of fertility remains fairly stable for the next few years, then begin to decline slowly as the turn of the century approaches. After 2000, the pace of decline accelerates such that a NRR of unity is reached by 2050. Increased contraceptive use is once again assumed to be the direct source of fertility decline and implied contraceptive usage rates lag those of the low scenario by over 10 years. (Table 2.8.) This scenario is more realistic about increased contraceptive usage, given the present slow progress in the family planning and among those socioeconomic variables thought to influence demand for fertility control. 26/

2.38 The population projections from these two scenarios are

24/ Net migration is assumed to be zero in the year 2000. Infant mortality rates are given in Table 2.8.

25/ It is estimated that between 1990 and 1995 an additional 3 million married women would have to become contraceptive users. This is double the current number of users.

26/ Even here it is necessary that the contraceptive usage rate continues to increase and reaches 19% by the year 2000. This implies recruiting an additional 1.5 million married women into the program by 1995.

2.38 The population projections from these two scenarios are presented in Table 2.9. (More detailed projections are in Annex 1.) Starting with a 1985 population of 96.2 million, the high growth projection (that is, with a slower, more realistic rate of decline in fertility) results in a population of 150 million in 2000 and almost 300 million in 2050. The implied growth rate of the population until the year 2000 is a little different from that recorded in the 1972-1981 inter-censal period, but after the turn of the century it falls to 2.9% in 2010 and 2.3% in 2025. These relatively high population growth rates produce a population pyramid broad at the base - 45% of the population under 15 years of age until 2000 - and narrow at the top. This age structure has important implications for the ratio of productive to non-productive population (the dependency ratio), and for health and education services. 27/ In later years, as these young people start looking for work, the ratio of young, relatively inexperienced workers to older, experienced workers affects the labor market. 28/ In these outer years, the shape of the pyramid affects future population growth because today's young girls are tomorrow's mothers. In the year 2010, for example, there will be 47 million women of childbearing age compared to 20 million in 1985.

2.39 A more active population policy and a vigorous family planning program could moderate Pakistan's rate of population growth. This would reduce the size of the population, narrow the base of the population pyramid and reduce the momentum of future population growth as the following key statistics illustrate:

| | Rate of fertility decline | |
|--|---------------------------|-------------------|
| | <u>less rapid</u> | <u>more rapid</u> |
| <u>Size of Population (millions)</u> | | |
| 2000 | 151.3 | 140.0 |
| 2010 | 202.9 | 174.9 |
| 2025 | 295.4 | 226.7 |
| <u>Distribution of Population:</u> | | |
| <u>% Under 15 years</u> | | |
| 2000 | 44.8 | 40.3 |
| 2010 | 42.6 | 36.6 |
| 2025 | 37.0 | 30.0 |

27/ The TFR in the year when NRR = 1 is then estimated on the basis of the mortality level in that year.

28/ Chapter 5 of this report.

TABLE 2.9: POPULATION PROJECTIONS, 1985-2030 1/

| | <u>Rapid Fertility Decline (= Low)</u> | | | | <u>Less Rapid Fertility Decline (= High)</u> | | | | Low and High Scenarios: Sex Ratios |
|------|--|----------------------|-------|-----|--|----------------------|-------|-----|--|
| | Total Population (millions) | Age Distribution (%) | | | Total Population (millions) | Age Distribution (%) | | | |
| | | 0-14 | 15-64 | 65+ | | 0-14 | 15-64 | 65+ | |
| 1985 | 96,180 | 44.5 | 51.6 | 3.9 | 96,180 | 44.5 | 51.6 | 3.9 | 110 |
| 1990 | 109,784 | 44.4 | 52.0 | 3.7 | 111,638 | 45.3 | 51.1 | 3.6 | 108 |
| 1995 | 124,321 | 43.1 | 53.4 | 3.6 | 130,115 | 45.6 | 51.0 | 3.4 | 107 |
| 2000 | 140,001 | 40.3 | 56.1 | 3.5 | 151,293 | 44.8 | 52.0 | 3.3 | 106 |
| 2005 | 156,971 | 38.3 | 58.1 | 3.6 | 175,556 | 43.8 | 52.0 | 3.3 | 105 |
| 2010 | 174,906 | 36.6 | 60.0 | 3.7 | 202,882 | 42.6 | 54.2 | 3.2 | 105 |
| 2015 | 192,992 | 34.8 | 61.2 | 3.9 | 232,664 | 41.2 | 55.5 | 3.3 | 104 |
| 2020 | 210,442 | 32.6 | 63.2 | 4.2 | 263,654 | 39.3 | 57.3 | 3.4 | 104 |
| 2025 | 226,734 | 30.0 | 65.3 | 4.7 | 295,409 | 37.0 | 59.4 | 3.6 | 103 |
| 2030 | 241,570 | 27.4 | 67.5 | 5.1 | 328,433 | 34.7 | 61.5 | 3.8 | 103 |

1/ These population projections have been derived for purposes of this report. Under no circumstances should they be considered the accurate estimates for Pakistan. More detailed projections can be seen in Annex 1.

Number of Women of Child
Bearing Age (millions, 15-49 years)

| | | |
|------|------|------|
| 2000 | 32.9 | 32.9 |
| 2010 | 46.6 | 43.9 |
| 2025 | 74.6 | 61.2 |

The variation between the high and low rates of population growth are quite apparent, especially in the outer years. But even by the year 2000 differences in population size (11 million people) and structure (4.5% fewer in the under 15 age group) are important for the country and its people. These form the subject matter of the next four chapters of this report.

CHAPTER 3

HOUSEHOLD CONSEQUENCES OF HIGH FERTILITY

Introduction

3.01 Examining the 'consequences' of Pakistan's high fertility for families is important for several reasons. First it helps explain costs and benefits of high fertility to individual families. Children have important emotional, social, and economic value--they represent additional labor and provide security to parents in their old age. Yet high fertility--a large number of closely spaced births--affects many aspects of a family's well-being, especially maternal, infant and child health as well as children's schooling, household labor supply and domestic savings. The second reason for examining 'consequences' at the household level is to understand the implications of high fertility for the macro economy. Household savings decisions affect national savings. Household fertility and schooling decisions affect public expenditures for education and thus public savings. Human capital accumulation and labor markets are also affected. Third, with a better understanding of the costs and benefits of high fertility at the household level, policy and program design and implementation can be more effective.

3.02 This chapter reviews the existing evidence on selected household economic consequences of high fertility in developing countries, with special reference to Pakistan. Documenting these consequences is difficult for both conceptual and empirical reasons. In fact, no simple one-way causal relationship exists between household fertility, household characteristics, behavior and outcomes. These decisions are often jointly determined and imbedded in cultural and religious traditions which vary from country to country. Thus, modeling these relationships and interpreting the results is difficult.

3.03 This chapter addresses the following consequences of fertility for the household: (i) the impact on the survival and health of mothers and children; (ii) on children's school attendance; (iii) on family labor supply and income; and (iv) on household savings.

The Health Consequences of High Fertility

3.04 High fertility has serious effects on the survival and health of mothers and children. As indicated in Chapter 2, several aspects of fertility behavior are known to be detrimental. Close spacing of births and childbirth at the extremes of childbearing age (under 20 and over 35) have negative consequences on infant and child mortality worldwide. High parity and giving birth at the extremes of childbearing age also increase maternal mortality and morbidity. The relationship between high fertility and health of mothers and children is less clearly documented, but the evidence points to a similarly negative relationship.

3.05 Impact on Mortality. The effects of high fertility on infant and child mortality have been well documented for developing countries and for Pakistan specifically. Table 3.1 summarizes the findings. The child spacing effects are dramatic and consistent across countries. In Pakistan, children born within 2 years of a surviving child have a 30% higher chance of dying in the first month of life, a 60% higher chance of dying in the remainder of the first year, and a 50% higher chance of dying between ages of 1 and 5 than those born more than two years after a preceding child. If the sibling had died, the mortality risk of the newborn child is even higher. The mortality risk for the newborn would be higher still if two children has been born in the previous two years. Even if the spacing period is larger (2-4 years rather than 0-2), Table 3.1 shows that a newborn is still at higher risk in its first year of life if there were other births in the period than if there were none.

3.06 Birth order and mother's age also affect the newborn's survival probability. These biological factors are important in the first year of life, while environmental (social and economic) factors predominate later. In Pakistan, first born children suffer increased mortality during the first year of life, having a mortality twice as high as children further down the birth order. If they survive their first year, they then have lower mortality in ages 1-5. The reverse is likely to be true for children who are fourth-born or higher; their mortality probability is higher in their second year of life than in their first.

3.07 The disadvantage of a first-born in its first year of life is in part due to the young age of the mother. Children born to mothers under 20 have much higher mortality rates in all age groups than children of mothers aged 25-34. This is probably explained by both biological considerations, especially for mothers below the age of 18, and environmental ones, notably the young mother's lack of knowledge about infant care. Children of women over 35 are disadvantaged in ages 1 to 5, but not in the first year of life.

3.08 In Pakistan as in other countries, female infants have an initial biological advantage over male infants. However, this tendency is soon reversed. Table 3.1 shows that female children have substantially higher mortality in Pakistan after the first month of life, in contrast to female children worldwide, who retain their biological advantage for the first year of life.

3.09 Maternal mortality in Pakistan is 600 per 100,000 compared with 145 for the average middle income country, according to UNICEF data. Age-specific female mortality rates are consistently higher than male mortality rates through the childbearing years but are lower thereafter. 1/ Although data on the effects of parity (number of births) and maternal age on maternal mortality are not available for Pakistan, several studies in Bangladesh provide some insights. Two of three Bangladesh studies show that higher parity women account for a high proportion of maternal deaths. The third

1/ See para 2.31.

TABLE 3.1: PAKISTAN MORTALITY RISK (% FOR THE GROUP
COMPARED TO THAT OF THE REFERENCE GROUP)

| | No. of Births | | | | | | Birth Order | | | Mother's Age | | | Child's Sex |
|--------------------------------------|--|-------------|--------------|-------------------------|-------------|--------------|--|------|-------|---|-------|------|-----------------------|
| | Previous 0 - 2 Years | | | Previous 2 - 4 Years | | | 7 or 1st | | | 35 or More | | | Female |
| | One Alive (relative to 0-2 years) | One Dead | 2 or More | One Alive | One Dead | 2 or More | 4-6 (relative to 2-3 in birth order) | More | 1st | 20 (relative to mothers aged 25-34) | 20-24 | More | (relative to male) |
| <u>Neo-Natal (0-1 month)</u> | | | | | | | | | | | | | |
| Pakistan | +30% | +210% | +150% | 0 | + 60% | +30% | -10% | -10% | + 80% | +40% | +10% | 0 | -20% |
| South Asia | -60% | +220% | +170% | 0 | +100% | +60% | -20% | -10% | +100% | +30% | 0 | -10% | -20% |
| Worldwide | +70% | +290% | +250% | 0 | +110% | +40% | 0 | +20% | + 80% | +30% | +10% | +20% | -20% |
| <u>Post Neo-Natal (1-12 mos)</u> | | | | | | | | | | | | | |
| Pakistan | +60% | +140% | +170% | +20% | + 60% | +50% | -10% | 0 | +100% | +10% | 0 | 0 | +20% |
| South Asia | +50% | +160% | +180% | +10% | + 80% | +50% | +10% | +30% | + 50% | +30% | +10% | -10% | 0 |
| Worldwide | +90% | +240% | +240% | +10% | +110% | +60% | 0 | +30% | + 60% | +40% | +20% | 0 | -10% |
| <u>Child (1-5 years)</u> | | | | | | | | | | | | | |
| Pakistan | +50% | + 30% | + 50% | | n.a. | | +10% | 0 | - 20% | +40% | +20% | +20% | +30% |
| South Asia | +40% | + 10% | + 60% | | n.a. | | +20% | +30% | - 20% | +30% | 0 | -20% | +10% |
| Worldwide | +50% | + 60% | + 60% | | n.a. | | +30% | +30% | + 60% | +40% | +10% | +10% | +10% |

n.a. = not available

Source: Hobcraft et al. (1985), and Pebley and Millman (1986).

shows that female mortality rates are lowest with second and third births. 2/ When age and parity are combined, older (35 and above), higher parity women and young mothers (under 20) seem to run higher risks than others. Eliminating all births after the fifth would reduce maternal mortality by half. 3/ Eliminating unplanned pregnancies can also reduce maternal mortality risks. Following Pakistan's combination of high maternal mortality and large number of unplanned pregnancies, an estimated 40% of maternal deaths could be averted if most pregnancies were planned. 4/

3.10 Impact on Health and Child Nutrition. Studies from around the world consistently show that an increase in the number of children shifts family budgets toward short-term spending on food. However, adequate amounts of food are not necessarily supplied. In Colombia, for example, the likelihood of malnutrition in preschool children was directly related to the number of siblings. 5/ Also in Colombia, the anthropometric scores of preschool children were reduced the higher the birth order of the child, the more siblings and the closer the children were spaced. 6/ Poorer families may also have poorer access to water supply and sanitation facilities, implying more diarrheal disease among their children.

3.11 Data on child health and family size are scarce in Pakistan. In a recent sample of low income urban neighborhoods in Pakistan, children from families with several children under 5 had lower weight for height relative to international standards than those in households with a smaller percentage of young children. 7/ An earlier study of 1000 children in the urban slums of Karachi showed mixed effects of high fertility. Family size was positively related to only one dimension of child nutritional status, and child spacing (of living children) had no effect. However, high parity had negative effects

2/ Winikoff, B. and Sullivan, M. (1987) "Assessing the role of family planning in reducing maternal mortality", Studies in Family Planning, 18(3), May/June, pp. 128-143.

3/ Winikoff, B. and Sullivan, M. (1987). op cit. Using the Khan data, eliminating births to women under 20 and over 34 in Bangladesh would avert about 50% of the maternal deaths and 30% of all births; limiting the number of births to five would reduce maternal mortality by a third and reduce births by about 15%.

4/ Main, Deborah (1985). "Mothers in Peril: The Heavy Toll of Needless Death", People 12(2), pp.6-8.

5/ Wray, J. D. (1971) Population Pressure on Families: Family Size and Child Spacing. Reports on Population/Family Planning, No. 9, New York, The Population Council.

6/ Heller, P. and Drake, W. (1979) Malnutrition, Child Morbidity and the Family Decision Process. Journal of Development Economics 6: 203-235.

7/ Alderman, forthcoming.

on red blood cell count. A most decisive nutritional factor was found to be length of breast-feeding, which had positive effects on three of seven measures of nutritional status. 8/

3.12 High fertility has been found to affect maternal morbidity in several countries, 9/ although the effects in Pakistan are not well documented. Repeated conceptions increase the risk of serious complications of pregnancy such as infections and hemorrhage. High fertility often means unplanned pregnancies and leads to induced (illegal) abortions which have serious side effects for women. Disorders associated with pregnancy and birth are among the most common cause of hospital admissions in developing countries. The effect of high fertility on mother's health (particularly the maternal depletion syndrome affecting mothers with frequent births) depends in part on a household's economic circumstances and the burden of physical work. 10/ Women in poor, rural households are more likely to suffer from the physical strain of multiple and closely spaced births, with constant breastfeeding, than their higher income, urban sisters.

The Effects of High Fertility on Education

3.13 The health and education of children are of importance to parents, to children themselves, and to society since these factors determine the productivity of the next generation. However, in low income households investments in the human capital of children, which provide lifetime returns to the child but possibly not to parents making the investments, may be sacrificed to more immediate household needs. This conflict is especially likely when the opportunity cost of education is high because of the associated loss of child labor in agriculture or house work. This effect, however can be offset by the longer-term gains of educating children, especially in a country like Pakistan, where the returns to education are high. 11/ The "new household economics" school of thought suggests that parental decisions on family size are related to the quality of the children they wish to have (that is, the amount that parents wish to invest in their children's education). The theory is generally interpreted to imply that households limit their total investment in education and accordingly make trade-offs between the number of children and per child investments in education. In their way, individual child education would be lower in large families.

3.14 Evidence from developing countries shows that although total household spending on education tends to rise with family size, expenditures per child on education tend to be lower in large families for all income and education levels of the parents. 12/ High fertility has a non-uniform effect

8/ Qureshi, T. (1982). "Determinants of Malnutrition", Applied Economic Research Center, University of Karachi, Discussion Paper No. 50, August.

9/ See papers for the conferences on "Safe Motherhood," Nairobi, February 1987; and "Better Health through Family Planning," Nairobi, October 1987.

10/ Winikoff, B. and Castle, M.A. (1987). The Maternal Depletion Syndrome: Clinical Diagnosis or Eco-demographic Condition?", Technical Background Paper for the International Conference on Better Health for Women and Children through Family Planning, Nairobi, Kenya, October 5-9, 1987.

11/ Kozel, V. and Alderman, H. (1988) "Factors Determining Work Participation and Labor Supply Decisions in Pakistan's Urban Areas", March (mimeo).

12/ Birdsall, N. (1980). Population Growth and Poverty in the Developing World", Population Bulletin 35, No.5.

on school participation rates, with the effect in rural areas being notably weak. 13/ In Egypt, for example, the number of children in the household below age 13 was negatively related to the years of school attended for three of four age-sex groups in urban areas, but had no correlation in rural areas. 14/ On the other hand, a study of families with twins in India found that the additional unexpected child represented by twins reduced enrollment levels of all children in the household. 15/ In Malaysia, families with a higher number of births were found to be characterized by lower schooling attainment for their children. 16/

3.15 Evidence for Pakistan is scarce. A 1980 survey of Punjabi men and women showed that family size had a positive effect on the number of years of school completed for both middle class urban females and rural males. For Punjabis who have already reached adulthood, the number of siblings does not seem to have constrained their educational achievement. 17/ Among the current generation of Pakistan children some evidence exists that young children below the age of 5 in a household reduce school participation for girls but not boys. Table 3.2 summarizes the differences in school attendance rates for boys and girls in low-income neighborhoods in urban Pakistan, according to the age and number of young siblings. In Pakistan, girls often must take care of younger siblings, which keeps them from going to school. On the other hand, girls from households with more adult women are more likely to go to school. Cultural factors that discourage families from sending girls to schools may also be relevant.

3.16 The social goal of educating women is particularly threatened by high family fertility. More generally, school attendance for both boys and girls is clearly linked to poverty. In low-income neighborhoods, the higher the household's living standard (as measured by its expenditure) and the better educated the household head (primary school and above), the more likely the children are to attend school. Household involvement in a family enterprise, however, reduces school participation, especially for boys, probably because of the need for children's help in the enterprise. Ethnicity also plays a role. Pathan boys are more likely to attend school than other boys, but Pathan girls are less likely than other girls. 18/

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- 13/ Birdsall, N. and Cochrane, S. (1982). "Education and parental Decision Making: A two-Generation Approach", in Lascelles, A. and Windham, D. M. eds. Education and Development. Lexington, Mass. D. C. Heath, 1982), pp. 175-210; Tan, J.P. and Haines, M. (1984). "Schooling and Demand for Children: Historical Perspectives", World Bank Staff Working Paper No. 697, November.
- 14/ Cochrane et al (1986). "The Educational Participation of Egyptian Children", Education and Training Series, Report No. EDT45, World Bank.
- 15/ Rozenzweig, M. R. and Wolpin, K. L. (1980).
- 16/ Rozenzweig, M. R. and Schultz, T. P. (1982). "Market Opportunities, Genetic Endowments and the Intra family Resource Distribution: Child Survival in Rural India", American Economic Review, 72 (1982).
- 17/ King, E.M. et al (1986). "Changes in the Status of Women Across Generations in Asia", Rand R-3399RF, December.
- 18/ See regressions in Annex 3, Tables 1 and 2.

TABLE 3.2: EFFECT OF YOUNG CHILDREN ON SCHOOL PARTICIPATION OF MALES AND FEMALES AGES 5 TO 20 YEARS IN LOW INCOME AREAS OF URBAN PAKISTAN

| | <u>Percentage Attending School</u> | |
|---|------------------------------------|----------------|
| | <u>Males</u> | <u>Females</u> |
| Average participation with no other young children | 65 | 41 |
| Participation of those with one other child under 5.* | 61 | 35 |
| Participation of those with one other child 5-9. | 63 | 38 |
| Participation of those with one other child under 5* and one other child 5-9. | 61 | 36 |
| Participation of those with two other children under 5.* | 61 | 36 |
| Participation of those with two other children under 5* and two 5 to 9 | 58 | 31 |

* Underlying regression coefficient for children under 5 is statistically significant at 5% or better.

Source: International Food Policy Research Institute/Pakistan Institute of Development Economics (IFPRI/PIDE) sample of 1000 urban, low-income households in Pakistan. Calculated from logit equations for school participation by males and females 5-20 years old in these neighborhoods. Other variables in the equation are age of the child, household expenditures, household participation in a family enterprise, males and females by age categories (10-14, 15-60, 60+), education of household head, and Pathan ethnicity. All neighborhoods have access to primary schools. Regression results reported in Annex 3 Tables 1 and 2.

Number of Children and Household Income

3.17 In Pakistan, larger households have higher total income. As Table 3.3 shows, the higher the household income, the larger the mean number of living children. In part, this is the life cycle effect at work - older people, especially men, earn more and at the same time have more children than younger people. At the same time it is possible that higher income households have more children because they can afford them and survival rates are higher. Alternatively, large families need more income and hence utilize both children and adults to support the household. Probably, all three effects are operating. But several features point to the particular importance of the latter. First, the low level of contraceptive use in Pakistan suggests a limited ability to plan family size. Current levels of contraceptive use are estimated at 9%, with a possible additional 5% too "shy" to report use. Second, current contraceptive usage is low compared with the 43% of currently married women aged 15-49 who say that they do not want more children. The total fertility rate (about 6.5 births per woman of child-bearing age) is above the mean desired number of children (4.9), according to the Pakistan Contraceptive Prevalence Survey. These elements imply unwanted fertility. Finally, per capita income for the family drops with each additional child, ^{19/} suggesting a lower standard of living for large families and declining per capita resources for investing in children. Although there are economies of scale in consumption, the uniform drop in per capita income shown in Table 3.3 also suggests that more family members -- including children -- need to work in large families in order to support themselves.

The Effect of Children on Family Labor Supply

3.18 The effect of high fertility on family labor supply is one of the most highly debated areas in the economics of fertility. One possible effect deals with the direct contribution of child labor to household income. A common argument is that parents have large numbers of children in order to have access to child labor. Two relevant questions are: One - how high is child labor participation in Pakistan? Two - do families have high fertility in order to have child labor, or is child labor one way of coping with the high burden of additional children? The evidence for "coping" was discussed above (para. 3.17).

3.19 Children can also influence the labor contribution of others in the household. The impact of family size on the contribution of women to household income has received the most attention in the literature. Two opposing forces are at work: women may elect to opt out of the labor force and stay at home with their children, or may decide to leave the home to look for work to support them. Men may also work more intensively to support their dependents. Since men tend to work regardless of the number of children, the number of hours they work per week, rather than labor force participation per se, will be affected.

3.20 If children and adults in large families must work more than those in smaller families in order to make ends meet, their well-being is compromised. When work keeps children out of school, their future is further compromised. For adults, working more hours means less leisure and less time for household chores, especially for women. In this section, children's own work

19/ This is a pattern found in a number of other developing countries. See Birdsall, N. and Griffin, C. (1987). "Population Growth and Poverty in Developing Countries", Draft.

TABLE 3.3: NUMBER OF CHILDREN (AGES 0-14) AND HOUSEHOLD INCOME

| <u>Total</u> | | <u>Urban</u> | | <u>Rural</u> | |
|----------------------------------|--------------------------------|----------------------------------|--------------------------------|----------------------------------|--------------------------------|
| <u>Household Income Quintile</u> | <u>Mean Number of Children</u> | <u>Household Income Quintile</u> | <u>Mean Number of Children</u> | <u>Household Income Quintile</u> | <u>Mean Number of Children</u> |
| 1 (Poor) | 1.9 | 1 | 2.1 | 1 | 1.7 |
| 2 | 2.7 | 2 | 2.8 | 2 | 2.5 |
| 3 | 3.0 | 3 | 3.2 | 3 | 2.9 |
| 4 | 3.4 | 4 | 3.4 | 4 | 3.2 |
| 5 (Rich) | 3.6 | 5 | 3.4 | 5 | 3.7 |

| <u>Total</u> | | <u>Urban</u> | | <u>Rural</u> | |
|---|--------------------------------|---|--------------------------------|---|--------------------------------|
| <u>Household Per Capita Income Quintile</u> | <u>Mean Number of Children</u> | <u>Household Per Capita Income Quintile</u> | <u>Mean Number of Children</u> | <u>Household Per Capita Income Quintile</u> | <u>Mean Number of Children</u> |
| 1 | 4.3 | 1 | 4.6 | 1 | 4.1 |
| 2 | 3.5 | 2 | 3.7 | 2 | 3.5 |
| 3 | 2.9 | 3 | 3.0 | 3 | 2.8 |
| 4 | 2.2 | 4 | 2.2 | 4 | 2.1 |
| 5 | 1.5 | 5 | 1.5 | 5 | 1.5 |

Source: Tabulations from the 1984-85 Pakistan Household Income and Expenditure Survey.

participation as well as their possible effects on the labor contribution of other household members are reviewed.

3.21 Child Labor Participation Precise estimates of the effect of the economic contribution of children are not available. Child labor is difficult to measure since it often contributes to household enterprises rather outside employment.^{20/} When data comparisons can be made, Pakistan's labor participation rate for male children is higher than in many other developing countries. According to Pakistan's 1981 Population Census, 35% of males aged 10 to 14 and about 60% of those aged 15 to 19 were in the labor force. Table 3.4 compares the labor participation of children 10 to 14 for various years in Pakistan with that of other developing countries. Pakistan's figures are substantially above those found for the same period in Egypt or other South Asian countries such as India and Sri Lanka. Pakistan's male children work about as hard as children in rural Africa (Ivory Coast and Botswana), where fertility rates are comparable to Pakistan's, and in urban Nepal, where fertility is somewhat lower. A sharp difference exists between the work participation rates of Pakistani boys and girls. This differential is larger than for most other countries. This may explain in part why Pakistani parents apparently prefer male children.

3.22. Children's contributions to family income depends on the amount they work and their rate of remuneration. Although precise data are not available for Pakistan, data from rural areas in other developing countries show that boys 10-14 often work 50-70% as much as adults.^{21/} Since children are paid considerably less than adults, however, the income contribution of a working male child will be relatively low. In the rural Philippines, for example, children contribute about 20% of the family's market income and about 30% of the value of home production. ^{22/}

3.23. While many children in Pakistan contribute to household income, they are not necessarily more likely to work in large families than in small ones. An analysis of low-income households in urban Pakistan showed that the number of young children had no effect on the labor participation rates of other children in the household. Researchers have made similar findings for other

20/ Estimates in 1975 indicated that 80% of the children working worldwide were unpaid family workers. Tan, J. P. and Haines, M. (1984), p.58. "Schooling and Demand for Children: Historical perspectives." World Bank Staff Working Papers No. 697, p. 58.

21/ Rural Java, Nepal, Egypt: rice growing areas; Lindert, Peter H. (1980). Child Cost and Economic Development in Esterlin, R.A. Ed. Population and Economic Change in Developing Countries, Chicago University Press. Hart, G. (1980). Patterns of Household Labor Allocation in a Javanese Village," in Binswanger, H. et al. eds. Rural Household Studies in Asia (Singapore: Singapore University Press.) Cain, Mead T. (1979). The Economic Activities of Children in a Village in Bangladesh," Population and Development Review, 3(3), September.

22/ King, E. M. (1987). "The Effect of Family Size on Family Welfare: What Do We Know?" in Johnson, D. G. and Lee, Ronald D. eds. Population Growth and Economic Development: Issues and Evidence. (Madison: The University of Wisconsin Press) pp. 373-411.

TABLE 3.4: LABOR PARTICIPATION OF CHILDREN IN PAKISTAN
AND OTHER DEVELOPING COUNTRIES

(Percentage of Children Aged 10-14 Participating in the Labor Force)

| <u>Pakistan 1/</u> | <u>Urban</u> | <u>Rural</u> | <u>Total</u> | | |
|------------------------------|---------------------|---------------------|---------------------|---------------------|--------------|
| 1961 | | | | | |
| Males | 18.4 | 45.6 | 38.3 | | |
| Females | 1.4 | 6.0 | 4.7 | | |
| 1972 | | | | | |
| Males | 26.1 | 44.8 | 39.5 | | |
| Females | 10.1 | 10.4 | 10.4 | | |
| 1981 | | | | | |
| Males | 17.8 | 41.4 | 34.7 | | |
| Females | 1.4 | 4.0 | 3.2 | | |
| <u>Egypt 2/</u> | <u>Urban</u> | <u>Urban</u> | <u>Rural</u> | <u>Rural</u> | <u>Total</u> |
| | <u>Lower Income</u> | <u>Upper Income</u> | <u>Lower Income</u> | <u>Upper Income</u> | |
| 1980 | | | | | |
| Males | 18.1 | 4.2 | 28.9 | 22.2 | 19.6 |
| Females | 3.7 | 0.0 | 10.0 | 4.6 | 6.1 |
| <u>Gujarat, India 3/</u> | | | | | |
| 1972-73 | | | | | |
| Males | | 4.4 | | 19.4 | |
| Females | | 1.5 | | 20.3 | |
| <u>Maharashtra, India 3/</u> | | | | | |
| 1972-73 | | | | | |
| Males | | 5.0 | | 20.1 | |
| Females | | 2.8 | | 22.7 | |
| <u>Sri Lanka 3/</u> | | | | | |
| 1969-70 | | | | | |
| Males | | | | | 6.3 |
| Females | | | | | 3.5 |
| <u>Ivory Coast 4/</u> | | | | | |
| 1986 | | | | | |
| (Worked in last 12 months) | | | | | |
| Males | | 5.0 | | 54.9 | 35.0 |
| Females | | 6.4 | | 54.1 | 31.5 |
| <u>Peru 4/</u> | | | | | |
| 1986 | | | | | |
| (Last 7 days) | | | | | |
| Males | <u>Lima</u> | <u>Other Urban</u> | <u>Rural</u> | | |
| Females | 17.5 | 25.3 | 63.5 | 40.6 | |
| | 13.8 | 20.8 | 60.3 | 37.8 | |

Sources: 1/ Population Censuses of Pakistan
2/ Halloua et al (1983)
3/ Visaria (1980)
4/ Tabulations, Living Standards Measurement Surveys.

developing countries. 23/ Since access to schooling is uneven in Pakistan, some children may be working because they have no school to attend.

3.24 Impact on Adult Labor Supply. Children affect family labor supply indirectly by influencing parental labor participation.24/ For Pakistan, the presence of children seems to have no effect on female labor participation in rural areas and a mixed effect in urban areas.25/ In low income urban neighborhoods, small children below the age of seven had no effect on women's labor force participation. The presence of older girls 7 to 14 increases women's labor participation while 7-14 year old boys reduce it. Thus, the overall effect of children nets to zero. These results are consistent with expectations--girls, unlike boys, are not likely to work outside the home, requiring as well as enabling mothers to work. The opposite is true for boys. However, it should be noted that the results may not be very robust, in view of the low labor force participation of urban women in Pakistan and possible errors in measuring their participation.

3.25. Surprisingly, adult men from these same low-income urban neighborhoods seem to adjust their working hours to the number of children more than the women. The self-employed, who have more latitude to adjust their hours, are more flexible in this regard than wage workers. Table 3.5 shows the additional hours worked for different family configurations. A self-employed man is likely to work as much as 4-5 hours more per week for each child between the ages of 7-14. Thus, a man with a wife and four children (two below 7 years of age and two between 7-14) would work between 6 and 15 additional hours more than a single man, depending on whether he works for someone else or is self-employed. The additional effect of family size is

23/ Studies typically do not find any significant relationship (Tan and Haines, 1984) op. cit. Nag, M. et al (1980). "An Anthropological Approach to the Economic Value of Children in Java and Nepal," in Sinsawanget et al eds. Rural Household Studies in Asia. (Singapore, Singapore University Press). Mueller, Eva. (1981). "The Value and Allocation of Time in Rural Bostawana," The World Bank, Population and Human Resources Division, Discussion Paper No. 81-84. de Tray, Dennis (1983). "Children's Work Activities in Malaysia," Population and Development Review, 9(3), September, pp. 437-455. Cochrane, S. H. and Yazbeck, A. (1989) "Determinants of Labor Participation in Egypt," Draft.

24/ The evidence from other countries seems to vary by level of development. "In nonindustrialized, low-income environments, women's involvement in productive activity will have little relationship to fertility at the macro level; as industrialization and the growth of wage employment spread, an inverse relationship will become more likely...." Standing Guy (1983). "Women's Work Activity and Fertility," in Bulatao, R. A. and Lee, R. D. eds. Determinants of Fertility in Developing Countries (New York: Academic Press) p. 533; Evidence from Sri Lanka. Sahn, D. and Alderman, H. "The Effects of Human Capital and Determinants of Labor Supply in a Developing Country," Journal of Development Economics (Forthcoming); and Egypt, Cochrane and Yazbeck (1987) op.cit., confirm this finding.

25/ Urban study: regression analysis on IFPRI survey data; Rural Punjab: Khaliqzaman (1987). Female Labor Force Participation in Economic Activity. Punjab Economic Research Institute, Lahore; Draft.

TABLE 3.5: SUMMARY OF DEMOGRAPHIC EFFECTS ON LABOR SUPPLY DECISIONS OF ADULT MALES IN URBAN PAKISTAN

| | <u>Additional Hours Worked</u> |
|--|------------------------------------|
| <u>Wage Sector:</u> Additional hours worked per week per additional household member | |
| Children 0-6 years old | 1.16 * |
| Females | |
| 7-14 years old | 1.73 * |
| Adult (15+ years old) | 1.15 |
| Males | |
| 7-14 years old | 1.14 |
| Adult (15+ years old) | 4.01 ** |
| <u>Self-Employed Sector:</u> Additional hours worked per week per additional household member | |
| Children 0-6 years old | 0.43 |
| Females | |
| 7-14 years old | 5.14 ** |
| Adult (15+ years old) | 4.12 ** |
| Males | |
| 7-14 years old | 4.42 ** |
| Adult (15+ years old) | 4.16 ** |

* denotes significance at the 95% confidence interval.

** denotes significance at the 99% confidence interval.

Source: Based on IFPRI/PIDE Survey. Regression in Annex 3, Table 3.

strongest after children reach the age of 7, suggesting that the marginal cost of having children is minimal until they reach school age.

The Effect of Children on Savings

3.26. Even though the effect of high fertility on total income may be positive, most researchers believe that this is more than offset by the negative effect on additional consumption associated with children in their dependent years. Thus, high fertility probably has a negative effect on monetary savings when children are young. In addition, children may depress savings because they themselves are seen as a substitute for monetary savings by providing old age support. The international evidence from developing countries has not confirmed any systematic relationship between fertility and savings. Most of the studies reviewed by Chernichovsky (1978) 26/ and Hammer (1985) 27/ have been at the aggregate level. The few studies of fertility and savings at the household level in developing countries have been equally ambiguous. 28/

3.27. The number of children is often less important than the age structure of the household. The age of the head of household (a proxy for his place in his career) and the ages of children make an enormous difference in household economic behavior. In regard to children, timing rather than total amount of lifetime savings is most relevant. Educating children is expensive. But the education of one's children is an investment--a saving for the future--and excluding educational expenses can mean omitting an important aspect of saving.

3.28. Savings and Fertility in Pakistan. The 1979 Household Income and Expenditure Survey provides the basis for analyzing what effects children have on household savings in Pakistan. 29/ Children affect household savings

26/ Chernichovsky, D. (1987). "Personal Savings and Family Size and Composition: The Unresolved Issue," IUSSP Conference on Economic and Demographic Change: Issues for the 1980's Helsinki.

27/ Hammer, J. S. (1985). "Population Growth and Savings in Developing: A Survey," World Bank Staff Working Paper No. 687, March.

28/ Kelley, A. C. and Swartz, C. (1987). "The Impact of Family Structure on Microeconomic Decision Making in Developing Countries: A Case Study of Nuclear and Extended Families in Urban Kenya," IUSSP Conference on Economic and Demographic Change: Issues for the 1980's." Helsinki, 1978. Kelley, A. C. (1980). "Interactions of Economic and Demographic Household Behavior," in Easternlin, Richard A. eds. Population and Economic Change in Developing Countries (Chicago: The University of Chicago Press). Kelley, A. C. and Williamson, J. G. (1968) "Household Savings Behavior in the Developing Economics: The Indonesian Case," Economic Development and Cultural Change, 16(3), April, pp. 385-403.

29/ The analysis extends an earlier study by Akhtar (1982), ("Household Savings Behavior in Urban Pakistan," Applied Economics Research Center, University of Karachi, Research Report No. 64, October) using the same data source. The study found that when financial savings plus educational expenditures (investment in human capital) were combined, additional household members below the age of 15 reduced the level of family savings only for those families with more than three children. However, the coverage and methodology differ from the analysis described in this section. Only the urban part of the survey was used; furthermore, there was no age distribution for the dependent children and only the direct savings effect was calculated.

directly and indirectly. They affect savings directly by their consumption of household income. This effect tends to be negative and is most significant for children below age 15. Offsetting increased consumption is the indirect income effect. Children in Pakistan tend to raise family income, because the children themselves work and because adult males tend to increase their hours of work. Higher household income means higher household savings since the marginal propensity to save out of additional income is usually positive. This positive, indirect effect, of children on savings somewhat offsets the negative direct effect.

3.29. Both effects are incorporated in the analysis, the results of which are shown in Table 3.6. (Annex 3 explains the procedure in more detail and contains the regressions themselves.) The Table indicates that the effect of children on savings depends on their age and sex. The type of employment of the household head also matters. Prior to reaching age 15, the total effect is negative and significant. The effect is largest in rural areas but in both rural and urban areas there is a wide range between the maximum and minimum effect. For the average urban household, the presence of a child reduces savings only after the child reaches school age. Boys 6-14 in these urban households have a smaller negative savings effect than girls in the same age range, presumably because they are more likely to be earning cash income. The average reductions in savings are 2-3 rupees per month for boys, and 4-6 rupees per month for girls (1979 prices), representing 3-10% of monthly household savings. In rural areas, the negative savings effect is larger. Children under 14, including the youngest ones, reduce household savings by some 25% to 40%. This stronger savings effect in rural areas is somewhat surprising, given the usual view that consumption by children can be spread out more easily in farm households than in urban households and that children typically work on farms.

3.30. By the age of 15, as earnings increase substantially, positive total effects begin to emerge, especially for males. On average, it takes a relatively short period of time, about two years, for urban men to repay their childhood savings losses (even if discounted values are used) 30/ because of small childhood dissavings. For urban women, it would take about seven years. In rural households, in contrast, the childhood savings losses are essentially not recouped for either boys or girls, given the magnitude of the early savings losses relative to subsequent earning and saving opportunities. For rural women the indirect effects are also negative and there is no repayment. This result, it should be noted, is heavily affected by the poor estimates of labor force participation and earned income for women, as well as by the difficulty of measuring rural savings in general.

Summary

3.31 Global evidence shows that the consequences of high fertility at the family level are far-reaching. They are especially serious among the poor. The children of the poor, in particular, bear the heavy burden of both high fertility and poverty. Studies in Europe, the United States and a few

30/ Discounting is important, given the long period of time involved and the fact that a dollar saved or spent this year is worth a different amount than one saved or spent 15 years from now. For illustrative purposes, a discount rate of 10% was used.

TABLE 3.6: CHANGES IN MONTHLY SAVINGS IN PAKISTAN ASSOCIATED
WITH ADDITIONAL HOUSEHOLD MEMBERS
(Rs. per month)

| | <u>Urban Households</u> | | <u>Rural Households</u> | |
|--|--------------------------------|-------------------------------|--------------------------------|-------------------------------|
| Average savings (Rs/mo.) | 59.7 | | 22.0 | |
| Effects of One <u>Additional Person</u> | <u>Direct</u> <u>Effect</u> | <u>Total</u> <u>Effect</u> | <u>Direct</u> <u>Effect</u> | <u>Total</u> <u>Effect</u> |
| Children under 6 yrs. | -3.7* | -0.2* | -9.3* | -5.2* |
| Males, 6-9 yrs. | -5.7 | -2.9 | -11.5 | -6.9* |
| Males, 10-14 yrs. | -7.9* | -1.9* | -19.1* | -9.3* |
| Males, 15+ yrs. | 13.2* | 25.8* | 0.0 | 16.3* |
| Females, 6-9 yrs. | -8.3* | -6.4 | -10.7* | -6.0* |
| Females, 10-14 yrs. | -8.7* | -3.6* | -21.0* | -5.5* |
| Females, 15+ yrs. | 4.7 | 13.9* | -13.9* | -1.7* |

Source: Derived from Annex 3, Tables 4, 5, 7 and 9.

* Statistically significant at 5% in savings equation for direct effect and income equation for indirect effect.

developing countries have shown that children from larger families tend to be disadvantaged (shorter, less intelligent and less likely to survive), with the negative effect of family size being greatest in low income groups. 31/ High fertility has several important consequences on family well-being in Pakistan. Among the most important consequences are the negative health effects of high parity, close child spacing and the age of the mother on infant and child mortality. The effect on maternal mortality and morbidity and on child health in Pakistan are less well-documented, although partial evidence and data for other countries point to a similar deleterious effect.

3.32. Family size seems to affect work decisions of the household. Large families in Pakistan have higher total family income, but lower per capita income. Although it is impossible to separate families which have many children because they can afford them from families that must work more to support children they cannot easily afford, most Pakistani families probably fall into the second category. With low contraceptive use and relatively high infant mortality rates, family planning is not very precise or effective. Since per capita income falls as family size increases, living standards usually fall when families are large, even with economies of scale in consumption. While children often contribute directly to household resources or stimulate others (notably adult men at the lower end of the income scale) to work harder when circumstances permit, these responses are not necessarily desirable if children's education or family leisure is sacrificed.

3.33 High fertility also can affect future family living standards. The more that young boys in Pakistan work to make ends meet, the more they compromise their future by neglecting their education. In addition girls are less likely to attend school if they come from large families. Families sacrifice savings when children are young; the more children a family has, the more savings are sacrificed. While the typical family seems to recoup savings later in cash terms, or in non-monetary ways when their children grow up, large families endure a drain on savings for a number of years. This constitutes a loss for the nation, if not for the individual family.

31/ Birdsall (1977). "Analytical Approaches to the Relationship of Population Growth and Development." Population and Development Review 3. No. 1-2: 63-102.

CHAPTER 4

POPULATION GROWTH AND PUBLIC SERVICES

Introduction

4.01 This chapter examines how the provision of selected public services--education, health and urban services--is affected by rapid population growth in Pakistan. These services are chosen because of their particular sensitivity to changes in demographic variables (that is, population growth, size, density and distribution). Global evidence ^{1/} has demonstrated that rapid population growth constrains a country's ability to improve its human resource base. At the household level, studies show that children from large families have lower school participation, lower educational attainment and poorer health, the harm being greatest the poorer the family. ^{2/} Conversely, poor coverage, low quality and minimal use of certain public services is itself a major cause of sustained population growth. Many studies have demonstrated that low levels of education attainment, especially among women, inadequate provision of basic health services and physical infrastructure, and poor housing, water and sanitation all work against fertility reduction. ^{3/} Many of these characteristics are typically concentrated among the poor and render fertility reduction particularly difficult precisely where it is most urgently needed. In Pakistan, poor progress to-date in providing these services on a nation-wide basis offers a significant part of the explanation behind the sustained high rate of population growth. Now confronted with a much larger population as a result of past policy, and a major "service deficit", the task of providing public services to the bulk of the population is all the more costly and difficult.

4.02 Current circumstances require that public finance issues have a central position in any development agenda. Public finance not only shapes the course of development in a developing country such as Pakistan, it influences the balance of payments, the foreign debt, interest rates and inflation. At 25% of GDP, public spending in Pakistan has already reached

1/ See, for example, Kelley, A. (1976). "Demographic Change and the Size of the Government Sector", Southern Economic Journal, 43,2, October.

2/ Birdsall, N. forthcoming (1989). Economic Analyses of Rapid Population Growth. Mimeo.

3/ See, for example, Cochrane, S. (1976) "The Effects of Education on Fertility and Mortality". EDT Discussion Paper 26, World Bank, May.

major proportions. In most recent times the growing fiscal deficit--the gap between revenues and expenditures--has caused concern both domestically and internationally and has raised serious questions over domestic resource mobilization, and the level and composition of government spending. The interaction of population growth with public finance is thus of great importance in Pakistan for reasons of short-term concern over the fiscal deficit and the longer-term concern with the course of development. 4/ The public services that form the focus of discussion in this chapter have historically accounted for 15-18% of total (consolidated) public expenditure and their share is rising. 5/

4.03 This chapter is organized as follows. The first part looks at each of the three services--education, health and urban--in turn. Preceding the discussion of the impact of future population growth on service needs and costs is a review of the present situation. This review of the present is particularly important for four reasons: (i) it highlights the fact that past population growth together with years of inadequate spending on social services and urban infrastructure has culminated in a large gap between the demand for services and infrastructure and their supply; (ii) the inadequacy of current public service provision--especially education and primary health care--helps explain why fertility and infant mortality rates have remained high in the past, and why a rapid decline in future fertility is highly unlikely; (iii) the current deficit between service supply and demand implies that a "catching up" exercise is needed that could eat up most of the resources available for the next decade at the very same time that new demands associated with additional population are emerging; finally (iv) Pakistan can deal with the demands of its growing population only if it is aware of current and past shortcomings in public policy.

4.04 In examining the consequences of future population growth on public services, a common approach is adopted throughout. Specific service and

4/ Evidence from elsewhere on the relationship between population growth and public finance is very limited, but what exists supports the general thesis that the rate of population growth plays an important role in determining the level of demand for publicly financed goods and services, and for certain physical infrastructure (e.g. housing). Work by Dunlop and Prevoo (1987) on Africa, for example, concludes that rapid population growth exacerbates the achievements of a country's human resource improvement objectives, typically an important public objective, by substantially increasing the cost of it. Schultz (1985), on the other hand, finds from a cross section of developing countries that an increase in the school age population does not necessarily induce an equivalent increase in total school expenditure, thereby resulting in a lower level of per pupil expenditure.

5/ Other expenditures which are accorded considerable weight in the budget, such as power, defense, agricultural subsidies and public administration, may also be influenced by population growth but their investigation is beyond the scope of this report.

infrastructure targets are established and the facility, staffing and cost implications associated with meeting these targets are assessed. These targets are more quantitative than qualitative but improved service quality is recognized to be an equally important objective. The second part of the chapter brings together the projected needs of the various public services and looks at the combined impact of these on future government budgets. In view of the magnitude of future service needs and the difficulties associated with meeting them, the chapter concludes by looking at policy options to accommodate population growth.

EDUCATION

4.05 The role of human capital in growth is well established in developed and developing countries alike. Inadequate investment in human capital formation has serious consequences. Aside from future productivity losses in agriculture and industry, neglecting education--especially for females--leads to persistent high fertility and high infant and maternal mortality. 6/ In general, educated women:

- * marry later;
- * use contraceptives more frequently;
- * want and have fewer children;
- * lose fewer children in the first years of life because of better child spacing, better nutrition, and hygiene;
- * use modern health systems (and programs such as immunization) more than their uneducated peers.

These tendencies are particularly strong for urban women who have completed secondary school. Pakistan's ability to educate its population is thus of great importance.

Current Position and Recent Trends

4.06 All levels of Pakistan's education system are underdeveloped and underfinanced, absolutely and relatively. By any measure (per capita income or relative to GNP) public investment in education is among the lowest in the developing world, including South Asia and Africa. Low investment levels are reflected in the education system's

- * poor coverage;
- * low participation rates at all levels;
- * high dropout rates;

6/ Cochrane, S. (1986). Op Cit.

- * high rates of illiteracy (Pakistan's 1981 literacy rate of 26% compares to 43% for India and 87% for Sri Lanka);
- * very poor quality.

Although lack of investment in education has hurt the entire population, women have suffered most. With few exceptions, the female adult population is illiterate--the 1981 Census recorded a female literacy rate of 16%.

4.07 Participation Rates. Although school and college enrollments have expanded since independence, participation remains very low. (Annex 5, Table 1) For example, the primary school participation ratio is currently 53%. 7/ This compares with 92% in India, 60% in Bangladesh, and 100% in Sri Lanka. At secondary levels and above, Pakistan's participation ratios are also poor. Most recent estimates suggest a participation ratio of about 23% in secondary school and 3% in post-secondary education. One of the distinguishing features of Pakistan's education system is the marked variations between male/female and rural/urban participation. These give rise to differential literacy rates. For example, twice as many boys attend primary school as girls, and three times as many boys attend secondary schools and colleges. 8/ Primary participation rates are 50% higher in urban areas than in rural areas. At the secondary level, the urban participation ratio is four times as high as in rural areas. Although Pakistan is predominantly rural, more children are enrolled in urban secondary schools than in rural secondary schools. 9/

4.08 Budget Trends. Since the beginning of the Sixth Plan period in 1983, when public expenditure on education was 1.6% of GNP, education spending has expanded rapidly. Estimates for 1988 suggest that allocations have grown to 2.4% of GNP (Annex 5, Tables 2 and 3). Although a large increase, this level of spending on education is, however, still very low (developing countries average 4.4% of GNP). Moreover, growing fiscal deficits will probably end the upward trend in public expenditure on education. One particular concern is that budget stringency will further limit recurrent expenditure, thus damaging service effectiveness. Historically recurrent

7/ The gross participation ratio, including under-age as well as over-age children, is currently about 60 percent - 79 percent for male children and 42 percent for female children. If under-age (i.e. kindergarten) children are removed from Grade 1 enrollment, the gross participation ratio falls to 53 percent overall, 69 percent for boys and 35 percent for girls.

8/ Low female secondary school enrollment is particularly significant from a fertility point of view since it is at levels of secondary education and higher that fertility rates typically begin to decline.

9/ The overall rural-urban population balance is 70 percent rural, 30 percent urban.

education outlays have been especially low in Pakistan. An analysis of the education budgets for Punjab and Sind Provinces illustrates how recurrent spending is almost entirely concentrated in personnel (Annex 5, Table 4). At the primary level approximately 96% of it goes for salaries and allowances; figures for secondary and college education are 94% and 95%. Concentrating the recurrent budget on salaries means little is spent on teaching and learning materials, or maintenance. Research and evidence from other developing countries shows that these inputs are critical to the learning process.

4.09 The Current Deficit. Pakistan's education system faces a rapidly growing school age population from a deficit position in infrastructure, teachers, and learning materials. The task of "catching up" is already awesome. As many children (7-8 million) do not attend primary school as those who do. Of those enrolled, fewer than 50% complete the five-year primary cycle. This implies that of today's 15 million or so primary-aged children, fewer than 4 million will learn how to read, and 11 million will not. This terrible prospect does not bode well for Pakistan's future prosperity or its attempts to reduce the fertility rate.

Projected Demand for Public Education Services

4.10 Primary education in Pakistan would be one of the early beneficiaries of lower fertility. Primary school in Pakistan starts at age 5. If the fertility rate began to fall immediately, as projected in the "low" population growth scenario, a big decrease in the number of primary aged children (1.8 million fewer children, or 10% of the age group) would emerge by 1995. By 2000, the difference amounts to 3.9 million fewer primary aged children (17% of the age group -- Table 4.1). By that time the gains of lower fertility would have spread to the secondary education age group. Five years later the gains would also have spread to tertiary aged people. By 2025, the difference at all levels of the education system is striking. If fertility rates fall sharply according to the low growth scenario (Table 2.9), primary schools would have to cope with 13.7 million fewer children, secondary schools with 11.8 million fewer, and intermediate schools/colleges with 9.4 million fewer children. 10/

4.11 An enrollment-finance model illustrates the effects of population growth on education services. 11/ (Annex 3 has the details.) The model

10/ Not all the additional children would be educated in public schools. Large numbers of children are currently attending private schools in Pakistan. A recent report (World Bank Report No. 7110-PAK) estimated private school enrollment at 10% of all enrollment.

11/ Data on dropouts, repeaters and under-age children are derived from recent research carried out by the Academy of Educational Planning and Management (Islamabad). Data on salary costs, costs of classroom construction and costs of equipment come from provincial and GOP sources, recent Staff Appraisal Reports and estimates from the recent Education Sector Strategy Review.

**TABLE 4.1: HIGH AND LOW POPULATION PROJECTIONS FOR SCHOOL AGED CHILDREN,
1990-2025
(thousands of children)**

| <u>Year</u> | | <u>Age Group (years)</u> | | |
|-------------|--------------|--------------------------|------------------|---------------------|
| | | <u>Primary</u> | <u>Secondary</u> | <u>Intermediate</u> |
| | | <u>5-9</u> | <u>10-14</u> | <u>15-19</u> |
| 1990 | : high | 16,899 | 13,579 | 11,373 |
| | : low | 16,899 | 13,579 | 11,373 |
| | : difference | = | = | = |
| 1995 | : high | 19,480 | 16,728 | 13,418 |
| | : low | 17,679 | 16,728 | 13,418 |
| | : difference | 1,801 | = | = |
| 2000 | : high | 22,546 | 19,315 | 16,561 |
| | : low | 18,649 | 17,529 | 16,561 |
| | : difference | 3,897 | 1,786 | = |
| 2010 | : high | 28,704 | 25,241 | 22,227 |
| | : low | 21,376 | 19,774 | 18,385 |
| | : difference | 7,328 | 5,467 | 3,842 |
| 2025 | : high | 36,548 | 34,823 | 31,844 |
| | : low | 22,830 | 23,036 | 22,448 |
| | : difference | 13,718 | 11,787 | 9,396 |

Source: Table 2.9 and Annex 1.

focuses only on primary education and produces two scenarios. The first assumes the 7th Plan primary enrollment targets and traces the different participation ratios that result under the two population growth projections and their implications for classrooms, staff, and budgets. 12/ The second scenario assumes a target participation ratio for the year 2000 and calculates the implied enrollments during 1988-2000 under low and high rates of population growth. The variation in enrollments is then translated into needs for classrooms, teachers, and budget, assuming constant per pupil inputs. While the first scenario illustrates the continuing problem of large numbers of children remaining outside the education system with high population growth and a constrained supply of public education services, the second scenario illustrates the additional demands for facilities, staff, and budget that are associated with larger numbers of school aged children. 13/

4.12 Scenario 1: Seventh Plan Enrollment Targets. The 7th Plan's ambitious primary enrollment targets are essential if most primary aged children will attend school by 2000. Grade one enrollments are projected to grow 5.5% annually for boys and 9.0% for girls. 14/ To achieve a participation ratio of 70% and the planned enrollment growth of 3.4 million children in 1993, a total of 145,000 additional teachers and 130,000 additional classrooms are needed (assuming constant teacher:pupil ratios but higher expenditures on books and materials. (See Annex 5, Table 5. Annex 4 contains detailed year-by-year estimates.) The estimated public cost of this unprecedented effort (in 1987 prices) is Rs 31 billion (Rs 6.2 billion annually, compared with Rs 5.0 billion in 1987) of which 23% is investment and 77% is recurrent. Under these projections, by the year 2000, primary enrollment will have reached almost 20 million, at a cost of about Rs 15 billion annually (or three times the current level of outlay).

12/ Participation ratios describe the proportion of children in a specified age group enrolled in school. In this section gross participation rates are used: these are calculated by taking total primary school enrollment (less under-age children but including over-age children) and dividing by the population aged 5-9 years inclusive. A gross participation ratio of 100 percent does not necessarily imply that all appropriately aged children are enrolled in school since over-aged children and repeaters typically inflate the figures.

13/ A third scenario could have been developed to illustrate a possible detrimental effect on quality of education (e.g. extremely large class sizes, classes without classrooms, high pupil:teacher ratios and low per pupil expenditures) that might also result from high population growth and non variable supply inputs.

14/ For purposes of this exercise these growth ratios are projected through to 2000.

4.13 Participation ratios associated with the two different population growth projections vary little during the Seventh Plan period because most of the children who will reach primary school age during the Plan period are already born. By the year 2000, an early reduction in fertility could result in an enrollment ratio of almost 100%. If one includes private schools, the gross participation ratio would exceed 100% which suggests that most primary aged children would be in primary school. This would be a remarkable achievement for Pakistan. On the other hand, without fertility moderation, Pakistan will not achieve universal primary education until the 21st century. (Participation will be only 90% in 2000.)

4.14 Scenario 2: Target Participation Ratios. This case adopts a target gross participation ratio of 90% (in the public education system) for both male and female children by the year 2000. This target is considered to be quite realistic and is based on the same 7th Plan grade one enrollment growth assumed in Scenario 1. The objective in this scenario is to assess enrollment, classroom, teacher and budget associated with different rates of population growth. Higher population growth with a target participation ratio (of 90%) implies more children, more classrooms, and more teachers; with fixed unit costs, it implies more spending than with slower population growth. This is illustrated below (see also Table 4.2):

| | <u>7th Plan (1988-93)</u> | | <u>1990-2000</u> | |
|------------------------------------|---------------------------|---------|------------------|---------|
| | high | low | high | low |
| (population projections) | | | | |
| <u>Additional:</u> | | | | |
| primary enrollment | 3.4m | 2.9m | 10.5m | 8.7m |
| classrooms | 130,000 | 120,000 | 441,000 | 408,000 |
| teachers | 145,000 | 134,000 | 520,000 | 454,000 |
| recurrent cost (Rs m) | 24,270 | 23,790 | 85,160 | 79,450 |
| development cost (Rs m) | 6,930 | 6,420 | 24,890 | 21,780 |
| total cost | 31,200 | 30,210 | 110,050 | 101,230 |
| total real cost growth (% p.a.) | 9% | 8% | 9% | 8% |

4.14 According to these estimates, during the decade 1990-2000 GOP will have to provide 33,000 more classrooms, train 66,000 more teachers at the cost of Rs 9 billion (or twice 1986 spending) to provide primary school places for the additional children born under the higher population growth projection. Although not large compared with total needs this would place additional strain on the system's ability to build classrooms, train teachers, and administer an already over-extended system. 15/ The cost of primary education under conditions of high population growth is estimated to rise from an additional Rs 2.5 billion in 2000 to an additional Rs 5.4 billion in 2010 and Rs 10 billion in 2025. These estimates are conservative and make no provision for improving quality in primary education. Unit costs of Rs 740 per pupil (\$45) throughout could realistically be increased 50% or more.

15/ Total needs are great because of the rapid move from the current enrollment ratio of 53% to 90%.

TABLE 4.2: COMPARISON OF PRIMARY ENROLLMENT GROWTH, CLASSROOM, TEACHER AND BUDGET NEEDS FOR HIGH AND LOW POPULATION GROWTH ASSUMING TARGET PARTICIPATION RATIO.

| | 1988 | | 1990 | | 1993 | | 1995 | | 2000 | | 1988-93 | | 1990-2000 | |
|---|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|-----------|---------|-----------|---------|
| | high | low | high | low | high | low |
| Target Participation ratio (male and female) /1 | | | | | | | | | 90% | 90% | | | | |
| Grade One enrollment growth (average % p.a.) | | | | | | | | | | | | | | |
| male | 5.5 | 4.5 | 5.5 | 4.5 | 5.5 | 4.5 | 5.5 | 4.5 | 5.5 | 4.5 | 5.5 | 4.5 | 5.5 | 4.5 |
| female | 9.0 | 8.3 | 9.0 | 8.3 | 9.0 | 8.3 | 9.0 | 8.3 | 9.0 | 8.3 | 9.0 | 8.3 | 9.0 | 8.3 |
| Primary enrollment: (.000) | | | | | | | | | | | | | | |
| male | 5,166 | 5,152 | 5,558 | 5,475 | 6,679 | 6,386 | 7,557 | 7,072 | 10,294 | 9,122 | 1,513 | 1,234 | 4,736 | 3,647 |
| female | 2,973 | 2,943 | 3,621 | 3,542 | 4,835 | 4,632 | 5,846 | 5,523 | 9,398 | 8,573 | 1,862 | 1,689 | 5,777 | 5,031 |
| total | 8,139 | 8,095 | 9,179 | 9,017 | 11,514 | 11,018 | 13,403 | 12,595 | 19,692 | 17,695 | 3,375 | 2,923 | 10,513 | 8,678 |
| Total classrooms needed | 203,469 | 202,388 | 229,483 | 225,439 | 287,830 | 275,467 | 335,078 | 314,868 | 492,281 | 442,394 | 130,648/2 | 120,750 | 441,273 | 408,324 |
| Total teachers needed | 232,536 | 231,301 | 262,266 | 257,644 | 328,948 | 314,819 | 382,946 | 359,850 | 562,607 | 505,594 | 145,164/4 | 134,351 | 519,535 | 453,500 |
| Recurrent cost/3 (Rs millions) | 4,204 | 4,182 | 4,780 | 4,695 | 6,211 | 5,944 | 7,698 | 7,233 | 11,309 | 10,163 | 24,266/5 | 23,787 | 85,158 | 79,445 |
| Development cost/3. | 1,039 | 997 | 1,440 | 1,339 | 1,866 | 1,668 | 2,190 | 1,924 | 3,286 | 2,774 | 6,927/5 | 6,415 | 24,892 | 21,781 |
| Total cost/3 | 5,243 | 5,179 | 6,220 | 6,034 | 8,077 | 7,612 | 9,888 | 9,157 | 14,595 | 12,937 | 31,193/5 | 30,202 | 110,050 | 101,226 |
| Increase in Total Cost (percent p.a.) | 6.0 | 5.4 | 8.9 | 7.9 | 9.1 | 8.1 | 10.6 | 9.7 | 8.1 | 7.2 | 9.0 | 8.0 | 8.9 | 7.9 |

Notes:

1. Public system only. With addition of private school enrollment participation ratio (gross) would approach 100% in year 2000.
2. Addition classrooms needed during period.
3. Constant 1987 prices.
4. Additional teachers needed during period (including for wastage).
5. Total outlay needed during period.

Source:

Bank estimates

Total Public Cost of Education

4.15 On the basis of the (above) enrollment-finance model for primary education, very crude estimates of the cost of the entire education system can be made. The estimates assume that the growing number of primary aged children will lead to more secondary and tertiary enrollments, and that progression ratios from one level of education to the next will remain largely constant. They further assume that the costs of different education levels retain the same relationship to each other. In this way the cost of primary education will remain at about 30% of the cost of the total public education system. 16/ Table 4.3 presents the results of this exercise. Points of note from the Table are as follows:

- * By 1993 the public education system will cost GOP Rs 25-27 billion annually (about 12% of total expenditure); by 2000 this figure will be Rs 43-49 billion, depending on the rate of population growth (13-14% of total expenditure). These figures compare with a current annual outlay of Rs 16.7 billion (almost 10% of total government expenditure);
- * During the Seventh Plan period total public expenditure on education will be around Rs 100 billion, with investment needs at around Rs 22 billion and associated recurrent costs at Rs 80 billion. These levels of outlay suggest more education spending relative to total spending;
- * During the 7th Plan period GOP could save about Rs 3.3 billion if the birth rate declined immediately; during 1990-2000 the saving would grow to Rs 30 billion or about one percent of projected total government expenditure and 0.25% of GNP. These savings could be used to improve education quality;
- * Public expenditure on education is projected to rise from 2.4% of GNP to 3.1% in 1993 and to 3.3-3.7% in 2000. These increases are still modest; other developing countries are spending more.

4.16 The financial requirements of the public education system for both population projections exceed projected growth in total government spending in terms of annual growth. The situation during the 7th Plan years will remain difficult owing to the need for a tight budget and the need to make up for past underinvestment in education infrastructure. Recurrent expenditure will be especially tight, which will have serious implications for education quality. Beyond 1993 the situation could ease somewhat if population growth declines and revenue raising measures are successful. Nonetheless, limiting the budget deficit to 4.8% of GDP together with continued pressure for more

16/ The assumption that primary education consumes 30% of the education budget is based on evidence of expenditures for the past few years.

TABLE 4.3: PROJECTED TOTAL DEVELOPMENT AND RECURRENT COST OF EDUCATION, BY LOW AND HIGH POPULATION GROWTH RATES, 1988-2000

| | 1988 | | 1990 | | 1993 | | 1995 | | 2000 | | 1988-93 | | 1990-2000 | |
|--|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|---------|-----------|---------|
| | high | low | high | low | high | low |
| Total Recurrent cost/1 (Rs millions) | 14,013 | 13,940 | 15,933 | 15,560 | 20,703 | 19,813 | 25,060 | 24,110 | 37,697 | 33,877 | 80,887 | 79,290 | 283,860 | 264,817 |
| Total Development cost/1 (Rs millions) | 3,463 | 3,323 | 4,800 | 4,463 | 6,220 | 5,560 | 7,300 | 6,413 | 10,953 | 9,247 | 23,090 | 21,383 | 82,973 | 72,603 |
| Total Education cost/1 (Rs millions) | 17,477 | 17,263 | 20,733 | 20,113 | 26,923 | 25,373 | 32,960 | 30,523 | 48,650 | 43,123 | 103,977 | 100,673 | 366,833 | 337,420 |
| Projected annual increase in: | | | | | | | | | | | | | | |
| Total education cost: | 6.0 | 5.4 | 8.9 | 7.9 | 9.1 | 8.1 | 10.6 | 9.7 | 8.1 | 7.2 | 9.0 | 8.0 | 8.9 | 7.9 |
| Total expenditure on education as % of /2 | | | | | | | | | | | | | | |
| Total government expenditure: /3 | 10.5 | 10.4 | 11.9 | 11.6 | 12.3 | 11.6 | 13.1 | 12.2 | 14.1 | 12.5 | | | | |
| GNP: /4 | 2.8 | 2.8 | 3.0 | 2.9 | 3.3 | 3.1 | 3.5 | 3.3 | 3.7 | 3.3 | | | | |

Notes:

1. Constant 1987 prices
2. Figures for 1987 are 9.6% and 2.4% respectively.
3. Estimated to grow at 5.8% p.a. between 1988-1993, and 6.7% p.a. 1993-2000.
4. Estimated to grow at 5.0% p.a. between 198-1991, and 7.0% p.a. thereafter.

Source:

Bank estimates.

education spending education will present GOP with some difficult choices:
Should it

1. Extend the date for achieving universal primary education?
2. Spread available resources thinner over more children and accept lower per pupil expenditures, higher pupil/teacher ratios etc.?
3. Increase education spending at the expense of other sectors?
4. Raise revenues - and user fees - beyond current plans?
5. Encourage more private education at all levels? or
6. Accept a larger fiscal deficit?

HEALTH

Current Position and Recent Trends

4.17 Health indicators in Pakistan still lag behind those of most comparable countries (WDR, 1988). Infant mortality is high; average female life expectancy is low even by South Asian standards. Most diseases in Pakistan could be prevented by (i) an appropriate health care system, (ii) improved nutrition and hygiene, (iii) safe water and improved sanitation, and (iv) an effective child spacing program as an integral part of a maternal and child health (MCH) service. As in many developing countries, Pakistan's health services are urban and curative biased. 17/ In part, this reflects the dominant role of private health care. Some unusual features of public health in Pakistan are:

- * Family planning (or child spacing) is not generally offered as a health service. This responsibility is left to a separate agency, the Population Welfare Department.
- * Pakistan's health system is top-heavy with physicians. Doctors outnumber other paramedical personnel by 2 or 3 doctors to one. This situation is reversed in most countries.
- * Female staff are rare throughout the medical profession.

4.18 Public health facilities include large urban hospitals, Rural Health Centers (RHC) and rural Basic Health Units (BHU). Despite recent progress, the quality of the rural health service remains low because of inadequate staffing, lack of medicines and equipment, and poor out-reach

17/ For example, as estimated 80% of hospital beds and doctors are located in urban areas.

programs. 18/ At the same time, urban public health facilities are often overcrowded. Not surprisingly utilization of public health facilities is generally low; villagers and city dwellers alike prefer private physicians or traditional medical practitioners, or go untreated. Visits to private practitioners are far more frequent (especially in urban areas) than attendance at public health facilities 19/ despite much higher costs. Table 4.4 has details of the numbers of facilities and medical personnel and the ratio to population.

4.19 Finance. The private sector is the largest provider of health care in Pakistan, and spends the most money. While combined public and private expenditure on health care in Pakistan is not low (3.5% of GNP), public expenditure on health, especially recurrent expenditure, is very low (barely 1% of GNP compared with 3.5% in reference group countries). The private sector accounts for about 65% of health care spending and over 75% of recurrent expenditure. Government, on the other hand, dominates health sector investment. Public health visits are virtually free (mean cost of only one or two rupees). 20/ But visiting a private practitioner costs Rs 50, a private hospital Rs 65, and a Traditional Healer Rs 30. Average spending on health care is about Rs 165 per month per household, or 6% of monthly household expenditure. 21/

18/ Under the (former) Prime Minister's Program and with a budget allocation of Rs 5.7 billion over a four year period (1986-1990), a BHU in each Union Council and a RHC in each group of 4-5 Union Councils were planned. The plan provided for BHUs to be fully equipped and staffed to be able to deliver basic preventative and curative health services (including MCH services) and to undertake simple diagnostic laboratory work. RHCs, on the other hand, were to have up to 25 beds, an operating theater, a well equipped laboratory and a mobile health service. By the end of the Sixth Plan period (July 1988) an estimated 85% of Union Councils had been provided with either a BHU or RHC.

19/ In the three month period Feb-May 1987, almost 40% of all visits to all types of health care facilities (including Chemist and traditional healers) were to a Private Practitioner while only 20% were to a public health facility. Comparative figures for rural and urban areas are 34% private, 24% public in rural areas and 41% private, 15% public in urban areas. Source: Health Financing Report.

20/ Overall, an estimated 5.5% of the recurrent outlay on the public health service is recovered through user charges.

21/ Income elasticity of total household expenditure on health care is estimated to be in the range of 1.26 - 1.62 depending on place of residence.

TABLE 4.4: SIXTH, SEVENTH AND PERSPECTIVE PLAN TARGETS FOR HEALTH FACILITIES AND MANPOWER

| | Beginning of Sixth Plan (actual) | | End of Sixth Plan (projected) | | Seventh Plan targets (Plan end) | Perspective Plan targets (year 2006) |
|----------------------|-------------------------------------|---------------|----------------------------------|---------------|------------------------------------|---|
| | number | ratio to pop. | number | ratio to pop. | ratio to pop. | ratio to pop. |
| Basic health units | 1,715 | 1:52,600 | 3,496 | 1:30,060 |] one per union council/3 | 1:10,000 |
| Rural health centers | 374 | 1:241,217 | 492 | 1:213,615 |] | 1:50,000 |
| Tehsil hospital | | |] | | | 1:380,000 |
| District Hospital | | |] | 682 1:154,000 | | 1:1,160,000 |
| Hospital beds | 51,400 | 1:1,755 | 63,619 | 1:1,652 | | 1:1,000 |
| Doctors/2 | 16,500 | 1:5,468 | 36,000 | 1:2,920 | 1:2,200 | 1:1,500 |
| Nurses | 5,530 | 1:16,314 | 10,000 | 1:10,510 | 1:5,000 | 1:4,000 |
| Paramedics | 22,634 | 1:3,986 | | | 1:2,000 | 1:1,000 |
| TBAs/Dais | 4,705 | 1:19,175 | 45,000 | 1:2,335 | 1:1,000 | 1:1,000 |

Notes:

1. Private sector facilities and personnel included.
2. Includes specialist doctors and dentists.
3. Target of Prime Minister's Program for 1990. Thereafter emphasis will shift to adequate coverage of urban areas.
4. All hospitals.

Source:

Sixth Five Year Plan; Report of the Working Groups on Seventh and Perspective Plans.

Projected Health Service Needs

4.20 The health sector's Perspective Plan spans the years 1986-2006 and includes the following strategies and priorities: (i) comprehensive primary health care (including MCH and child spacing) with appropriate secondary and tertiary referral systems; (ii) comprehensive immunization of babies, young children, and women of child bearing age; (iii) health information and education programs; and (iv) an appropriate drug policy. The Perspective Plan sets the ambitious expenditure target of 6% of GNP for combined public and private expenditure on health care by the year 2006 (from the current 3.5%). The Plan calls for 6% of development expenditure on public health (FY88 allocation was actually 6.9%) and 5% of recurrent expenditure (2.8% in FY88). The Seventh five-year Plan reflects the overall priorities of the Perspective Plan and establishes intermediate targets for health facilities and manpower. (See Table 4.4). These targets are comparable with what other similar income countries have already achieved, except the target for doctors which is higher.

4.21 Because public health facility and manpower targets in Pakistan are based on population per facility (or health worker), high population growth will obviously increase the required number. 22/ (Table 4.5) For example, the difference between high and low population growth amounts to 750 BHUs, 150 RHCs, 9,000 hospital beds, 5,900 doctors, and 2,500 nurses (about 6.5% of the higher total). More than one million additional children will need to be immunized in the year 2000 assuming high population growth. Differences between high and low population projections increases rapidly after the turn of the century. By 2025, for example, the number of children to be immunized would be 3.2 million greater.

4.22 Projections to estimate health service costs associated with different population growth rates are presented in Table 4.6 -- these cost estimates refer to only the public health service. The projections use best guestimates about facility development and recurrent costs and projected demand. Although a 25% allowance is made for replacement facilities in the development budget and for vertical and other non-specified programs in the recurrent budget, these allowances are very conservative, especially on the recurrent side.

22/ One of the shortcomings of this particular approach in projecting health service needs is the implicit assumption that the health care needs of a population are homogenous. This is clearly not the case: the health care needs of pregnant women, babies, children, prime aged adults and elderly people are all quite different in terms of health facilities, health personnel and other inputs - costs also differ. One of the important outcomes of different rates of population growth is the resultant structure of the population (see Chapter 2, para. 2.37 and Table 2.4). Unfortunately for Pakistan, data prevent such a detailed analysis of the relationship between different rates of population growth and different types of health care needs.

TABLE 4.5: PROJECTED DEMAND FOR HEALTH FACILITIES AND MANPOWER, HIGH AND LOW POPULATION SCENARIOS

| | 1988 | 1993 | | 2000 | | 2010 | | 2025 | | Differences between high and low projections | | |
|---|---------|---------|---------|---------|---------|---------|---------|---------|---------|--|--------|--------|
| | Stock | HIGH | LOW | HIGH | LOW | HIGH | LOW | HIGH | LOW | 1993 | 2000 | 2025 |
| Total Population (,000) | 105,190 | 122,096 | 118,260 | 151,293 | 140,001 | 202,882 | 174,906 | 295,409 | 226,734 | 3,836 | 11,292 | 68,675 |
| 0-4 year olds | 19,161 | 21,952 | 19,626 | 25,899 | 20,290 | 32,490 | 22,903 | 37,995 | 22,224 | 2,326 | 5,609 | 15,771 |
| NUMBER OF FACILITIES/MANPOWER REQUIRED | | | | | | | | | | | | |
| Basic Health Units/1 | 3,496 | 6,105 | 5,913 | 10,086 | 9,333 | 20,288 | 17,491 | 29,540 | 22,673 | 192 | 753 | 6,867 |
| Rural Health Centers/2 | 492 | 1,221 | 1,183 | 2,017 | 1,867 | 4,058 | 3,498 | 5,908 | 4,535 | 38 | 150 | 1,373 |
| Hospital Beds/3 | 63,619 | 81,397 | 78,840 | 121,034 | 112,001 | 202,882 | 174,906 | 295,409 | 226,734 | 2,557 | 9,033 | 68,675 |
| Doctors/4 | 36,000 | 55,498 | 53,755 | 79,628 | 73,685 | 135,255 | 116,604 | 196,940 | 151,156 | 1,744 | 5,943 | 45,784 |
| Nurses/5 | 10,000 | 24,419 | 23,652 | 33,621 | 31,111 | 50,720 | 43,727 | 73,852 | 56,684 | 767 | 2,510 | 17,168 |
| Immunizations (,000)/6 | 2,875 | 4,390 | 3,925 | 5,180 | 4,058 | 6,498 | 4,581 | 7,500 | 4,445 | 465 | 1,122 | 3,155 |

- Notes:**
- 1:20,000 in 1993; 1:15,000 in 2000; 1:10,000 thereafter.
 - 1:170,000 in 1993; 1:75,000 in 2000; 1:50,000 thereafter.
 - 1:1,500 in 1993; 1:1,250 in 2000; 1:1,000 thereafter.
 - 1:2,200 in 1993; 1:1,900 in 2000; 1:1,500 thereafter.
 - 1:5,000 in 1993; 1:4,500 in 2000; 1:4,000 thereafter.
 - Actual estimate for 1988. From 1993, assumption is that 20% of 0-4 age groups immunized annually.

Source:
Bank estimates.

1
65
1

TABLE 4.6: PROJECTED DEVELOPMENT AND RECURRENT COSTS OF BASIC PUBLIC HEALTH SERVICE
(millions 1987 Rupees)

| | Unit Costs | (Annual Development Cost) | | | | | | Unit Costs | (Annual Recurrent Costs) | | | | | |
|---|------------|---------------------------|-------|-----------|-------|-----------|-------|------------|--------------------------|-------|-------|-------|--------|--------|
| | | 1988-93 | | 1993-2000 | | 2000-2010 | | | 1993 | | 2000 | | 2010 | |
| | | HIGH | LOW | HIGH | LOW | HIGH | LOW | | HIGH | LOW | HIGH | LOW | HIGH | LOW |
| Basic Health Units | 2.1 | 1,056 | 1,015 | 1,194 | 1,436 | 2,142 | 1,713 | 0.200 | 1,221 | 1,183 | 2,017 | 1,866 | 4,058 | 3,498 |
| Rural Health Centers/ ¹ | 10.0 | 1,458 | 1,382 | 1,107 | 977 | 2,041 | 1,631 | 0.510 | 622 | 603 | 1,029 | 952 | 2,069 | 1,784 |
| Hospitals (beds) | 0.6 | 2,158 | 1,848 | 3,324 | 2,875 | 4,968 | 3,818 | 0.024 | 1,953 | 1,892 | 2,905 | 2,688 | 4,869 | 4,198 |
| Immunization Program | | | | | | | | 0.055 | 241 | 216 | 285 | 223 | 418 | 252 |
| All Programs: annual average / ² | | 5,890 | 5,306 | 7,031 | 6,610 | 11,440 | 8,953 | | 5,046 | 4,868 | 7,795 | 7,161 | 13,893 | 12,165 |

Summary Annual Costs

| | 1987/8 / ³ | 1993 | | 2000 | | 2010 | |
|--|-----------------------|--------|--------|--------|--------|--------|--------|
| | | HIGH | LOW | HIGH | LOW | HIGH | LOW |
| Development costs | 3,114 | 5,890 | 5,306 | 7,031 | 6,610 | 11,440 | 8,953 |
| Recurrent costs | 3,600 | 5,046 | 4,868 | 7,795 | 7,161 | 13,893 | 12,165 |
| Total Costs | 6,714 | 10,936 | 10,174 | 14,826 | 13,771 | 25,333 | 21,118 |
| As % of projected government expenditure | 3.9% | 5.0% | 4.6% | 4.3% | 3.8% | 4.2% | 3.5% |
| As % of projected GNP | 1.1% | 1.2% | 1.1% | 1.1% | 1.0% | | |

Notes:

1. Includes urban facilities
2. Column total plus 25% allowance for replacement facilities and other non-specified programs.
3. Actuals.

Source:

Financing and Expenditure Study, GOP/INETA/UCL, Draft Final Report, Sept 1987
Lee, K. "A Report of Health Financing Missions", July 1985.
Mission estimates

4.23 With these qualifications in mind, the following propositions deserve attention:

- * Health sector spending was 6.8% of development expenditure in 1988. It will need to increase to 7.9 - 8.8% in 1993 and to 7.5 - 8.9% in 2000. During the same period, associated recurrent expenditure will need to rise from 2.8% of total recurrent expenditure to 3.0% - 3.2% in 2000, depending on the rate of population growth. These figures differ from those established under the Perspective Plan (para. 4.20).
- * The savings associated with lower population growth amount to a modest 0.4%, 0.5%, and 0.7% of projected government expenditure in the years 1993, 2000, and 2010. These amounts represent no more than 0.1% of GNP.

4.24 The above calculations explicitly assume that the private sector will continue as the principal provider of curative health care, particularly in cities, so the impact of differential population growth on the government health budget is surprisingly modest. At present, the private sector accounts for almost double the public outlay on health. If the government elects to raise the public health service's profile vis-a-vis the private sector, the impact on the public purse would be dramatic.

URBAN DEVELOPMENT

Urbanization and Population Growth

4.25 This section illustrates how different rates of population growth affect urban infrastructure, shelter and urban service needs of the population. Pakistan's urban population has grown rapidly since independence (para. 2.05, Table 2.2 and Annex 5, Table 7), partly due to high urban fertility and partly because of rural-urban migration. This reflects a slow but continuous decline in the economic contribution of agriculture and an increase in importance of industry and services, which are primarily urban-based. Urban growth is a natural and essential part of any country's progressive economic transformation but growing cities require enormous investments by public and private sectors in all types of urban infrastructure (roads, water supply, sewerage, storm drainage); community facilities and housing; commercial and industrial buildings and equipment. Costs are typically higher than they would be in a rural setting, but failure to invest in effective and affordable urban programs can cause widespread misery. On the other hand, cities also generate large amounts of wealth because of (i) economies of scale, (ii) reduced transaction costs from more efficient communications, and (iii) from agglomerating interdependent activities. They also offer larger, more competitive markets for legal and financial services, for labor, and for goods. This wealth can be mobilized to help meet the costs of urbanization.

Past Urban Growth

4.26 Shelter and serviced plot construction has not kept pace with past urban population growth. For example, housing census data indicate that housing conditions are growing worse: urban housing stock increased 3.7% annually during 1960-81 while population increased 4.4%. The average number of persons per urban housing unit increased from 4.9 in 1960 to 6.6 in 1980. The growth of katchi abadis or unplanned urban squatter settlements is a further indication of the growing urban problem. Karachi's squatter population has been growing at roughly 200,000 annually, twice as fast as Karachi's total population. Over 2 million people (37% of Karachi's inhabitants) live in katchi abadis. The katchi abadi population of other cities is estimated at about 25%. Most katchi abadis lack basic infrastructure, services, or community facilities. Many cities contain large areas of sub-standard and poorly serviced housing which occupies land legally but are otherwise similar to katchi abadis. Densification and deterioration pose additional problems for inner city housing where rent control has removed landlord incentives to maintain the housing stock.

4.27 Although it remains poor (see Annex 5, Table 6) Pakistan's urban population has comparable or better access to safe water and excreta disposal than other Asian low income countries. Twenty five percent of Karachi households have individual piped water connections (and waterborne sewerage); the water needs of the remainder are served by standpipes at a ratio of one per 300 persons. In Punjab where groundwater is plentiful, water consumption in urban areas is high. In Lahore, 70% of the population is connected to the public piped water system and about 90% of the population has access to public sewerage disposal systems, although over half of this is through open channels presenting a major health hazard. In smaller Punjab cities 25-50% of the population has access to piped water.

4.28 Making Up Existing Deficits Just as with education and health services, Pakistan is facing a rapidly growing urban population from a position of existing shortfalls in urban infrastructure and housing. But numerous estimates of housing "shortages" are hard to verify since most urban dwellers have some form of shelter, however poor. Often such estimates imply an unaffordable standard. A minimum program is the present katchi abadi upgrading program which seeks to increase potable water supply, improve sanitation and drainage channels, widen roads and provide walkways, solid waste disposal, house-to-house electrification and street lighting, and provide basic community facilities (such as schools, health centers). The cost of upgrading all katchi abadi infrastructure (but not houses 23/) is estimated at almost Rs 17 billion (Rs 12 billion for the major cities.) The (former) Five Point Program set aside Rs 3.5 billion for improving and developing katchi abadis for 1986-90. Although not precisely matched, these figures illustrate that current investment falls far short of needs.

23/ Although provision of housing is not typically a component of katchi abadi upgrading, the granting of tenure and the provision of credit for house improvement are central objectives.

Projected Urban Population

4.29 On the basis of historical trends and the experience of other countries, Pakistan's urban areas probably will continue to grow faster than rural areas. Although the rate of natural population increase may decline faster in urban areas, rural-urban migration will continue to swell the urban population. Past urban growth rates have varied somewhat with settlement size (Annex 5, Table 7) and this trend is expected to continue. Projected annual growth rates for 1985-2025 in metropolitan, secondary, and other cities range from 1.0-1.6% above the rate of natural increase (shown in Table 2.8). 24/ Regardless of the pace of population growth the projections suggest that 36% of Pakistan's people will live in cities in 2000 and 50% in 2025 (from 30% in 1988).

4.30 Assuming high population growth the projected urban growth rate is projected at 4.3% annually until 2000, falling to 4.1% through to 2025. This projection implies an urban population of 54 million in 2000 -- that is almost double the current urban population -- and 148 million in 2025 (Table 4.7). Assuming lower overall population growth, the urban population will increase 3.8% annually until 2000 and 3.3% thereafter. Under this projection, the urban population will be 50 million in 2000 and 113 million in 2025 - differences of 4 million people in 2000, and 35 million in 2025 from the higher growth scenario.

4.31 Projected Costs of Urbanization. On the basis of the estimated costs (all converted to per capita) of providing urban infrastructure and services and projected urban populations, the costs of urbanization have been calculated. These are presented in Tables 4.8 and 4.9. 25/ While Table 4.8 projects total costs, Table 4.9 projects public sector costs. 26/ According to these estimates, with sustained high population growth and an urban population approaching 54 million in 2000, the annual investment

24/ Karachi is treated somewhat differently and beyond 2000 it is assumed that Karachi will grow at the national average rate of natural increase.

25/ Making even a rough cost estimate of accommodating additional urban population in coming years involves several assumptions about coverage of urba. infrastructure and standards. For coverage it is assumed that one hundred percent of urban residents is provided for with basic infrastructure, community facilities and housing. Estimates of costs by city size vary (Annex 5, Table 8): they are rough, but elements of the cost have been cross-checked with more recent cost estimates or actual costs where available and are broadly consistent.

26/ The assumption here is that the private sector would be responsible for the cost of land and housing; the public sector, on the other hand, would provide on-sight and trunk infrastructure and community facilities.

TABLE 4.7: PROJECTED URBAN POPULATION TO YEAR 2025, HIGH AND LOW ESTIMATES

(mid year estimates; ,000)

| | 1985 | 2000 | | 2025 | |
|---------------------------------|--------|---------|---------|---------|---------|
| | | high | low | high | low |
| Metropolitan cities | 9,700 | 17,429 | 16,128 | 44,312 | 34,010 |
| (Karachi) | 6,296 | 11,190 | 10,468 | 22,127 | 16,760 |
| (Lahore) | 3,404 | 6,052 | 5,660 | 22,184 | 17,250 |
| (Other) | | | | | |
| Secondary Cities | 6,870 | 13,616 | 12,600 | 38,403 | 29,475 |
| Other Cities | 12,135 | 23,420 | 21,672 | 64,990 | 49,881 |
| Urban Total | 28,705 | 53,881 | 50,400 | 147,705 | 113,367 |
| Total population | 96,180 | 151,293 | 140,000 | 295,409 | 226,734 |
| Percent urban | 30 | 36 | 36 | 50 | 50 |
| Urban growth rate (% p.a.) | | 4.3 | 3.8 | 4.1 | 3.3 |
| Population growth rate (% p.a.) | | 3.0 | 2.5 | 2.7 | 1.9 |

Note:

Urban growth rate calculated as follows:

Metropolitan cities: rate of natural increase plus 1.0% p.a; Karachi at national average

rate of natural increase after 2000.

Secondary cities: plus 1.59% p.a.

Other cities: plus 1.41% p.a.

Source:

Bank estimates.

1
0
1

TABLE 4.8: PROJECTED TOTAL (PUBLIC AND PRIVATE) COST OF URBAN GROWTH, WITH VARYING STANDARDS OF INFRASTRUCTURE COST AND POPULATION GROWTH RATE

(million rupees; 1987 prices)

| | 1985 - 2000 | | 2000-2025 | |
|--------------------------------------|----------------|----------------|----------------|----------------|
| | high | low | high | low |
| NHSPS LOW COST | | | | |
| Metropolitan cities | 243,597 | 207,508 | 835,708 | 546,710 |
| (Karachi) | 167,864 | 143,100 | 375,139 | 215,816 |
| (Lahore) | 75,733 | 64,409 | 460,569 | 330,895 |
| (Other) | | | | |
| Secondary cities | 136,614 | 116,033 | 501,933 | 341,727 |
| Other Cities | 275,358 | 232,703 | 1,014,308 | 688,311 |
| Urban total | 655,569 | 556,244 | 2,351,949 | 1,576,748 |
| Average annual outlay as % of GNP | 43,705 4.7% | 37,083 4.0% | 94,078 4.9% | 63,070 3.6% |
| ALTERNATIVE STANDARD | | | | |
| Metropolitan cities | 126,488 | 107,808 | 430,780 | 281,311 |
| (Karachi) | 88,092 | 75,096 | 196,866 | 113,256 |
| (Lahore) | 38,396 | 32,712 | 233,914 | 168,055 |
| (Other) | | | | |
| Secondary cities | 70,837 | 60,165 | 260,261 | 177,192 |
| Other Cities | 103,259 | 87,264 | 380,354 | 258,117 |
| Urban total | 300,584 | 255,237 | 1,071,400 | 716,620 |
| Average annual outlay as % of GNP | 20,039 2.2% | 17,016 1.8% | 42,856 2.5% | 28,665 1.6% |

Note:

1. Population projections from Table 4.10 and infrastructure costs from Table 4.11.

Source:

Bank estimates

TABLE 4.9: PROJECTED PUBLIC COST OF URBAN GROWTH, WITH VARYING STANDARDS OF INFRASTRUCTURE COST AND POPULATION GROWTH RATE

(million rupees; 1987 prices)

| | 1985 - 2000 | | 2000-2025 | |
|---|---------------|---------------|-----------|---------|
| | high | low | high | low |
| NHSPS LOW COST | | | | |
| Metropolitan cities | 91,963 | 78,384 | 290,295 | 186,173 |
| (Karachi) | 69,984 | 59,660 | 156,399 | 89,976 |
| (Lahore) | 21,978 | 18,725 | 133,896 | 96,197 |
| (Other) | | | | |
| Secondary cities | 37,105 | 31,515 | 136,327 | 92,815 |
| Other Cities | 126,394 | 106,814 | 465,582 | 315,946 |
| Urban total | 255,461 | 216,714 | 892,204 | 594,934 |
| Average annual outlay as % of total public invt. | 17,031 18% | 14,448 15% | 35,688 | 23,797 |
| LOWER STANDARDS | | | | |
| Metropolitan cities | 48,621 | 41,442 | 154,622 | 99,345 |
| (Karachi) | 36,705 | 31,290 | 82,028 | 47,190 |
| (Lahore) | 11,916 | 10,152 | 72,594 | 52,155 |
| (Other) | | | | |
| Secondary cities | 20,239 | 17,190 | 74,360 | 50,626 |
| Other Cities | 28,213 | 22,843 | 103,925 | 70,524 |
| Urban total | 97,073 | 82,475 | 332,906 | 220,495 |
| Average annual outlay as % of total public invt. | 6,472 7% | 5,498 6% | 13,316 | 8,820 |

Note:

1. Population projections from Table 4.10 and Infrastructure costs from Table 4.11

Source:

Bank estimates

requirement for urban infrastructure until 2000 is around Rs 44 billion or about 4.7% of projected GNP. Beyond the turn of the century, annual investment needs rise to Rs 95 billion, about 5% of projected GNP. Assuming an early reduction in the fertility rate and a slowing of the urban population growth rate, annual investment needs would be Rs 37 billion to 2000 (4.0% of GNP) and Rs 63 billion thereafter (3.6% of GNP). 27/

4.32 The public sector will need to invest around Rs 17 billion per annum until the year 2000 and Rs 36 billion per annum thereafter under the high population growth projection for urban infrastructure and community facilities. The former figure represents 18% of projected total public investment during this period. This figure could fall to 15% with an early slowing of urban population growth rate.

4.33 These investment levels are far beyond what Pakistan has ever achieved and are probably beyond what Pakistan could achieve in the future. Assuming, therefore, that much urban development will be informal -- similar to upgraded katchi abadis or equivalent plotted developments -- alternative lower cost estimates reveal costs could be reduced by half (Tables 4.8, 4.9 and Annex 5, Table 8). 28/ With these alternative urban development standards and a decline in urban growth, investment needs fall to a more realistic 1.8% of GNP between now and 2000 and 1.6% thereafter. Should rapid population growth remain, equivalent figures would be 2.2% and 2.5%. For the public sector the level of outlay would be 6% of total investment with slower population growth and 7% if population growth does not decrease before the twenty first century.

27/ This assumes that the rate of GNP growth is exogenous to the rate of either total or urban population growth.

28/ The National Human Settlements Policy Study (NHSPS) undertaken in 1984 made unit cost estimates of urban growth based on various standards. The NHSPS standard selected for use in this report and discussed above is the low cost variant, adjusted to 1987 prices, with most of the financial cost of land removed. (The reason for removing much of the land cost is that a very high financial cost of land, especially in Karachi, was assumed by the NHSPS study. This is considered inappropriate since the opportunity cost to society of using it for urbanization is probably much less.) However, even this low cost variant appears unaffordable if applied across the board. An alternative standard to this, derived for purposes of this report, assumes less on-site development, less trunk infrastructure, lower cost community facilities and more modest standards of housing.

GROWING DEMAND FOR PUBLIC SERVICES

4.34 Budget implications. 29/ Sustained high population growth will mean that spending on urban infrastructure, housing, and education and health services will require an increasing share of total development spending, reaching 30% in 2000 from 27% at the present time (Table 4.10). After 2000, if the system has "caught-up" and stabilized, the total requirement falls to a more modest 26%, provided that revenues are buoyant. (Education continues to demand a rising share of total expenditure even under assumptions of revenue buoyancy.) Alternatively, lower population growth could be accommodated within the current development expenditure share (27%) through 2000 and could fall to around 20% thereafter.

4.35 The recurrent budget is a different matter. Under both population projections, the education and health sectors 30/ require increasing shares of total recurrent expenditure to complement projected investments. With sustained high population growth, these sectors require an increase to 17% of the total (from 14%) in 1993 and 19% in 2000. Lower population growth calls for an increase to 16% in 1993 and 17% in 2000. After 2000, the benefits of moderated fertility become more apparent and these social services would no longer need to expand at the same pace. Recurrent expenditure growth could be moderated, although this would be an ideal opportunity to improve service quality.

4.36 The demands of high and more moderate population growth on total public sector spending differ by about 3.5% in the year 2000, almost one percent of GDP. By 2010, the difference would be about 5%, or 1.3% of GDP. The difference would continue to grow for some years thereafter.

29/ Costs associated with the two population projections are broken down into development and recurrent costs, and then compared with projected public expenditures. The latter are projected by a model which specifies them as a percentage of GDP. Revenues as a percentage of GDP are specified to rise throughout the projection period. Expenditures as a percentage of GDP are specified to fall in the early years of the projection period (to allow for a decline in the fiscal deficit) but rise again in the early 1990s, stabilizing around the mid-1990s. Both sets of projections - costs and expenditures - have many qualifications (the qualifications behind the cost projections for education, health and urban infrastructure are addressed in the respective sections above) and the figures presented in this section should be considered indicative rather than absolute (this is particularly so after 2000).

30/ Urban is not included here under the assumption that it will not make any net recurrent demands on the consolidated budget.

TABLE 4.10: SUMMARY PROJECTED PUBLIC SERVICE COSTS AND
PROJECTED PUBLIC FINANCE, WITH VARIABLE POPULATION GROWTH, 1988-2010

(Millions of 1987 rupees)

| | 1988 Actual | 1993 | | 2000 | | 2010 | |
|--|---------------------|--------|--------|--------|--------|--------|--------|
| | | High | Low | High | Low | High | Low |
| A. Development Costs: | | | | | | | |
| Education | 3,999 | 6,220 | 5,560 | 10,950 | 9,250 | 17,940 | 13,360 |
| Health | 3,114 | 5,890 | 5,310 | 6,990 | 6,100 | 11,440 | 8,950 |
| Urban ^{1/} | 6,000 ^{2/} | 6,470 | 5,500 | 13,320 | 8,820 | 13,320 | 8,820 |
| Total | 13,113 | 18,580 | 16,370 | 31,260 | 24,170 | 42,700 | 31,130 |
| As % Total development expenditure | 27.2 | 27.7 | 24.4 | 30.0 | 23.2 | 25.8 | 18.8 |
| B. Recurrent Costs ^{3/}: | | | | | | | |
| Education | 12,725 | 20,700 | 19,810 | 37,700 | 33,880 | 53,820 | 40,080 |
| Health | 3,600 | 5,050 | 4,870 | 7,790 | 7,160 | 13,890 | 12,170 |
| Total | 16,325 | 25,750 | 24,680 | 45,490 | 41,040 | 67,710 | 52,250 |
| As % Total recurrent expenditure | 13.9 | 16.9 | 16.2 | 18.9 | 17.1 | 17.6 | 13.6 |
| C. Government Revenues/GDP ^{4/}: | 17.6 | 21.5 | | 21.7 | | 21.7 | |
| Government Expenditures/GDP ^{4/} | 26.2 | 26.0 | | 26.4 | | 26.4 | |
| Fiscal Deficit/GDP ^{4/} | 8.6 | 4.7 | | 4.7 | | 4.7 | |
| Public Expenditures on Social Services & Infrastructure/GDP ^{5/} | 4.6 | 5.4 | 5.0 | 6.0 | 5.1 | 5.3 | 4.0 |

Notes:

^{1/} Alternative standard infrastructure, public cost only.

^{2/} Estimate.

^{3/} Assumes that urban infrastructure makes no net recurrent demands on the consolidated budget.

^{4/} Target.

^{5/} Total from (A) and (B) over projected GDP.

GDP projected at following rates: 1989-1991 5.5% p.a.
1992-2000 6.5% p.a.
2001-2010 5.0% p.a.

4.37 Other implications. The large and growing financial demands of urban infrastructure and social services associated with rapid population growth is not the only dimension of the problem. Implementation capacity is another major issue. But perhaps most difficult will be staffing social services with teachers and nurses, especially in rural areas. Education and health services require a high proportion of educated and trained female staff. Pakistan does not have enough women with post-primary education to fill all the teaching and nursing jobs it needs to create. The situation should ease as more girls pass through the education system, but continued rapid population growth will aggravate this imbalance because of the shape of the population pyramid and the dual role of women as mothers as well as workers.

Coping with Growing Demand for Public Services

4.38 The GOP currently faces a twin problem. On the one hand are the social service/urban infrastructure/shelter needs of the incremental population. On the other hand are the enormous shortcomings in service provision to today's population. Facing both problems at the same time presents a major challenge. Moreover, a short-run problem is the fiscal deficit and the need to rein in expenditure growth. In the longer run, assuming improvements in domestic resource mobilization, additional resources should be available for these sectors, although important questions of service quality still need to be addressed.

4.39 Several short, medium, and long term policy measures could bring the service and infrastructure needs of the population into closer balance with potential supply, and also contribute to improved service quality. The first is the central theme of this report: a lower birth rate and a lower rate of population growth. A lower birth rate today would affect the health system immediately as fewer and more healthy mothers and babies will require less health care. Five years hence fewer children would need primary schooling; ten years after that fewer children would need secondary education, and so on. In urban areas a lower birth rate would reduce the rate of urban growth directly and possibly indirectly (through migration), giving authorities the chance to improve infrastructure, shelter, and services. Slower increases in numbers of mothers, babies, children, and urban residents will help improve service and infrastructure quality at any given level of aggregate expenditure. 31/

4.40 Second is the much discussed issue of domestic resource mobilization. As discussed above, the investment and recurrent cost implications of a growing population are enormous. Although private institutions and individuals (see below) will finance a large part of needed investment, the state must continue to bear a major part of the burden. The present rate of domestic resource mobilization is low but it has tremendous scope for expansion, especially in agriculture and in the dynamic urban economy by increasing local taxes and charges. (For example, adding to the highly successful octroi tax, the property tax could generate considerable

31/ There may, of course be economies of scale which lower the per capita costs of providing a service or infrastructure.

revenues with a number of relatively minor changes. Rates and service charges for water, sanitation, and other urban services are underexploited as a revenue source.) At the federal level, ways to raise additional revenues have been widely discussed 32/ and beginning with the FY89 budget the Government has begun to carry out a substantial reform of the tax system. 33/

4.41 Direct cost recovery from beneficiaries in the form of user fees is another dimension of domestic resource mobilization and feasible for numerous public service activities. Plot charges could be set to help recover the cost of land and infrastructure in urban locations. Improved cost recovery is also possible in katchi abadis infrastructure schemes either by selling leases to occupants, or by taxing property or improvements. With minor variations and exceptions, public sector education is currently provided free or at nominal charge. University fees, at Rs 25-32 per month represent less than 10% of operating costs. On grounds of equity and efficiency they could be increased to 30% of total operating costs. But fees are not recommended for primary education since enrollment is low, especially for girls, and attendance has to be encouraged. The existence of a robust private health sector that serves the higher income groups partly fulfills the goal of cost recovery. But private/public initiatives, user charges for certain mainly curative health services, and many other initiatives will be needed to help finance Pakistan's social services and urban infrastructure. Although helpful, user charges in the social services are never going to generate large revenues. Investment and most operating costs will have to continue to come from general government revenue, ear-marked taxes, or local taxes.

4.42 Beside the two central issues of (i) reducing demand by reducing population growth and (ii) improving domestic resource mobilization to help finance services and infrastructure, the private sector can help ease pressure on the budget. In Pakistan, the private sector already plays an important role in the provision of urban services (e.g. transport and housing), in the health sector (despite its shortcomings of being curative and urban biased and beyond the financial reach of low income households) and a growing role in the provision of education. (At the primary level private schools may already account for as much as 10% of total enrollment.) The discussion above has assumed that the private sector will continue to bear the cost of land and housing, and a whole range of urban services representing up to 75% of the estimated investment cost. It is also assumed that the private sector will continue to play a major role in the provision of education and health services. This role could be further encouraged by government offering tax incentives and matching grants, for example. But private schools and private health facilities probably will never become widespread outside urban areas and high fees will restrict access to only those children from better off families.

32/ See, for example, World Bank (1988) "Pakistan: Growth Through Adjustment," Report No. 7118-PAK.

33/ The reform is designed to broaden the domestic tax base and make the tax system more equitable over the medium term, thereby increasing both its yield and its elasticity.

4.43 Finally, the issues of development standards and service efficiency deserve attention. Current standards for land use, infrastructure, and construction have generally been geared toward upper and middle income groups; they are not affordable by the poor. For example, building regulations have assumed that every family should have a "pucca" (permanent) house without regard to affordability; thus conventional housing in public development schemes has bypassed the poorer 50% of urban households. Population and fiscal pressures call for moderating urban standards. On the other hand, standards of infrastructure and service in the education and health sectors need to be raised. This can best be achieved by improved efficiency and by paying more attention to teacher:pupil ratios, numbers of support staff in schools, and the ratio of paramedical staff to doctors. Decentralization also has a role to play in service efficiency. No country the size and complexity of Pakistan can administer highly centralized social services efficiently, either financially or managerially. Prior to the 1972 nationalization of schools, local governments played a larger role in financing and administering primary and middle schools. This role needs to be restored to help mobilize local resources. Municipal bodies could also help manage schools, clinics, and hospitals. In urban areas, efficient service delivery is often undermined by fragmenting responsibility for urban service delivery among provincial agencies, development authorities and local governments. Better coordination is called for.

CHAPTER 5:

POPULATION GROWTH AND LABOR MARKETS

Introduction

5.01 The labor market is related to population growth because of the population's role as producers of goods and services, (that is, as factors of production) and their role as consumers. The size of the labor force depends directly on the size of the adult population, its age-sex composition, and labor force participation rates. Conversely, population growth (and income growth) increases demand for goods and services, and the demand for labor. These linkages between population and the labor market clearly imply that labor demand and supply together with the wage level, are jointly determined. This chapter reviews the structure and trends in labor supply and demand relating these to changes in wages and unemployment. These changes also have implications for the future; the latter part of this chapter discusses future prospects for size and structure of the labor force associated with the dynamics of Pakistan's projected population.

Labor Force: Structure and Growth 1/

5.02 Structure. Pakistan's labor force is primarily rural, male, illiterate, (or uneducated) and young. Reflecting the country's heavy dependence on agriculture, 80% of its labor force of 45 million resided in rural areas in 1984/85 (Table 5.1). 2/ While women participate extensively in agricultural work, under 5% of urban working age women were in the urban labor force. As a result, women workers accounted for no more than a third of the total labor force. (Official labor force statistics, which do not capture the extent of female workers in agriculture, show this proportion to be less than 10%.) Education indicators (literacy rates, school enrollment ratios) reveal that educational attainment for the population as a whole, and hence for the labor force, is particularly poor in Pakistan even compared with poorer and less developed countries (para. 4.06). Finally, rapid population growth over the last decade has resulted in a youthful labor force; about 20% of Pakistan's labor force are below age 20.

5.03 Trends. According to official Labor Force Surveys (LFSs), Pakistan's labor force grew 2.8% annually during 1972-81, from 19.5 million to nearly 30 million. (Table 5.2). Changes in the size of the economically active population have been a major source of labor force growth in Pakistan.3/

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- 1/ This section draws heavily on: World Bank: "Employment Issues in Pakistan," January 1989 (Report No. 7523-PAK).
 - 2/ These estimates have been adjusted for underestimation in official labor force statistics, and do not correspond to the latter.
 - 3/ In Pakistan, the economically active population is defined as the population aged between 10 and 64. The participation rate is derived as the proportion of the labor force either in the total population (the "crude" rate) or in the economically active population (the "refined" rate). Except where noted, the latter definition is used in this chapter.

TABLE 5.1: LABOR FORCE STRUCTURE IN PAKISTAN, 1986/87 a/

| | | Total | Male | Female |
|---|--------------|-------|------|--------|
| Labor Force (mil.) | Rural | 36.0 | 20.4 | 15.6 |
| | Urban | 9.1 | 8.7 | 0.4 |
| Age Distribution (%) <u>b/</u> | 10-14 | 8.0 | 7.2 | 13.3 |
| | 15-19 | 12.1 | 12.0 | 13.0 |
| | 20-24 | 13.5 | 13.7 | 11.9 |
| | 25-54 | 54.6 | 54.7 | 53.9 |
| | 55 and above | 11.8 | 12.4 | 7.9 |
| Educational Attainment (%) <u>c/</u> | Illiterate | 62.1 | 47.6 | 77.8 |
| | Literate | 37.9 | 52.4 | 22.2 |

Notes:

a/ Estimated from the Labor Force Survey (LFS), adjusted for underenumeration (see para.5.4).

b/ % of labor force, based on LFS.

c/ % of economically active population (population aged 10 and above), based on LFS.

TABLE 5.2: TRENDS IN POPULATION AND LABOR FORCE,
1971/72 - 1986/87 ^{a/}

| | Millions | | | % Increase p.a. | |
|---|--------------------|---------|---------|-----------------|-----------------|
| | 1972 | 1978/79 | 1986/87 | 1972-1978/79 | 1978/79-1986/87 |
| Population | 63.7 | 78.9 | 100.7 | 3.1 | 3.1 |
| Economically Active Population (EAP) ^{b/} | 41.9 | 53.1 | 67.3 | 3.4 | 3.0 |
| Labor Force | 19.5 | 24.5 | 29.6 | 3.3 | 2.4 |
| Employed | 19.1 | 23.7 | 28.7 | 3.1 | 2.4 |
| Unemployed | -0.4 | 0.86 | 0.9 | 11.6 | 0.7 |
| EAP/Population (%) | 65.7 | 67.3 | 66.8 | | |
| Labor Force Partici- pation Rate (%) ^{c/} | 46.6 ^{c/} | 46.1 | 44.0 | -0.2 | -0.6 |

Notes:

^{a/} Data for 1972 are from the Population Census, those for 1978/79 and 1986/87 are based on Labor Force Surveys.

^{b/} Population aged 10 to 64.

^{c/} Labor force as a percentage of economically active population.

^{d/} Based on the Household Economic and Demographic Survey 1973.

Sources: Population Census 1972; Labor Force Surveys, 1978/79 and 1986/87.

During 1971/72-1978/79, the economically active population grew from 41.9 million to 53.1 million, a 3.4% average annual increase, and considerably faster than population growth. As rapid population growth in the late 1970s added constantly to the lowest age cohorts, the growth rate of the economically active population fell below that of overall population increase, while its share of the total population also declined slightly (from 67.3% in 1978/79 to 66.8% in 1986/87). Rapid population growth also increased the share of the young in the economically active population during 1978-87; those aged 10-24 increased from an estimated 22.8 million to 30.7 million, and their share in the labor force increased from 43% to 46%. One element that held down Pakistan's labor force growth has been a falling labor force participation rate. This is explained by an increasing proportion of the population in the youngest age groups and rising literacy and school enrollment. In addition, rising out migration reduced the growth of the domestic labor force. With an estimated 1.7 to 2 million workers abroad, 4/ the domestic labor force would have grown over 3% annually during the 1970s had outmigration not occurred. From a trickle in the early 1970's, outmigration of Pakistanis to the Middle East rose to 170,000 workers per annum by around 1980/81.

5.04 Official labor force data, which is based on a short (1 week) reference period, significantly underestimated the size and annual increment of the labor force due to underreporting of female labor participation in the rural labor force.^{5/} While female participation rates have fluctuated from as low as 3% of women aged 10 and above (1981 Population Census) to around 12% (1978/79 LFS) (Table 5.3), the Agricultural Census of 1980 indicated that out of some 22.8 million "economically active" persons, 9.2 million, or 42%, were women, implying a participation rate of 74%.^{6/} Officially reported participation rates may also have been depressed by the failure of population censuses to include in the labor force males of working age whose economic activity status is unknown. Thus the 1981 Population Census showed that fewer

4/ For the period 1978/79-1981/82, estimates of the stock of migrants varied between 1.4 million and 2.5 million. A PIDE study gave a figure of 1.8 million for 1979, while the Population Census (10% count) estimated migrant stock to be 1.7 million in 1981. See ILO/ARTEP "Impact of Return Migration on Domestic Employment in Pakistan-A Preliminary Analysis", April 1984, Mimeo., p.11.

5/ For males, Pakistan's crude rate of 50% in 1985/86 compares with about 52% for South Asia, but for females, Pakistan's rate of 6% falls considerably short of South Asia's 23%. See World Bank: World Tables, 1983, Vol. II., Social Data, New York, 1983.

6/ The Agricultural Census used a 1 year reference period which captures more fully female labor force participation. However, the fact that most women (96%) worked within their own holdings, and were part-time workers (76%) clearly accounts for their omission from general labor force surveys. Micro-level studies of rural areas also show female participation in farming activities to be substantial. These activities included transplanting, harvesting, weeding, survey, and the care of livestock. See, for instance Ali, M., et. al.: "The Invisible Farmer: A Profile of Pakistani Rural Women", Pakistan Manpower Review, Vol. XII, No. 1, 1986, pp. 44-65. The latest labor force survey (1988/89) is being redesigned to better reflect women's contribution to the labor force.

TABLE 5.3: LABOR FORCE PARTICIPATION RATES BY SEX
1951 - 1986/87
(Percent)

| Year/Data Source | Crude Participation Rates a/ | | Refined Participation Rates | |
|----------------------------|---------------------------------|--------|--------------------------------|--------|
| | Male | Female | Male | Female |
| <u>Population Census</u> | | | | |
| 1951 | 55.1 | 2.1 | 79.4 | 8.1 |
| 1961 | 55.1 | 6.1 | 80.8 | 9.3 |
| 1972 | 55.4 | 6.2 | 77.6 | 9.0 |
| 1981 | 50.5 | 2.1 | 76.1 | 3.3 |
| 1984 | 51.4 | 2.2 | 76.1 | 3.3 |
| <u>Labor Force Surveys</u> | | | | |
| 1966/67 | 57.6 | 7.7 | 86.7 | 10.3 |
| 1967/68 | 57.8 | 6.4 | 86.7 | 10.5 |
| 1968/69 | 52.4 | 4.4 | 79.0 | 6.6 |
| 1969/70 | 53.3 | 4.9 | 79.8 | 7.3 |
| 1970/71 | 53.1 | 5.4 | 80.0 | 8.1 |
| 1971/72 | 51.9 | 5.4 | 78.6 | 8.0 |
| 1974/75 | 52.1 | 4.3 | 76.6 | 6.0 |
| 1978/79 | 52.3 | 7.9 | 77.3 | 11.8 |
| 1982/83 | 51.5 | 7.2 | 75.2 | 10.7 |
| 1984/85 | 51.7 | 5.8 | 77.1 | 8.7 |
| 1986/87 | 49.5 | 7.9 | 73.5 | 11.9 |

Notes:

a/ Crude participation rates are expressed as the ratio of the labor force to total population, refined participation rates as the rates of the labor force to the economically active population.

than 60% of rural males outside the labor force were in school, among the young and aged, or were disabled. Similarly, about a quarter of urban males outside the labor force had no defined activity. Adjusting for underestimation would add some 12 million rural women and about 2.4 million males to Pakistan's labor force,^{7/} and provides a more accurate picture of supply pressures on the labor market. Thus, while these adjustments would suggest that Pakistan's labor force grew at the same rate (2.8% during 1972-85) as that suggested by official statistics, the increase in numbers is considerably higher (12.3 million compared to 8.5 million).^{8/}

5.05 Child Labor. While underestimating female labor force participation, official statistics reveal a substantial, if declining, proportion of male children in Pakistan's labor force. Nearly 40% of male children between ages 10 and 14 were in the labor force in the 1960s and early 1970s, and 35-40% since the late 1970s. These figures are much higher than in many other developing countries, such as Egypt, Sri Lanka, and Taiwan. Further, no information exists on the number of hours worked by children, their productivity, or wages. Data on determinants of labor force participation among children are also scarce. However, data from a recent urban survey indicated that such participation varies with age of the children and (inversely) with fathers' education, no other variable being significant.^{9/} The inverse correlation with father's education, a proxy for income and socio-economic status, suggests that children's work is used to supplement family income.

5.06 Regardless of whether children participate in the labor force, their presence is an important element in the relationship between household fertility and labor supply (paras. 3.18-3.25). The above urban survey shows no relationship between the presence of children and female labor force participation in rural areas; however, the presence of girls aged 7-14 increased, and of boys of similar ages decreased, female labor force participation in urban areas. Urban male labor force participation increased as the number of children in the household increased, suggesting that urban males at least feel the economic pressure of high fertility. This, combined with the high incidence of child labor, confirms the positive relationship between family fertility and labor supply. However, whether such a relationship exists at the macro-level is difficult to determine.

Employment and Unemployment

5.07 Employment Structure and Trends. Several developments characterize Pakistan's labor market on the demand side. First, the demand for labor has

7/ This assumes that all the above males are part of the labor force. This is likely to overestimate labor force participation; however, no data exist to determine the proportion of males to be included.

8/ Adjustments for 1972 and 1984/85 were based on women participation rates in the 1980 Agricultural Census and on the estimated shares of "omitted" male workers in the 1981 Population Census. No change in these rates and shares was assumed.

9/ The urban survey was conducted by the International Food Policy Research Institute (IFPRI) and covered approximately 1500 males and a similar number of females.

kept pace with the growth of the labor force (net of international emigration). Second, employment growth has been accompanied by changes in employment structure, with sectors like small scale manufacturing and construction absorbing relatively more labor, and hence increasing their shares of total employment. Third, real wages have grown in agricultural and non-agricultural sectors over the last two decades, reflecting healthy labor demand growth, both at home and in the Middle East.

5.08 Official data reveal an estimated total employment growth of over 3% a year during 1971/72-1978/79, with the employed workforce rising from an estimated 19.1 million to 24.5 million during this period (Table 5.2). These represented some 97-98% of the labor force. Employment growth is estimated to have continued at close to 3% p.a. since 1978/79, the considerably lower employment growth estimate from official data sources resulting from undercounting employment among women, and underestimation of labor absorption growth, especially in small scale manufacturing (para. 5.4).

5.09 In the 1970s, employment growth was highest in the utilities, construction, manufacturing, and commercial sectors (Table 5.4). Since the late 1970s, employment growth has been led by the small scale manufacturing subsector (SSS), and by the construction and service sectors (commerce, transportation, financing, "others"). With an estimated 3 million workers, the SSS accounts for 85% of the total employment in manufacturing, but produces less than 30% of the sector's output. It consists of both small businesses and household units employing an average 2.3 workers and possessing fixed assets of under Rs 30,000 per unit in 1983/84. Employment grew in this subsector because of its impressive output growth - 13% p.a. in real terms between 1976/77 and 1983/84. While official estimates indicate that SSS employment grew under 2% during 1978/85, 10/ recent data from the Survey of Small-scale and Household Manufacturing Industries (1983/84) put it considerably higher (nearly 6% p.a.). 11/ That many rural women, most of whom have been omitted from official labor force statistics, are involved in production at household enterprises and in non-agricultural activities, and the existence of strong intra- and inter-sectoral linkages between the SSS and other sectors also suggests substantial employment growth as output increases.12/

5.10 In addition to small scale manufacturing, employment in the construction and service sectors rose more rapidly than the national average. The increase in construction employment reflected large scale public works, large inflows of migrant remittances, and economic growth of the economy. Slower employment growth since the late 1970s (4-5% p.a. since 1978/79 compared to 9% p.a. for 1971/79) may have been caused by labor supply constraints because of the outflow of migrants to the Middle East. Service sector employment reflected value added growth of over 7% p.a. since 1971/72. (Table 5.4).

10/ Based on an elasticity of 0.18 (Table 5.5) and value added growth at 9.7% p.a. for 1978/79 - 1984/85.

11/ This survey, compared with one undertaken in 1976/77 indicated that employment in the SSS rose 80% while value added expanded 135%.

12/ For estimates of linkages, see "Employment Issues in Pakistan," The World Bank, Report No. 7523-PAK, December 1988.

TABLE 5.4: EMPLOYMENT AND LABOR PRODUCTIVITY GROWTH
1971/72 - 1986/87 ^{a/}

| | Employment Growth (% p.a) | | Contribution to Employment Growth (%) | | Employment Elasticity c/ | | Labor Productivity Growth (% p.a) d/ | |
|-----------------------------|---|---------------------|--|---------------------|---|---|---|---------------------|
| | 1971/72 - 1978/79- 1978/79 - 1986/87 | 1978/79- 1986/87 | 1971/72 - 1978/79- 1978/79 - 1986/87 | 1978/79- 1986/87 | 1971/72 - 1978/79- 1978/79 - 1986/87 | 1971/72 - 1978/79- 1978/79 - 1986/87 | 1971/72 - 1978/79- 1978/79 - 1986/87 | 1978/79- 1986/87 |
| Agriculture | 2.2 | 1.6 | 35.3 | 33.2 | 0.92 | 0.41 | 0.2 | 2.3 |
| Manufacturing ^{b/} | 5.2 | 2.1 | 20.9 | 12.5 | 0.99 | 0.21 | 1.1 | 7.6 |
| Large Scale | 0.7 | 0.0 | 0.4 | 0.0 | 0.21 | 0.00 | 2.6 | 10.4 |
| Small Scale | 6.1 | 2.4 | 20.5 | 12.5 | 0.80 | 0.28 | 1.0 | 5.9 |
| Electricity, etc. | 12.5 | 2.9 | 1.8 | 0.8 | 1.51 | 0.30 | -3.7 | 6.6 |
| Construction | 9.0 | 5.2 | 10.5 | 11.1 | 0.84 | 0.61 | 1.6 | 3.0 |
| Commerce | 5.1 | 3.5 | 15.6 | 16.2 | 0.98 | 0.45 | 0.1 | 4.1 |
| Transportation | 3.2 | 3.8 | 4.5 | 7.4 | 0.45 | 0.48 | 3.7 | 3.9 |
| Financing | 3.1 | 1.1 | 0.8 | 0.4 | 0.28 | 0.14 | 7.8 | 6.7 |
| Other services | 3.4 | 4.2 | 10.6 | 18.5 | 0.43 | 0.61 | 4.3 | 2.5 |
| All Sectors | 3.4 ^{e/} | 2.5 | 100.0 | 100.0 | 0.66 | 0.36 | 1.7 | 4.3 |

Notes:

^{a/} Sectoral employment estimates are obtained by applying proportions reported in LFSs to population data.

^{b/} Includes mining.

^{c/} Rate of Growth of employment/rate of growth of value added.

^{d/} Value added per employed worker.

^{e/} Growth rate differs from estimate using the 1972 Population Census in Table 5.2.

Source: Labor Force Surveys.

5.11 In common with other developing countries, employment growth in agriculture lagged behind that in other sectors, and the employment share of agriculture declined throughout the 1970s (Table 5.5). In addition, official statistics report deceleration in the growth of agricultural employment since the mid-1970s. One explanation for this deceleration occurring so soon after a vigorous demand for agricultural workers (due to expanding cultivated acreages and enhanced water availability) is the "Green Revolution" in fertilizer, seeds, etc. - that raised yields without proportionate increases in labor inputs. This led to the resumption of land for self-cultivation, made possible by increasing tractorization, which displaced agricultural labor.^{13/} The decline in agricultural employment growth is also consistent with growing competing demand for workers in non-agricultural activities resulting from rapid economic growth. Further, since women may only work in their husband's fields, growth in the female agricultural labor force could not take up the slack. Outmigration of predominantly male workers from the rural areas to urban areas and overseas put further pressure on the labor supply in agriculture. Rising off-farm employment ^{14/} and increases in real agriculture wages (Table 5.6) are consistent with the above developments.

5.12 Although output grew 8% annually since 1971/72, employment growth in the large scale manufacturing subsector (LSS) ^{15/} lagged. This reflected a shift away from labor intensive consumer goods industries towards more capital intensive intermediate goods industries (whose output share doubled from 9% to 17% during 1971-81). It also reflected capital intensification within each industry in response to inflation of wage costs with increasing outmigration of skilled workers to the Middle East, and to policies -- subsidized interest rates, preferential tariffs, and labor legislation protecting labor ^{16/} --

13/ See ILO/ARTEP: Midterm Review of the Employment and Labor Market Situation during the Sixth Five Year Plan (1983-88), Bangkok, Oct. 1985; and Khan, M.H.: Lectures on Agrarian Transformation in Pakistan, Pakistan Institute of Development Economics, Islamabad, 1985.

14/ According to the 1973 Housing, Economic and Demographic Survey and the 1981 Population Census, the rural non-agricultural workforce rose from 3.7 million, or 28% of the total rural workforce, to 5.1 million, or 31% of the rural population between 1973 and 1981.

15/ Large scale manufacturing enterprises are defined either as those with over Rs 5 million (about US\$300,000 at current exchange rates) in fixed assets, or 10 employed workers, but have considerably larger investments (Rs 8 million, or about US\$760,000, in 1981/82 according to the Census of Manufacturing Industries) and employment (122 workers) on average.

16/ Pakistan's social security schemes and labor legislation were modeled after, and are comparable to, those established in the industrialized European countries. Labor legislation provides for a 48-hour work week, advanced health and safety standards, special working regulations for women, and overtime and leave benefits, while wages are guided by minimum wage legislation, and indexed to the rate of inflation. For details, see ILO: Report on the Sectoral Review Mission to Pakistan, 1986, Bangkok, Chapter V.

**TABLE 5.5: SECTORAL DISTRIBUTION OF THE EMPLOYED WORKFORCE
1971/72 - 1986/87
(Percent)**

| Sector | 1971/72 | 1974/75 | 1978/79 | 1982/83 | 1984/85 | 1986/87 |
|---|----------------|----------------|----------------|----------------|----------------|----------------|
| Agriculture | 57.3 | 54.8 | 52.7 | 52.7 | 50.6 | 49.2 |
| Mining & Quarrying | 0.4 | 0.2 | 0.1 | 0.1 | 0.2 | 0.2 |
| Manufacturing | 12.5 | 13.6 | 14.5 | 13.4 | 13.7 | 14.0 |
| Electricity, Gas & Water | 0.4 | 0.5 | 0.7 | 1.1 | 0.7 | 0.7 |
| Construction | 3.4 | 4.2 | 4.7 | 4.8 | 5.6 | 6.0 |
| Wholesale, Retail, Commerce | 9.9 | 11.1 | 11.1 | 11.9 | 11.5 | 12.0 |
| Transport, Storage | 4.8 | 4.9 | 4.7 | 4.6 | 5.2 | 5.2 |
| Financing, Insurance | 0.2 | 0.7 | 0.9 | 0.8 | 0.9 | 0.8 |
| Community, Social, Personal Services ^{a/} | 10.8 | 10.0 | 10.4 | 10.6 | 11.6 | 11.9 |

Note:

^{a/} Includes all other activities.

Source: Labor Force Surveys.

TABLE 5.6: REAL WAGE TRENDS IN SELECTED SECTORS
1970-87 ^{a/}
(Index)

| Year | Large Scale Manufacturing Industries | | Small Scale Household Manufacturing d/ | Construction ^{b/} | | | Agriculture Male Casual Workers |
|--------------------|---|------------------------------|---|----------------------------|-----------------|--------|---------------------------------------|
| | Punjab ^{b/} | All Workers ^{c/} | | Unskilled Labor | Car- penters | Masons | |
| 1970 | - | 100 | - | 100 | 100 | 100 | 100 |
| 1972 | 100 | 107 | - | 94 | 102 | 102 | 105 |
| 1973 | 99 | - | - | 91 | 95 | 97 | 151 |
| 1974 | 95 | - | - | 106 | 95 | 94 | 160 |
| 1976 | 99 | 122 | - | 129 | 110 | 105 | 121 |
| 1977 | 98 | - | 100 | 143 | 124 | 123 | 129 |
| 1978 | 100 | 149 | - | 160 | 142 | 140 | 134 |
| 1979 | 102 | 157 | - | 160 | 143 | 129 | 138 |
| 1980 | 114 | - | - | 154 | 152 | 145 | 145 |
| 1981 | 115 | 165 | - | 149 | 142 | 141 | 191 |
| 1982 | 117 | 169 | - | 146 | 143 | 138 | 186 |
| 1983 | 125 | 180 | - | 143 | 136 | 135 | 215 |
| 1984 | 134 | 191 ^{b/} | 123 | 129 | 126 | 126 | - |
| 1987 ^{e/} | - | - | - | 149 | 132 | 132 | 224 |

Notes:

- ^{a/} Money wages deflated by the consumer price index.
- ^{b/} From ILO/ARTEP (1985) Mid Term Review of Employment and Labor Market Situation During the Sixth Five-Year Plan (1983-88). Op. Cit.
- ^{c/} Employment cost per worker (wage plus cash and non-cash benefits), from Censuses and Surveys of Manufacturing Industries.
- ^{d/} Employment cost per worker, from Surveys of Small-Scale and Household-Manufacturing Industries.
- ^{e/} All data for 1987 are from the Pakistan Economic Survey, 1986-87.

that favored capital over labor. In addition, labor legislation appears to have led to fragmentation of industrial units, since labor legislation was less easily enforced on small establishments, and, it is believed, to widespread subcontracting. The LSS workforce has not exceeded 0.5 million since the early 1970s, less than 20% of total manufacturing employment.

5.13 Healthy economic growth explains employment growth in most sectors. Real wages have also been increasing (Table 5.6) particularly in agriculture. Workers migration to urban areas and overseas, and rising demand for off-farm labor even in rural areas have brought about real wage increases of 125% for casual agricultural labor since 1970. Similarly, the rise in real manufacturing wages in the 1970s reflected the healthy demand for skilled labor, and was made more acute by their increasing emigration to the Middle East from the late 1970s. Real wage growth was also made possible by productivity gains; in the LSS, real wages rose as value added per worker increased (1969/70 - 1970/71, after 1975/76) but fell as value added per worker fell (1970/71 - 1975/76). Wages of the LSS and SSS tended to move together. Wages are higher for workers in the LSS, reflecting liberal wage policies during the early 1970s and barriers to entry. The limited number of jobs in the LSS restricts the benefits of wages and labor protection to only a small fraction of the manufacturing workforce. Without a general labor legislation umbrella, wages in the SSS are determined by demand and supply. Construction wages, which rose sharply during the 1970s, started to decline around 1980 because of the decline in net emigration to the Middle East.

5.14 Unemployment, Underemployment and Labor Surpluses. Despite rapid labor force growth labor surpluses have not appeared critical because of strong economic performance (6.5% annual GDP growth since 1977/78), outmigration of workers to the Middle East, and labor segmentation by gender in agriculture. Open unemployment was reported to be less than 2% of the labor force until 1974/75, rising to a modest 3.5% in 1978/79, and remaining close to 4% thereafter (Table 5.7).^{17/} However, rapid population growth over the last decade has rapidly increased the number of young people looking for work and youth unemployment rates are several times the national average. For instance, the unemployment rate for those aged 10-24 was 6.9% in 1985/86, compared to the national average of 3.6%. Youth unemployment will persist over the next decade as the growth of the young labor force outpaces the growth of the total labor force. Unemployment among the educated (currently

17/ The generous definition of unemployment used in official statistics undoubtedly resulted in unemployment being underestimated. Open unemployment is defined in Labor Force Surveys to include all persons in the civilian population who, during a given period (one reference week), were not working but looking for work, or not looking for work because of illness. In accordance with ILO recommendations an explicit time cut-off of 15 hours has been applied only to unpaid family workers to identify those who are work. Among others in the labor force, working for pay only a few hours a week would qualify a person as being employed. Applying a 15 hour a week cut-off to the entire labor force would have raised the unemployment rate to 5.2% in 1982/83 and to 4.6% in 1984/85.

TABLE 5.7: UNEMPLOYMENT AND UNDEREMPLOYMENT
1968/69 - 1986/87

| Year | Unemployment Rate (% of Labor Force) | | | Working less than 35 hours/week (% of Employed Workforce) | | |
|---------|---|-------|-------|--|-------|-------|
| | Total | Rural | Urban | Total | Rural | Urban |
| 1968/69 | 2.1 | 1.7 | 3.5 | 14.0 | | |
| 1969/70 | 2.0 | 1.8 | 2.9 | 8.3 | | |
| 1970/71 | 1.8 | 1.4 | 3.0 | 7.2 | | |
| 1971/72 | 2.0 | 1.7 | 3.7 | 4.4 | | |
| 1974/75 | 1.7 | 1.3 | 2.7 | 4.8 | 5.5 | 2.8 |
| 1978/79 | 3.5 | 3.0 | 5.2 | 13.0 | 18.6 | 4.7 |
| 1982/83 | 3.9 | 3.3 | 5.8 | 14.0 | 16.2 | 7.0 |
| 1984/85 | 3.7 | 2.9 | 5.7 | 9.6 | 11.6 | 4.0 |
| 1985/86 | 3.6 | 3.1 | 5.0 | 9.8 | 12.0 | 3.5 |
| 1986/87 | 3.1 | 2.5 | 4.5 | 10.4 | 12.7 | 4.4 |

Source: Labor Force Surveys.

of considerable concern to government) is a subset of the youth unemployment problem. Official statistics show that educated unemployment is a recent and primarily urban phenomenon. The LFS, 1985/86, revealed unemployment rates among "matriculates" (those who have completed secondary education) double those of the national average. In urban areas, matriculates were three times as likely to be unemployed.

5.15 Though probably higher than government figures show, underemployment was moderate by developing country standards. Officially reported underemployment (which took no account of women working in agriculture or the "hidden" male workforce, defined to include those who work less than 35 hours a week) was 5-14% of the employed labor force.^{18/} In contrast to open unemployment, underemployment is primarily a rural phenomenon; its incidence was two to three times higher in rural areas than in urban areas. The predominance of part-time work among rural women who are not allowed to work outside their homes, contributes to higher rural underemployment. In urban areas, underemployment is higher in parts of the informal sector.^{19/}

Implications and Future Prospects

5.16 The above developments have major implications for future labor markets in Pakistan. As in the past, population parameters figure prominently in labor market dynamics, especially on the supply side. Thus, increments in labor force size depend primarily on demographic changes. Beyond 2000, changes in the rate of population growth will affect the size of the working age population, and the labor force. In the short-run, the working age population is determined by historic population growth, so participation rates will decide labor force size. Among males, age-specific participation rates (ASPRs) have been uniformly high, especially after adjustments to include the "hidden" labor force (para. 5.4). While male labor force participation should remain high, female work participation in agriculture probably will not change (para. 5.6) because women must combine agriculture with household work. In urban areas, a small increase in female work participation rates is likely assuming continued economic growth and that better educational facilities for girls will increase their chances for employment.

5.17 Demographic change affects Pakistan's labor supply in two other respects. First, as in the past, continued rapid growth of population would make labor force younger even with no change in participation rates. In addition, high fertility may be associated with high labor force participation

18/ The use of hours of work to define underemployment ignores those underemployed by virtue of low productivity work that yields low incomes despite long hours of work. Poverty studies in Pakistan show some one-third of the population subsisting below the poverty line, defined either in terms of an income threshold or of caloric intake.

19/ See Kazi, S.: "Skill Formation, Employment and Earnings in the Urban Informal Sector", Paper presented at the Fourth Annual General Meeting of the Pakistan Society of Development Economists, Islamabad, August 1987.

among male children at the household level, although growing school opportunities may counteract this, thus reinforcing the trend towards a younger labor force. Second, while independent of demographic factors within Pakistan, increased competition in the migrant labor market and slack economic conditions in the Middle East has diminished prospects for outmigration. With lower outflow and increasing numbers of returning migrants (estimated over 100,000 by 1980), net in-migration (an estimated 50,000 workers annually) is already the rule.^{20/} This volume of return migration will gradually diminish after 1990, and a constant number of Pakistani migrants will remain in the Middle East. However, reduced expatriate remittances will induce some current non-workers to enter the labor market.

5.18 Labor Force Growth and Labor Surpluses. Projected labor force growth will affect Pakistan's future economic prospects through the impact on growth of potential labor surpluses and through the effect of labor surpluses on labor force quality. The growth impact is illustrated by labor force projections based on the population growth scenarios in Chapter 2 (Table 5.8). These projections show that regardless of future population growth, the size of the working age population will increase from 64.9 million in 1985 to 87.5 million in 1995 (3% a year). As a result, Pakistan's labor force will increase from 42.9 million to 53.4 million (3.1% a year). Hence, employment will have to be found (within Pakistan or overseas) for some 15.5 million new workers during these 10 years if the absolute number of openly unemployed is held constant or for some 13 million if unemployment stays at current levels (4-5%). Continued rapid population growth (indicated by the "high" population projection) leads to a working age population of 203 million and a labor force of 154 million by 2025. Lower population growth, illustrated by the "low" projection, will make a difference after 1995, and lead to a working age population of 181 million and a labor force of 129 million by 2025.^{21/}

5.19 Projections of labor surpluses/unemployment also depend on prospects for labor demand which, in turn, depend on expectations about how the economy and the population will grow. The macro-economic framework for projecting labor demand assumes an environment of sustained growth supported by adjustment policies that seek to minimize distortions and promote efficient use of Pakistan's human resources. ^{22/} Annual agricultural output growth of 3-4% in this framework assumes that (i) better input management finds considerable scope for increasing production, (ii) on the expectation that labor shortages will diminish with continued growth of the rural labor force, and (iii) on the likelihood that technology will shift to accommodate any

20/ See ILO/ARTEP : Impact of Out- and Return-Migration on Domestic Employment in Pakistan.

21/ Projected changes in the age structure under the "high" population growth scenario are expected to initially reduce the crude labor force participation rate marginally from 44.6% in 1990, but increase it thereafter. This rate increases monotonically from 1985 under the "low" scenario.

22/ This is the "growth with adjustment" scenario described in World Bank: Pakistan: Growth Through Adjustment, Report No. 7118-PAK, March 1988.

TABLE 5.8: LABOR FORCE AND EMPLOYMENT PROJECTIONS
1985-2025

| | 1985 | 1990 | 1995 | 2000 | 2010 | 2025 |
|-----------------------------------|------|------|------|------|------|-------|
| Labor Force (High), mil <u>a/</u> | 42.9 | 49.6 | 58.4 | 69.1 | 96.5 | 154.1 |
| % aged 10-24 | 37.9 | 39.3 | 40.9 | 41.3 | 40.4 | 36.6 |
| % females | 34.6 | 35.4 | 36.2 | 36.9 | 37.8 | 38.8 |
| Labor Force (Low), mil | 42.9 | 49.6 | 58.4 | 68.3 | 90.4 | 128.6 |
| % aged 10-24 | 37.9 | 39.3 | 40.9 | 40.6 | 36.4 | 31.0 |
| % female | 34.6 | 35.4 | 36.2 | 36.9 | 37.7 | 38.6 |
| Employment, mil <u>b/</u> | 42.2 | 47.9 | 54.5 | 62.6 | 82.6 | 124.8 |
| % agriculture | 61.6 | 59.4 | 57.1 | 54.9 | 50.7 | 45.2 |
| Unemployment Rate <u>b/</u> | | | | | | |
| % (High) | 4.7 | 6.6 | 9.9 | 12.9 | 17.9 | 22.7 |
| % (Low) | 4.7 | 6.6 | 9.9 | 11.8 | 12.4 | 7.4 |
| Growth Rates (% p.a.) | | | | | | |
| Labor Force (High) | | 2.9 | 3.3 | 3.4 | 3.4 | 3.2 |
| (Low) | | 2.9 | 3.3 | 3.2 | 2.8 | 2.4 |
| Employment | | 2.6 | 2.6 | 2.8 | 2.8 | 2.8 |

Notes:

a/ Labor force is projected using age-specific participation rates, from the 1981 Population Census adjusted for omitted workers (rural women and urban males). International migration assumptions are those described in para. 4.17. "High" refers to the high population growth projections, and "low" to the low population growth projection.

b/ Omitted workers (footnote b/) are included among the employed work force, while 50% of the "hidden" male workers are considered employed and the remainder unemployed.

changes in factor endowments.^{23/} This implies undiminished labor absorptive capacity in agriculture compared to the last decade. In industry, projected real output growth of about 9% p.a., combined with expected productivity growth of 4-5% p.a., equivalent to historical growth rates since 1970, would imply employment increasing 4-5% p.a. a year. Labor absorption in relation to value added in the service sector is also projected to remain unchanged from the recent past. These assumptions, together with the adjustment for the "hidden" and "omitted" workforce, result in an employed workforce of 42.2 million in 1985 that rises to over 50 million in 1995,^{24/} the size of the latter depending on how many of the "hidden" workforce are "employed".

5.20 The more rapid growth of labor force compared to employment implies a doubling of unemployment from about 5% in 1985 to 10% in 1995. Continued high population growth will lead to sharp increases in the rate of unemployment after 1995; this rate is projected to double again to over 20% by 2020. Until 1995 the increased unemployment rates cannot be averted, but with lower population growth these rates will peak thereafter and then decline. Thus, high population growth implies higher unemployment rates than Pakistan has experienced historically. This will occur despite rapid increases in economic growth and employment growth. But future unemployment will be affected in several other ways. The above employment projections assume that economic growth will be independent of population growth. Hence, should population growth affect economic growth adversely, the level and the rate of unemployment increases will be higher than projected in Table 5.8. In addition, the demand for labor is also not independent of its supply, since a growing labor surplus will lower wages, raise labor absorption, and cut unemployment. Finally, the projected labor productivity growth of over 3% p.a., while no higher than that achieved since 1970, may not be sustained over the long term. Lower labor productivity growth will imply higher employment growth than projected.

5.21 Whether international migration can reduce future labor surpluses in Pakistan is an important issue, given its significance for the country in the past. Historically high population growth, while producing some 15 million new workers in the coming decade, will require annual net emigration of 300,000 workers to keep unemployment rates at current levels. Continuation of said population growth will require a tripling of this figure during 1995-2025. However, the low population projection will imply average annual net emigration of just over 100,000 by 2025. Nonetheless, flows of these magnitudes will be difficult to achieve. At the height of out-migration to the Middle East and after a decade of outflows, the total number of emigrants

23/ Projection methodologies are detailed in "Employment Issues in Pakistan," The World Bank, Report No. 7523-PAK, December 1988.

24/ With agricultural employment growing at just under 2% compared to overall employment growth of 2.6%, its share will decline from 62% of total employment to 57% between 1985 and 1995. Employment in manufacturing is projected to account for an increasing share of non-agricultural employment - from 29% in 1985 to 33% in 1995.

in those countries is only about 2.5 million.^{25/} This represents no more than about 15% of the 15 million new jobs required to keep unemployment rates to current levels over the coming decade. Recent evidence points to little net out-migration in the years ahead. Although policies to promote emigration may preempt further increases in inflow, a return to large outflows of workers is unlikely. At the same time, the decline in remittances with reduced out-migration will probably induce those non-workers who depend on remittances to look for work. Thus, future developments in international migration of Pakistan's workers are likely to be unfavorable because (i) emigration will no longer be a large outlet for surplus labor; (ii) the decline in emigration will actually increase labor force participation, and hence the number of persons looking for work within Pakistan; and (iii) lower remittance inflows imply lower demand for goods and services, and correspondingly diminished labor absorption.

5.22 Labor Force Quality. The second way that labor force changes affect economic growth is by changing labor force quality. Once again, demographic shifts play a key role in determining the extent of this impact. The age composition of the labor force will change as past population increases raise the proportion of the labor force between ages 10 and 24 to nearly 41% by 1995 (Table 5.8). The "high" population projection will keep this proportion high until 2025, and even the "low" projection would not envisage a big decline in this proportion until after year 2000. A more youthful labor force more than proportionately increases youth unemployment. In addition, a more youthful labor force implies a less experienced, labor force with a greater need for job training. Rising school enrollments will gradually increase the educational attainment of the labor force and improve its quality. But illiterate working adults will no longer benefit from formal schooling. Hence, even assuming that primary and secondary school enrollment grow at Seventh Plan target rates (Chapter 4), the proportion of literates in the labor force is projected to rise from 31% in 1985 (LFS) to no more than 44% in 1995. Further, with limited financial resources for education rapid population growth retards improvements in the educational attainment of the labor force. Again, lower population growth will result in a higher proportion of educated workers after 1995 - 83% in 2025, compared with 68% under "high" population growth.^{26/}

5.23 The gender distribution of the workforce is an aspect of labor force quality that affects productivity and therefore incomes. With rapid population growth, excess labor supply pressures will intensify pressures to keep women from working. On the other hand, increased consumption needs of large families, may necessitate women from poor households to work.

25/ For the period 1978/79 - 1981/82, estimates of the stock of migrants varied between 1.4 million and 2.5 million. A PIDE study gave a figure of 1.8 million for 1979, while the Population Census (10% Count) estimated the migrant stock to be 1.7 million in 1981.

26/ Improvements in the educational attainment of the young working age population generally have a dominant impact on improvements for the entire working age population.

5.24 Wages. Gains in size and quality of the labor force will affect real wages and labor income. In the short term, returning overseas migrants and migrants from rural areas could help ease labor shortages in the urban sector, and possibly reverse wage growth, particularly in the small-scale/informal sectors. Prospects for agricultural wages will depend on future output growth in the sector, the extent to which gender-specific labor segmentation (itself a function of wages) will decline, and the agricultural/non-agricultural, and rural/urban, wage differential. Continued output growth and the expectation that labor segmentation will diminish only gradually make for increases in agricultural wages in the short term, and gradually compress rural/urban wage differential thereafter. In the long term, rapid population growth will bring wages down, while reduced emigration will limit its role as a safety valve for surplus labor. In this instance, the potential for wage increases would be tied to productivity increases that result from improvements in labor force quality. However, rapid population growth strains the country's capacity to provide basic education and limits prospects for productivity enhancement. Low labor force quality could change Pakistan's international competitiveness despite lower wages. Finally, lower real per capita incomes will compromise households' ability to pay for improved education services, and limit their increase in purchasing power (and the market benefits that flow from it.)

5.25 Policy Implications. Tightness in urban and rural labor markets as exemplified by rising returns to labor, low unemployment, and moderate underemployment, does not suggest widespread labor surpluses or population pressure on the labor market at the present time. Rapid economic growth, accompanied by migration to the Middle East and incoming remittances, has kept labor demand buoyant while constraints on female labor market participation have limited labor supply. These conditions are expected to continue in the short term; the "employment problem", or labor surplus, should not pose a problem so long as appropriate macro- and sectoral policies ensure rapid economic growth. Drastic remedies such as make-work programs are unwarranted, since these would require resources probably beyond GOP's ability.^{27/} However, the impact of past population growth has been to increase substantially Pakistan's labor supply through the next decade, so that unemployment will increase even with healthy economic growth. Further, the labor force is getting younger, and GOP should pay special attention to providing productive employment opportunities to younger workers.

27/ In this context, the Five Point Program was, among its many objectives, a response to the employment problem in the short-run. This program involves direct government intervention in the labor market through extensive construction activities, e. g., rural roads, housing and improvement of urban slums, creation of additional teaching and administrative positions sanctioned in the education system and expansion of health services, especially in rural areas. These activities were expected to generate 700,000 new jobs for the unemployed over the period 1986-90. A total of Rs 117 billion was allocated to the program, including a National Employment Fund of Rs 8 billion (Rs 2 billion a year) to support employment intensive activities.

Macro-policies that simultaneously stimulate growth and labor intensity in production may be most effective in promoting long-term employment, but policies are needed to train youth to overcome their lack of skills or low literacy. Support policies that intervene only indirectly in the labor market (such as credit, infrastructure, and training programs) are also appropriate in sectors that combine productive efficiency with labor absorptive potential, such as small scale manufacturing.

5.26 In the long-run, demographic factors will determine the size and structure of labor surpluses. The growing numbers of young people will swell the labor force and even a fast growing economy will be strained in its ability to create sufficient new jobs. Macro-policies alone will not be able to contain the growing labor surpluses. Only appropriate population policies can do that by arresting the high rate of natural population increase through appropriate child spacing complemented by improved health and education services. GOP should consider macroeconomic policies to promote a labor absorbing economic structure and to upgrade workforce quality. Macroeconomic policies to increase labor demand are sketched in the recently released report on employment 28/ and include trade and industrial incentives and appropriate factor pricing and policy reform.

28/ "Employment Issues in Pakistan," The World Bank, Report Number 7523-PAK (op. cit), December 1988.

CHAPTER 6

POPULATION GROWTH, AGRICULTURE, AND THE NATURAL RESOURCE BASE

Introduction

6.01 Agriculture typically carries large weight in the economic development of developing countries.^{1/} Pakistan is no exception: agriculture still accounts for about one-quarter of GDP (Table 6.1). Over half of Pakistan's merchandise exports are agricultural (raw cotton, rice) or agriculture-based (textiles, leather, etc.); about 10% of imports are agricultural goods (wheat, edible oil, tea). About 70% of the population live in rural areas. Agriculture employs about half of the labor force, more if the "omitted" labor force is included.

6.02 Demographic change has the following specific consequences for agriculture:

(i) Population growth affects the total, as well as structure of, demand for agricultural output, with implications for marketed surpluses and exports;

(ii) Population pressure can elicit responses in the form of increasing the area under cultivation (land extensification), the move to marginal land, change in the size of land holding and land intensification. The latter is achieved by switching from land-using to land-saving types of cultivation (e.g., from grazing cattle to raising permanent crops), by more intensive application of other inputs (such as fertilizer, chemicals, irrigation or labor), and by technological substitution of relatively more labor-intensive methods;

(iii) The economic-demographic response to population growth involves migration from areas that are "economically" overpopulated to regions that have a better balance between population and resources, or to other countries;

(iv) The responses in (ii) and (iii) may have effects on the environment, although direct linkages may not be easy to establish. All these factors are important for Pakistan.

The Demand for Agricultural Products and Population Growth

6.03 Pakistan's demand for agricultural products has increased over time, partly the result of population growth, and partly a response to higher incomes. A proxy for actual consumption, the "availability" ^{2/} of foodgrains (wheat and rice) rose from 9.4 million tons to 14.6 million tons during 1971-86, a 3% average increase p.a. (Table 6.2). Thus, foodgrain and milk

1/ The role that agriculture plays in the process of economic development has been justly celebrated in the literature, Johnston, J. and Mellor, J. (1961), "The Role of Agriculture in Economic Development," American Economic Review, September; Mellor, J. and Johnston, J. (1984) "The World Food Equation: Interrelations Among Development and Food Consumption." Journal of Economic Literature, Vol. 22, June.

2/ Production plus net imports, minus provision for seeds/wastage and build-up of stock.

TABLE 6.1: THE IMPORTANCE OF AGRICULTURE IN PAKISTAN'S ECONOMY
(Share of Agriculture, percent)

| | GDP | Exports /a | Imports /b | Population /c | Employment /d |
|---------|------|------------|------------|---------------|---------------|
| 1970/71 | 32.7 | | | 74.8 (1972) | 57.6 |
| 1974/75 | 32.7 | 59.2 | 9.1 | 73.3 | 54.8 |
| 1979/80 | 29.5 | 58.7 | 10.4 | 71.8 (1981) | 52.7 |
| 1984/85 | 25.3 | 52.3 | 14.7 | 70.3 | 50.6 |
| 1985/86 | 24.5 | 56.4 | 14.3 | 69.9 | 54.0 |
| 1986/87 | 23.7 | 52.8 | 8.5 | 69.5 | 49.2 |

Notes

- /a Agricultural exports refer to cotton, cotton yarn, cotton cloth, rice, fish and fish preparations, tanned leather.
- /b Composed of wheat, edible oil and tea.
- /c Share of rural population. 1984/85 - 1986/87 figures estimated based on urban growth of 4.4% p.a. Data for 1972 and 1981 are from Population Censuses.
- /d From Labor Force Surveys.

TABLE 6.2: AVAILABILITY OF FOOD ITEMS AND SELF-SUFFICIENCY, 1970/71 - 1985/86 /a

| | Foodgrains | | | Edible Oils | | | Meat | | Milk | | |
|---------|----------------|------------|-----------|--------------|------------|-----------|--------------|------------|--------------|------------|------------|
| | Availability/b | | Imports/ | Availability | | Imports/ | Availability | | Availability | | Imports/ |
| | Total | Per Capita | Avail.(%) | Total | Per Capita | Avail.(%) | Total | Per Capita | Total | Per Capita | Avail. (%) |
| 1970/71 | 9,436 | 153 | 2.9 | | | | | | | | |
| 1974/75 | 10,558 | 153 | 11.3 | | | | | | | | |
| 1976/77 | 11,380 | 155 | 4.8 | 556 | 5.5 | 52.2 | 675 | 9.2 | 4,073 | 55.5 | 5.0 |
| 1977/78 | 12,584 | 166 | 6.5 | 562 | 5.2 | 50.9 | 742 | 9.8 | 4,166 | 55.1 | 7.4 |
| 1978/79 | 12,540 | 161 | 16.8 | 606 | 6.2 | 59.6 | 782 | 10.0 | 4,122 | 52.9 | 4.5 |
| 1979/80 | 12,514 | 156 | 5.3 | 640 | 6.4 | 53.9 | 823 | 10.3 | 4,369 | 54.5 | 8.1 |
| 1980/81 | 12,886 | 156 | 0.2 | 752 | 7.4 | 61.8 | 869 | 10.5 | 4,379 | 53.1 | 6.4 |
| 1981/82 | 13,132 | 155 | 1.0 | 944 | 7.8 | 66.1 | 918 | 10.8 | 4,415 | 52.1 | 5.2 |
| 1982/83 | 13,461 | 153 | 0 | 1,095 | 7.9 | 58.4 | 947 | 10.7 | 4,708 | 53.3 | 8.8 |
| 1983/84 | 14,299 | 157 | 0 | 1,214 | 8.2 | 60.0 | 1,002 | 11.0 | 4,778 | 52.6 | 5.2 |
| 1984/85 | 14,728 | 158 | 3.7 | 1,321 | 8.1 | 50.4 | 1,092 | 11.6 | 5,076 | 54.4 | 5.5 |
| 1985/86 | 14,635 | 152 | 10.7 | | | | | | | | |

/a Availability is defined as production plus net imports less provision for seed and wastage, and buildup of stocks.

/b Total availability in '000 metric tons, per capita availability in kg.p.a.

Source: Pakistan Agriculture Statistics of Pakistan; Staff estimates.

availability have increased about as fast as the population. The demand for other food products increases with income growth; per capita availability of edible oil and meat has risen by 5% and 3% annually over the past decade. In turn, changes in food demand affect supply responses, notably cropping patterns.

6.04 Pakistan produces most of the food it consumes. Food imports account for no more than 10% of needs (a big exception is edible oil: over half of edible oil consumption is imported). In the aggregate, consumption levels provide adequate nutrition. Food balance sheets for 1982/83 showed per capita availability of 2,464 calories and 65 grams of protein. The real problem is food distribution among households and within families, with the poor particularly disadvantaged.^{3/}

6.05 Among Pakistan's non-food export crops international and domestic markets, rather than Pakistan's population growth, influence demand. For instance, the economic slowdown after the 1970s oil boom and trade barriers like the Multi-Fibre Arrangement hurt Pakistan's cotton exports. Yet domestic production drives export growth because Pakistan's share of the world cotton trade is small.^{4/} Government policies and incentives (pricing, subsidies, research and extension, procurement/marketing) and the weather have affected cotton output and exports.

Agricultural Output and Population Growth

6.06 The relationship between population growth and agriculture in Pakistan hinges upon the sources of the latter's growth. As in other developing countries, while expanding cultivated area has been an important source of output growth historically, land intensification is increasingly the only feasible option in meeting the needs of a growing population. Improving yields (output per unit land) is a measure of the success in raising the carrying capacity of agricultural land; however, the appropriate perspective of the population-agriculture linkage is in terms of changes in labor productivity that ultimately affect agricultural incomes per capita or per household. The supply of labor and changes in land tenure affect labor productivity, while environmental factors are more directly linked to yield levels.

6.07 Trends in Agricultural Output. Pakistan's agricultural sector has alternated periods of vigorous output growth with years of stagnation or productivity decline (Table 6.3). In the 1950s low output growth was due to the disruptive effects of partition from India, water shortages due to a water dispute with India, and bad weather (drought in 1950/51 and 1951/52, and floods in 1954/55 and 1955/56).^{5/} The Green Revolution spurred recovery in

3/ See Alderman, H., et. al.: "Household Food Security in Pakistan with reference to the Ration Shop System", PIDE/IFPRI, Oct. 1987, mimeo.

4/ Under 10% up to 1985 for raw cotton, under 3% for textile yarn and thread. World Bank: Pakistan: Sixth Plan Progress and Future Prospects, Report No. 6533-PAK, Feb. 1987, Table I.8.

5/ See Naseem, S.H.: Underdevelopment, Poverty and Inequality in Pakistan, Lahore, 1981, Chapter III.

TABLE 6.3: AGRICULTURAL OUTPUT GROWTH, 1950/51 - 1986/87
(% per annum)

| | 1950/51-1960/61 | 1960/61-1969/70 | 1969/70-1974/75 | 1974/75-1979/80 | 1979/80-1986/87 |
|----------------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Value Added: | | | | | |
| Total Agriculture /1 | 1.3 | 5.6 | 0.8 | 3.9 | 4.1 |
| Major Crops | 0.9 | 7.8 | -0.3 | 4.1 | 3.9 |
| Minor Crops | 0.3 | 5.1 | 4.3 | 4.4 | 2.7 |
| Output | | | | | |
| Wheat | -0.4 | 7.5 | 1.0 | 7.2 | 1.6 |
| Rice | 1.8 | 9.9 | -0.7 | 6.8 | 1.3 |
| Cotton | 1.9 | 6.6 | 3.4 | 2.8 | 8.6 |
| Sugar-cane | 7.8 | 9.5 | -4.2 | 5.3 | 1.2 |

Note:

/1 Includes forestry, livestock, fishing.

Sources: Pakistan: Economic Survey 1986-87; Agricultural Prices Commission: Agricultural Crops Long-Term Trends, 1947-48 to 1986-87.

the early 1960s. Growth became more intense in the late 1960s, and agricultural output grew 5.6% p.a. for the decade. In the early 1970s agricultural growth slowed because of unfavorable weather (floods in 1972/73 and 1973/74, drought in 1974/75), and because the Green Revolution's gains leveled off. The resumption of rapid growth in agriculture coincided with the launching of Pakistan's Fifth Plan in 1978/79. Average annual growth in agricultural value added topped 4% during the Plan period, nearly twice the 2.3% p.a. rate of the preceding five years. Except for 1983/84, value added growth was a steady 4.4% p.a. during 1982-87. Government policies, good weather, and better water supply and other inputs aided agriculture's improved performance.

6.08 Sources of Agricultural Growth. Whether land extension or labor intensification is the source of agricultural growth depends on the relative abundance of land and labor (population). The early phase of agricultural growth in Pakistan depended on expanding the extensive margin. During 1950-70, the total cultivated area expanded 26%, while the cropped area 6/ increased 30% (Annex 6, Table 1). Large scale water projects and tubewell irrigation brought more land into production and made the Green Revolution possible in the 1960s. Area expansion accounted for the entire increase in rice and sugarcane output in the 1950s and for 30-50% of all major crops' output during the 1960s when Green Revolution boosted crop yields (Annex 6, Table 2).

6.09 The limits of the extensive margin were reached by the early 1970s, since the best cultivable lands in Pakistan had already been brought into cultivation. Although the irrigated area continues to increase, further additions to cultivated area would have to come from decreasing the area in "cultivable waste" (areas around waterworks, areas on each river banks usually left uncultivated as precaution against flood damage) and the area "not available for cultivation" (arid zones, brush land and hilly terrain). Neither offers much scope for area expansion. Hence, future increases in agricultural output will have to come from the intensive margin - increasing yields and/or labor productivity.

6.10 In light of these developments, analysis of the impact of population growth on agriculture requires consideration of two related issues. First, with continued rapid population growth and little land expansion, would the Pakistan situation validate Malthusian predictions of increasing population pressure on land? Second, do population factors affect output growth through land and labor intensification?

Land, Farm Size and Population Pressure

6.11 With population growing at an annual average of 3.0% since the 1950s and area extension proceeding at 1% annually, the land-man ratio declined from 0.4 ha. per capita to 0.24 ha. per capita between 1951 and 1981 (Table 6.4). Evidence also exists that farm holding sizes have fallen; the proportion owning 2 ha. or smaller increased from 64% to 71% during this period while those for larger size categories (2-10 ha., 10-40 ha., over 40 ha.) decreased. However, neither indicator provides convincing evidence of

6/ Cultivated area refers to the net area sown and the area under fallow.
Cropped area refers to the net area and the area sown more than once.

TABLE 6.4: LAND-MAN RATIOS AND THE DISTRIBUTION OF LAND OWNERSHIP
IN AGRICULTURE, 1950-1976

| | 1950 | 1976 |
|---------------------------------|------|------|
| Land-Man Ratio (ha. per capita) | 0.45 | 0.25 |
| % of Persons Owning: | | |
| 2 ha. | 64.4 | 70.8 |
| 2-10 | 28.7 | 25.1 |
| 10-40 | 5.7 | 3.5 |
| 40 | 1.2 | 0.6 |

Source: Khan, M.H.: Lectures on Agrarian Transformation in Pakistan,
PIDE, Islamabad, 1985, p. 23.

population pressure. The land-man index takes no account of changes in the productivity of land or of labor. Indeed, rising yields for crops have resulted in increasing agricultural output or value added per capita, and in improving self-sufficiency. In addition, changes in the distribution of land ownership are equally consistent with a shortage of labor (see para. 6.18).

6.12 Because of economies of scale, farm size is one of the determinants of agricultural productivity. In Pakistan, the proportion of small holdings (under 5 ha.) has increased since 1970 (Table 6.4 and Annex 6, Table 3). Yet this trend had no noticeable effect on yields; farm management surveys show no real differences in yields among farms of difference sizes (Table 6.5). If anything, medium-sized farms (5-20 ha.) have the lowest yields. 7/ Similarly the decline in tenancy has had an ambiguous effect on yields. The surveys did not reveal any systematic differences in yields amount various land tenure arrangements.

6.13 The trend toward smaller farms in Pakistan is not the result of population pressure. Rather, it comes from land tenure changes, increased mechanization, and gender-specific labor market segmentation. While tenants may have been displaced, the reduction in farm size may be a response to a tightened labor supply.

6.14 The decrease in tenancy gave landlords the option of using tenants as an assured source of labor to cultivate their cash crops (sugarcane in Punjab). A sample of landlord and tenant households in Sind revealed that 68% of tenants worked on-farm at the prevailing wage rate. 8/ The decrease in farm size fits in with this trend, since tenancy has been increasing for smallholders on farms of less than 5 ha., especially in Punjab and Sind. An average household (around 3 adults available for full-time work) can comfortably cultivate this amount of land and also spare male labor to work for the landlord's wages. Tenancy thus facilitates female labor for work on the family farm by adjusting the size of the operational unit to the labor endowments of the household. 9/ Hence, changes in land tenure have accommodated the gender-segmented agricultural labor market to the realities of peak-season labor shortages by shifting farm employment from the wage market to the family farm.

7/ Mahmood and Nadeem-ul-Haque (1981). "Farm Size and Productivity Revisited", Pakistan Development Review, Vol. XX, No. 2, Summer; found a U-Shaped relationship between yields and farm size. See also Salam, A. (1978): "Factor Input Use and Farm Productivity in Different Farm Categories in the Punjab", Pakistan Development Review, Vol. XVII, No. 3, Autumn.

8/ Mazid, N. and K. M. Nadvi: "Agrarian Transition in Sind: An analysis of Interlinked Rural Factor Market", Paper presented at the Fourth Annual Meeting of the Pakistan Society of Development Economists, Islamabad, August 1987.

9/ Mazid and Nadvi, (1987) op.cit., found that 85% of their sample of tenant households reported female household members taking part in farm work.

TABLE 6.5: FARM SIZE, LAND TENURE AND YIELDS OF MAJOR CROPS, 1982/83
(kg. per acre)

| | Farm Size a/ | | | Land Tenure | | |
|--------------|--------------|--------|-------|-------------|--------------|--------|
| | Small | Medium | Large | Owner | Owner/Tenant | Tenant |
| <u>Punab</u> | | | | | | |
| Rice-Irri. | 1,122 | 1,136 | 1,516 | 1,356 | 1,286 | 1,043 |
| Rice-Basmali | 899 | 838 | 854 | 838 | 867 | 938 |
| Cotton | 469 | 480 | 516 | 494 | 482 | 474 |
| Wheat | 918 | 926 | 1,046 | 1,014 | 949 | 956 |
| <u>Sind</u> | | | | | | |
| Rice-Irri | 1,469 | 1,446 | 1,590 | 1,531 | 1,074 | 1,524 |
| Cotton | 505 | 516 | 631 | 582 | 564 | 590 |
| Wheat | 931 | 860 | 1,093 | 970 | 836 | 943 |

Note

a/ Small, medium and large farms are defined as those below 12.5 acres, between 12.5 and 50 acres, and over 50 acres respectively.

Source: Pakistan: Agricultural Prices Commission.

6.15 Islamic laws of inheritance have helped reduce the size of farm holdings but have had more impact on the structure of landownership than on the pattern of operational holdings in agriculture.^{10/} Farms are often retained as one operational unit on economic efficiency grounds despite multiple ownership. Between them, the 10.8 million landowners in Punjab, Sind and NWFP in 1981, owned only 4.1 million operational units; 73% of operated holdings were under 5 h.a. in size, but 82% of owned holdings fell into this category.

6.16 Although yields measure the carrying capacity of agricultural land, a more direct measure is labor productivity, since rapid population growth can diminish returns to labor. Data on diminishing returns are scarce in Pakistan. Aggregate data suggest it has not occurred; since 1970 agricultural output grew faster (over 3% p.a.) than the agricultural labor force.^{11/} At the micro-level, the little evidence available on labor productivity is mixed. The marginal productivity of labor increases with farm size. But owner-operated farms have higher productivities than tenant farms, so the impact of smaller farms and owner operation on labor productivity is unclear. Hence, existing evidence offer no confirmation of a Malthusian impact in agriculture.

Constraints to Agricultural Output Growth

6.17 Given the difficulties of increasing the cultivated area, the extent to which raising yields and labor productivity can contribute to future output growth will determine the severity of population pressure on agriculture. The potential for productivity increases is limited by several major constraints - inadequate input management and institutional support, labor supply bottlenecks, and environmental degradation. While the impact of population on agriculture is manifested through the latter two constraints, better resource management and investment are no less critical to future productivity growth.

6.18 The Supply of Agricultural Labor. Labor is a major constraint to agricultural output growth especially during peak seasons of labor demand. This constraint is manifested through several developments in the rural labor

10/ According to Islamic law, the estate of the deceased is divided by one-eighth to the surviving wife and seven-eighths to the children, with the stipulation that each female's share is one-half the equal shares of each male heir. State law has set a minimum size of landholding (8 acres) below which an estate cannot be subdivided but the law is not enforceable in the courts since the Islamic law has precedence. What it simply means is that land shares of less than the limit are not recorded in cadastral records. Family custom, however, operates to dilute the effects of Islamic law on land distribution. Family pressure is commonly exerted on female heirs to resign their share of the estate, especially of land.

11/ Data from the FAO also show that while the agricultural labor force increased by about 15% between 1970 and 1980, gross agricultural output rose by 35%. See Asian Development Bank: Agriculture in Asia, Manila, 1985.

market - changes in the composition of agricultural employment, trends in wages, as well as agronomic management practices. It also involves two related issues - the extent of female labor force participation, and the degree to which female labor is available for employment outside their own farms.

6.19 Changes in the composition of agricultural employment between self-employment and hired labor is reflected in the Agricultural Censuses of 1972 and 1980 (Annex 6, Table 4). In 1980, more family workers per cropped hectare lived on smaller farms (less than 10 ha.) compared with 1972. The number of hired workers per hectare decreased markedly during 1972-80. Moreover, the proportion of households using permanent labor decreased, while that of households using casual labor increased. Since permanent workers work more full-time hours than casual workers, the shift from permanent to casual labor implies a decrease in labor intensity. Growth in real wages since the mid-1970s signaled a tightening of the agricultural labor market. Real wage growth for casual labor was nil from 1960 to 1966 and 2.2% during 1966-73. Wages decreased in 1973-74; yet since 1976 they have increased over 5% per annum in real terms. While migration undoubtedly played a part (para.6.23), revitalization of Pakistan agriculture in the mid 1970s is a primary cause of wage escalation.

6.20 Pakistan's agriculture has pronounced seasonal peaks in labor demand. Rice planting, weeding, and harvesting; wheat harvesting and threshing; sugarcane cutting and crushing; gur making; vegetable growing; and groundnut digging -- all are labor intensive operations that may occur simultaneously and create labor shortages. The trend of casual labor wages reflects this, but farm management practices may be more important. For instance, planting rice too sparsely 12/ causes higher disease incidence, waste of chemical inputs, and generally lower yields. Sparse planting and wage rates reflect seasonal labor shortages. Delayed planting of wheat after rice or cotton is further indication of the labor squeeze.13/

6.21 At first glance, low female labor force participation reported in Population Censuses and Labor Force Surveys seems to explain the labor shortage in agriculture, but these surveys under-report female labor force participation in agriculture. Female labor force under-reporting is evident by comparing these with special purpose surveys that targeted women exclusively (Annex 6, Table 5).14/ The latter reveal considerably higher

12/ 10-15 hills per square meter instead of 25.

13/ In the rice-wheat rotation, labor shortages for harvesting, threshing and drying rice often delay wheat planting, which is best done in October, but falls beyond mid-November. In the cotton-wheat rotation, cotton-picking at times trails on until December.

14/ Specialized surveys, the National Impact Survey (NIS), the Pakistan Fertility Survey (PFS) and the Pakistan Contraceptive Prevalence Survey (PCPS), were conducted primarily to examine the patterns of fertility and contraceptive use but they also collected work status information for married women aged 15-49.

labor force participation among women both in the urban, and especially in the rural areas. The differences occur because the general surveys use male enumerators to collect information from male household heads who fail to recognize women's gainful employment at home, while the women-specific surveys used specially trained female enumerators who collected the data on women's activities from female respondents. The Pakistan Censuses of Agriculture showed that women working on their own account increased from 39% to 54% during 1972-80, mainly due to doubling part-time employment (Table 6.6). Male agricultural work on holdings was unchanged. The labor force participation rate of agricultural households is 92.4% and 73.2% for males and females.

6.22 Although women participate in the workforce, they rarely work outside their households. Under 3% of women working in agriculture were employed for wages in 1980, and this proportion may be declining. Gender-based labor market segmentation and rising demand for labor outside agriculture has squeezed the labor supply and increased agricultural wages.

6.23 Migration (internal and international) also slows rural labor force growth. During 1980-85 about 350,000 persons moved each year from rural to urban areas while 125,000 persons went overseas.^{15/} Rural-urban migrants accounted for 30% of urban area growth in Pakistan. Statistics show that these people are mainly working age males looking for employment. The 1979 PLM Survey showed the male/female ratio among rural-urban migrants was 4.3:1. The 1981 Census revealed that 75% of male urban migrants during 1972-81 were over 15 years old. Most international migrants come from rural areas; the Punjab accounts for about two-thirds of migrants now overseas. This overwhelmingly male and working-age flow obviously affects the rural labor supply. Returning migrants from overseas are unlikely to reduce this impact because they usually resettle in cities.^{16/} The age-gender selectivity of the above migration flow suggests that these have an almost one-to-one impact on the rural labor force; they contribute to an estimated reduction of some 2% of the latter between 1981 and 1985. This impact may not diminish in future years; the decline in international migration should be more than offset by the larger flows of rural migrants to urban areas. Hence, migration is likely to prolong the agricultural labor shortage.

6.24 Water Availability and Environmental Degradation. Water is a binding constraint to land extension for agriculture. The limited expansion in area cultivated despite continued increases in water availability ^{17/} is an indication that additions to irrigation water at the extensive margin have come increasingly at greater cost. The greatest scope for further important

15/ Data from the Bureau of Emigration and Overseas Employment, probably underestimates, show the annual outflow of Pakistanis for overseas employment varying from 125,000 to 150,000 persons from the late 1970s to 1983, but declining to under 100,000 by 1985.

16/ The PLM Survey reported that although 31% of the respondent emigrants moved from urban areas, 45% returned to take up residence there.

17/ Since 1947, water availability at farmgate has increased by about 50%, from 64 million acre feet (MAF) to 97 MAF in 1984/85.

TABLE 6.6: WORK PARTICIPATION RATES OF MEMBERS OF
AGRICULTURAL HOUSEHOLDS 1972 AND 1980

(Persons Ageu 10 Years and Over, Percent)

| | 1972 | | 1980 | |
|---------------------------------------|--------------------|--------------------|------|--------|
| | Male | Female | Male | Female |
| Own Account/Agricultural Work | | | | |
| Working Full-Time | 60.4 | 23.4 | 56.0 | 21.0 |
| Working Part-Time | 5.1 | 15.6 | 9.4 | 33.4 |
| Total | 65.5 | 39.0 | 65.4 | 54.4 |
| Own Account/Non-Agricultural Work | 67.4 _{a/} | 40.8 _{a/} | 6.4 | 15.9 |
| Others' Account/Agricultural Work | | | 3.6 | 0.8 |
| Others' Account/Non-Agricultural Work | | | 17.0 | 2.1 |
| Total Work | | | 92.4 | 73.2 |

Note: a/ Includes the category of occasion workers for which
informatior was collected in the 1972 Agricultural
Census alone.

Source: Afzal, M. and Z. M. Nasir (1987): "Is Female Labor Force
Participation Really Low and Declining in Pakistan? A Look at
Alternative Data Sources", Paper presented at the Fourth
Annual Meeting of PIDE, Islamabad, August.

increments in irrigation water supply is likely to lie at the intensive margin of agriculture and will come through better operating policies for the irrigation system, increasing water conveyance efficiency and through better on-farm management. Currently, conveyance losses from river to distributary canal amounts to an estimated 25%, and from the distributary canal outlet to farmers' field to another 40%. 18/ Studies modeling the Indus Basin have demonstrated that better operating policies for the irrigation system can bring about major improvements in operating efficiencies, and hence reduce crop losses.

6.25 Inadequate management of water resources rather than population growth has contributed to environmental degradation through waterlogging and soil salinization. Waterlogging and salinity adversely affect crop yields, and, if serious, reduce land available for cultivation. Acutely waterlogged areas cover a sizeable portion of the Indus Basin; some 10-15% of the total surveyed area has the water table at a depth of 5 feet or less. 19/ (Table 6.7) The extent of waterlogging also fluctuates from month to month, areas with the water table less than 5 feet below the surface doubling between April/June and October. Water spreading (under irrigation) and inadequate canal maintenance have been the main factors contributing to severe water logging and salinity. The diversion of river flows, without adequate drainage and with poor maintenance of the irrigation system, has raised the water table. The construction of the link canals joining the system of the four rivers and the building of other unlined elevated canals further contributed to water seepage and produced waterlogging over wide areas. With inadequate water to leach the soil, salts are deposited at or near the surface. Surface evaporation leads to salinization, a condition which gets progressively worse with further waterlogging, lack of drainage facilities and lack of water to leach the soil. Recent surveys by WAPDA show that the incidence of waterlogging and salinity has increased substantially in the Punjab but also in the Sind where the water table is high and is not pumped for tubewell irrigation because of the unfit (brackish) quality of water. Between 1975 and 1983, the estimated waterlogged area rose 29% to 9 million hectares, the

18/ Of the about 101 maf of surface water presently being diverted into canals of the system, 25 maf is lost in conveyance from the rivers up to the outlet of the distributary canal. The remaining 76 maf are supplemented with another 33 maf of ground water pumped by public tubewells, accounting for a total of 109 maf at the outlet of the distributary canal, from which the water flows on average through about 3 miles of "sarkari Khal" from which the farmers tap the water at points designated as sanctioned "nakkas" and convey it through their own channels to the fields to be irrigated. Only 65 maf reach the farmers' fields. See World Bank: Pakistan: On-Farm Water Management Project (Cr. 1163-PAK), Completion Report, Aug. 1987, p. 2, for a summary of studies on water delivery efficiency.

19/ WAPDA estimates, reported in Pakistan: Report of the National Commission on Agriculture, Ministry of Food and Agriculture, 1988, Chapter 17.

TABLE 6.7: WATERLOGGING AND SALINITY, 1975-86
(million ha.)

| | Area Waterlogged 1/ | | Saline Area |
|----------------------|---------------------|------|-------------|
| | 1975 | 1986 | 1986 |
| Punjab | 1.18 | 0.77 | 1.13 |
| Sind | 1.26 | 1.27 | 1.02 |
| NWFP | - | 0.04 | 0.52 |
| Baluchistan | - | 0.05 | - |
| Pakistan: Total area | 2.44 | 2.14 | 5.81 |
| As % of GCA 2/ | 14.3 | 13.0 | 35.4 3/ |

Notes:

- 1/ Area with water table within 5 feet (approx. 150 cm) of the surface. Depth of water table varies from year to year and within years in relation to precipitation. 1986 figures refer to pre-monsoon situation.
- 2/ GCA = gross canal commanded area. Not all of the GCA is cultivable. In 1975, the cultivable area represented 82% of the GCA.
- 3/ Only about half (54%) of saline land fall within cultivable areas.

Sources: Pakistan: Report of the National Commission on Agriculture, Chapter 17; Pakistan: Agricultural Statistics of Pakistan 1985.

Punjab alone accounting for nearly 60% of this increase.^{20/} Drainage investments, as well as better maintenance of drainage facilities are needed to contain waterlogging. In fresh groundwater areas the government's policy of promoting private tubewell development should contribute to this objective; a public sector role continues to be appropriate in saline groundwater areas.

6.26 While resource management issues rather than population factors lie at the heart of waterlogging and salinity problems, the latter are relevant in identifying causes of Pakistan's loss of rangelands and forests. Although rangeland accounts for over 70% of Pakistan's land, continued overgrazing of forest areas and the arid rangelands has reduced forest to thorn bush thickets and rangelands to desert-like environments.^{21/} Pakistan is estimated to be losing forest resources at the rate of 1% a year and with only 2-4% of the country under forests, future fuel wood sources, ecosystem stability and bio-diversity are major concerns. While the inflow of Afghan refugees over the last decade has undoubtedly exacerbated deforestation and the loss of rangelands, a direct link with overall population pressure is difficult to establish. By the same token, efforts to improve the natural environment, thereby benefitting animal husbandry and forestry activities, would focus on institutions and resource management rather than on the management of population growth.

6.27 Other Constraints. Deficient use and management of inputs (other than water) is an important constraint to agricultural growth. Pakistani agriculture still ranks low in input use relative to other developing countries despite progress during the 1960s.^{22/} Greater use of inputs may increase yields if they are managed properly. Although fertilizer use grew rapidly during 1970-80 (14% p.a. and close to 9% since 1980), crop yields did not. Limited water availability and inappropriate nutrient balance are often cited as reasons for this lack of yield response. The problems are not directly related to population growth. Better input management, and institutional support, particularly research and extension, will produce further yield improvements. Research is hampered by financial and staff problems, weaknesses in research identification and monitoring at the provincial level, and in federal-provincial coordination. Provincial extension services need more and better trained field staff and more efficient information dissemination to farmers. Linkages between research and extension require strengthening, as do mechanisms for monitoring and evaluation. The Report of the National Commission on Agriculture contained specific proposals to remedy these weaknesses and improve agricultural productivity.

20/ See Khan, M.H.(1987). "Pakistan's Agricultural Sector: Performance and Policies, 1971 - 1985," mimeo.

21/ Government of Pakistan (1983): "Pakistan Desertification Problems: Extent and Remedial Measures", Lahore.

22/ For instance, Pakistan's fertilizer use of 76 kg. per hectare in FY86 compares unfavorably with 360 kg. per hectare in Egypt.

Population Growth and Food Balances.

6.28 Whether Pakistan can balance its food supply and demand and increase agricultural exports depends on the growth of population and incomes. Even if food production grows 2.3-3.5% p.a. for a decade that increase would barely cover Pakistan's current rate of population growth (3% p.a.) 23/ let along increase incomes.

6.29 Demand projections have been carried out by the International Food Policy Institute (IFPRI) (Table 6.8). These projections are based on a comprehensive econometric forecasting exercise, based on assumed growth rates of GNP and population and estimated income elasticities - a 5.6% annual growth rate in GNP, consistent with the historical average for Pakistan for the period 1960-85, and population growth of 2.85% p.a. through 1990, dropping to 2.5% thereafter. These population growth rates approximate those of the "low" scenario, detailed in Chapter 2 (para. 2.36).

6.30 As shown in Table 6.8, both projections are noteworthy for their rapid demand growth for many commodities - Basmati, cotton, sugar, edible oils, meat and milk - which average 5% p.a. or more, clearly the consequences not only of population growth but also of increases in projected incomes. For the remainder, the projections are mostly driven by the population growth rate. Hence, per capita demand for wheat, other rice, maize and pulses are expected to remain unchanged through the year 2000.

6.31 While historical rates of growth are useful for projecting demand, they shed no light on the future supply of agricultural output. This is because resource constraints become more important as output expands. The quantity and quality of the land base changes as marginal land (waterlogged and saline areas) is brought into production. Present and future investments also affect the supply of water and other inputs. A consistent framework for projecting future agricultural output growth that takes the above constraints into account is the (Revised) Indus Basin Model (RIBM) (Table 6.9). RIBM projects future crop yields by first analyzing the potential for improving water management, drainage, and salinity control; and increased fertilizer usage. It does not consider other factors -- such as seed and plant protection measures and cultural practices -- that have affected yields in the past. Even so, RIBM's assumed yield growth rates are higher than recent historical averages.24/

23/ This is clear from Table 6.2, which showed no increase in per capita foodgrain availability since 1970.

24/ Investment assumptions govern water supply, its delivery efficiency, drainage, and soil rehabilitation. Illustrative investment assumptions include no resolution of the "water rights" issue before 1992/93, and the construction of Kalabagh. Only those investments that did not depend on the resolution of water rights issues were included. Surface water allocation is made within the model using the rule that no canal command is made worse off.

TABLE 6.8: PROJECTED DEMAND FOR AGRICULTURAL COMMODITIES,
1983/84 - 1999/2000 ^{a/}

| | Est. Demand 1983/84 (mil. tons) | Projected Demand 1999/2000 (mil. tons) | Projected Growth Rate (% p.a.) |
|------------------|---------------------------------------|--|--------------------------------------|
| Wheat | 10.9 | 19.1 | 3.6 |
| Basmati | 0.5 | 1.2 | 5.6 |
| Other Rice | 1.5 | 2.3 | 2.4 |
| Cotton | 0.5 | 3.3 | 6.5 |
| Edible Oils | 0.8 | 2.0 | 5.9 |
| Maize | 1.0 | 1.7 | 3.4 |
| Millet & Sorghum | 0.5 | 0.5 | 0.0 |
| Pulses | 0.6 | 0.9 | 2.6 |
| Meat | 1.1 | 2.9 | 6.2 |
| Milk | 4.7 | 10.2 | 5.0 |

Note:

a/ Low population projection. Refers to demand within Pakistan only.

Source: IFPRI: "The Wheat Economy of Pakistan: Setting and Prospects", January 1987.

TABLE 6.9: PROJECTED FOOD DEMAND-OUTPUT BALANCE,
1992/93 AND 1999/2000 /1

| | 1992/93 | | | 1999/2000 | | |
|--------------|-----------|-----------|-------------------|-----------|-----------|-------------------|
| | Demand /2 | Output /3 | Output/ Demand | Demand /2 | Output /3 | Output/ Demand |
| Wheat | 15.2 | 14.7 | 96.7 | 19.1 | 17.4 | 91.4 |
| Basmati Rice | 0.8 | 1.0 | 125.0 | 1.2 | 1.8 | 150.0 |
| Other Rice | 1.9 | 6.9 | 363.2 | 2.3 | 4.3 | 187.0 |
| Cotton | 2.3 | 5.3 | 230.4 | 3.3 | 5.8 | 175.8 |
| Sugarcane | 50.7 | 10.6 | 20.9 | 69.1 | 56.8 | 82.2 |
| Maize | 1.4 | 0.6 | 42.9 | 1.7 | 1.5 | 88.2 |
| Pulses | 0.8 | 0.2 | 25.0 | 0.9 | 0.0 | 0.0 |
| Meat | 1.8 | 0.4 | 21.6 | 2.9 | 0.6 | 20.7 |
| Milk | 7.4 | 11.8 | 159.5 | 10.2 | 19.8 | 194.1 |

Notes:

- /1 Demand and output in million tons, output/demand in percent.
 /2 Based on low projection. See Tables 2.13 and 2.14.
 /3 Output estimated with government targets imposed. For 1999/2000, it is assumed that investment in the Kalabagh Dam project has taken place. Without Kalabagh, wheat output is 15.4 mil. tons (80.6% of demand) and other rice output is 3.9 mil. tons (169.6% of demand).

Source: Kutcher, G. P. (1987) "Policy Planning in a Resources - Constrained Environment: Pakistani Agriculture in the 1990s," May, mimeo.

6.32 According to RIBM demand and output projections, some minor shortfalls may emerge by 1992/93, but exportable surpluses of traditional export crops - cotton and rice - would remain large (Table 6.9). Wheat production would fall only 3% short of demand, but sugarcane, maize, pulses, and meat would fall more than 50% short. The modest wheat shortfall is largely the result of low water availability during the Rabi (winter) season, but other constraints contribute. In particular, family labor is identified as a constraint in 6 out of the 9 agro-climatic zones covered by the RIBM. The labor constraint would have greater impact on output had the model imposed more rigid limits on hired labor.^{25/} By 1999/2000, wheat output would fall 9% short of demand, reflecting that at 2.5% p.a., projected wheat yields are increasing more slowly than demand. Other projected deficit crops for 1992/93 would also be deficit crops in 1999/2000. Pulses and meat show worse shortfalls than sugarcane and maize, which are projected to meet over 80% of demand. This scenario implicitly assumes that Pakistan's high population will not hurt economic growth. Reduced economic growth would also reduce the demand for food. But rapid population growth would doubtless reduce self-sufficiency for wheat and other foodgrains. Yield growth at historic rates would have a similar effect.

6.33 The RIBM projections indicate that with appropriate investments in agriculture and water, and moderate increases in yields, large surpluses of cotton and rice would continue to be available for exports. The value of rice exports would rise as an increasing proportion of these exports would consist of Basmati rice. The projections, based on the optimization rules for water allocation, also suggest that no significant export diversification of agricultural goods can be expected; exports continue to rely heavily on cotton and rice. However, the inclusion of "high value" crops, potato, onion and chillies in the "optimized" solution of the RIBM are indicative of strong comparative advantage of these crops relative to crops already in the model. Finally, the model provides some insight into prospects for greater oilseed production and hence import substitution of edible oil, revealing (i) that the shortage of cultivable land in some areas and water in others are the limiting factors, and (ii) that not all non-traditional oilseeds, even if agronomically suitable, stand a good chance of adoption by farmers in Pakistan. However, no generalization on aggregate oilseed production prospects is provided.

6.34 The RIBM scenario is less optimistic with higher population growth. The "high" population projection (Chapter 2. para 2.37) implies a larger shortfall in wheat output - about 15% of requirements instead of 9% - by year 2000, and for other food products (about 24%, 18% and 81% for sugarcane, maize and meat). Surpluses of rice, while still large, would be smaller. Wheat and sugar shortfalls have important balance of payments consequences because imports of these items will add to the current account deficit.

25/ The RIBM assumes that where family labor shortages exist, hired labor is used. However, the labor data used in the model are not sufficiently reliable to assess overall labor constraints.

Conclusions.

6.35 To summarize, agriculture and demographic change are related because people are both consumers and producers of agricultural output. But the quantitative impact of population growth is not straightforward. Population growth clearly increases food consumption, so per capita availability of many foodgrains has stagnated despite output growth. For supply, binding constraints will limit the scope for expanding output. At the extensive margin, increments to land and water for cultivation are becoming more expensive. At the intensive margin, rural-urban migration is a response to increasing demand for non-agricultural workers, and is squeezing agricultural labor supply. But labor market shortages are unlikely to continue from the gender-specific labor market segmentation that affected yields and land tenure arrangements. Environmental deterioration (waterlogging and salinity) and the destruction of range lands and forests reduces land productivity. But other factors influence agricultural supply and demand. Income growth and government pricing and input policies can affect demand; and technological and institutional changes can influence supply. Population and income growth will continue to determine the increase in demand for food and other agricultural products. Rising rural wages will give women an incentive to work for wages. However, even a complex model like the RIBM cannot precisely evaluate the impact of population growth. This evaluation is even harder for agricultural exports, since demographic change is only a subset of a complex of variables - economic, technological, institutional, domestic, and international - that affect their prospects.

CHAPTER 7

POPULATION POLICY AND PROGRAMS: PAKISTAN'S RECORD 1/

Introduction

7.01 In Chapter 2 it was shown that the principal determinant of high population growth in Pakistan is sustained high fertility. Experience in other countries has shown that fertility typically falls as development progresses and it can be expected that Pakistan's population too will, in the long run, lower its fertility. However, the costs associated with waiting for fertility to decline at its own pace are high, as discussed in the previous four chapters, and acceleration of the process is therefore desirable. Policy interventions are needed to influence the factors that maintain high fertility. Besides the significant economic and social benefits that would be associated with lowered fertility--and hence from a moderated population growth rate--there are substantial benefits for individual families and particularly for mothers and children that would result from a successful population program.

7.02 Figure 1.3 illustrates the wide range of possible interventions that are available to influence population growth. Within each of the eight intervention opportunities, policies and program can be developed. Together these represent the framework of a comprehensive population policy that seeks to influence fertility through synergistic inputs. In these ways, government can influence population growth. Yet, it must not be forgotten that household decision-making (women's choices in particular) are at the root of high fertility rates. A key goal of any population policy must therefore be to convince families that the costs of high fertility to them are significant and that they would benefit from fewer children.

7.03 Pakistan was one of the first developing countries to adopt an explicit population policy. However, while "it would be impossible to write a history of modern population planning without including Pakistan... by all reasonable standards and criteria, the Pakistani family planning program has been a failure."^{2/} This chapter reviews GOP's population policies and programs, past and present, and assesses their impact and constraints. Since two of the most important elements in explaining continuing high fertility in Pakistan are the low levels of contraceptive use and the high levels of infant and child mortality, the chapter reviews family planning program and Mother and Child Health (MCH) services in some detail. The discussion focuses on why public

1/ This chapter is based on: World Bank, Pakistan: Population and Health Sector Report No. 7349-PAK, Population and Human Resource Division, EMENA, Country Department I, June 28, 1988.

2/ Robinson, et. al. (1981).

programs have largely failed to provide the population with family planning and MCH/basic health care services. It also suggests how short-, medium-, and long-run performance can be improved, focusing on key aspects of program capacity at the district level and below, e.g. management of family planning, and MCH services; staffing and skill levels; use of outreach activities to increase use of public and private services. Since population policy has largely focussed on family planning, and MCH care has largely been subsumed into the provision of basic health services, family planning and basic health services are the foci of this Chapter. Chapter 8 discusses the wider policy implications that flow from this analysis.

FAMILY PLANNING

Historical Overview

7.04 Family planning activities in Pakistan began in 1947 with small-scale voluntary efforts. The Family Planning Association of Pakistan (FPAP) was established in 1953 and the Government first became involved in the late 1950s. Thus, Pakistan was one of the first developing countries to start work in the population field. The late 1950s and early 1960s saw the creation of Family Planning Boards which were established to direct and oversee the family planning program. In 1965, Pakistan became one of the first large developing countries to adopt an explicit population policy with specific fertility reduction goals. Also by 1965, the Boards had developed to the point where they had financial and administrative autonomy from the rest of the health service. At the center of this early public sector initiative were the field staff--in particular the dais (traditional midwives) and part-time agents selling contraceptives--supervised by district population planning officers. Clinical services were offered by Lady Family Planning Visitors, supervised by female medical doctors. Field staff who failed to meet monthly quotas were liable to dismissal. This organization, which entailed a broad supervisory span, unfortunately led to weak management and left few opportunities for supervisors to do on-the-job training and to offer other support to field staff.

7.05 A Committee set up by the Government in 1970 to review the 1960-70 program concluded that the 1960-65 program had had no visible impact, mainly due to scarce resources within the health services, an inadequate organization and extreme social resistance. During the 1965-70 period, however, the program was thought to have had more impact since the crude birth rate was estimated to have declined from 50 to between 46 and 48 per 1000. 3/ The main problems in this phase were pressure to achieve unrealistic targets and indiscriminate spreading of resources irrespective of demand. This led to services of low quality and little effort to stimulate demand in areas (particularly cities) where latent demand existed and could have been stimulated.

3/ This achievement, however, fell short of the target of 41 births per 1000 (Table 7.2).

7.06 In 1973 and 1974 a new system, known as the Continuous Motivation System (CMS) (which had been operating on an experimental basis in Sialkot District since December 1969), was adopted nationwide. This scheme replaced the dais by literate and educated field motivators. These were organized in teams of one male and one female and together they visited couples, motivated them to accept and continue using contraceptive methods, and provided them with contraceptives. During this period a number of basic information, education and communication (IEC) strategies were introduced, two of which relied heavily on mass media. Initially, District Population Officers, with no communication skills and large administrative burdens, were mainly responsible for publicity campaigns in their areas. This was not very successful so a second strategy was tried involving the printing of large amounts of materials for the general public. With a predominantly illiterate population this did not lead to major behavioral changes. The third strategy was an attempt at face-to-face motivation through the CMS. This was never put into practice in any significant way because in 1977 population program activities were suspended. Although the program that was developed from 1973 onward had several well-conceived elements, most components never had an opportunity to be properly tested. To complement the CMS, the Government initiated in 1975, with USAID assistance, 'contraceptive inundation,' which used both Government and private distribution channels for contraceptive supply. In 1977 the Pakistan Family Planning Council was abolished and all official population activities were stopped due to political changes. Between 1977-1980, there was essentially no field work and no motivational campaigns. Although family planning clinics continued to function, they received little support; performance and utilization indicators sank to an all time low.

7.07 In January 1980, responsibility for population programs was transferred from the Ministry of Health to the Ministry of Planning and Development. The Population Welfare Division (PWD) was created and assigned the roles of policy-making, planning and coordination as well as implementation of IEC, training and much of the service delivery load. The reorganization resulted in a reduction in total staff strength (from 16,000 to about 8,300) with the bulk of the reduction involving the dismissal of field motivators. 4/ Key elements of the multisectoral approach adopted in 1980, and still in place today, include (i) a conscious effort to integrate population planning with overall economic planning; (ii) at the field level, supporting community development activities including the establishing of village level councils to oversee the work of each Family Welfare Center; (iii) encouraging the incorporation of family planning activities into the regular work of the provincial departments of health, labor, education and social welfare; and (iv) developing an explicit strategy for and fiscal support to Non Government Organizations (NGOs) in the sector.

4/ Many of these were considered ill-suited for field work and potentially redundant anyway due to new reliance on community councils and volunteers for motivational activities.

Current Status

7.08 (a) Approach. The 'multi-sectoral' approach developed in 1980-81 remains essentially unchanged today and represents a significant shift in the earlier program's exclusive focus on contraceptive supply. A key element of the PWD's strategy has been to supply family planning services through a network of Family Welfare Centers (FWC), whose primary goal is to create conditions favorable to changing reproductive behavior. One method used to enhance FWC staff effectiveness as agents for change is to organize community activities to improve their credibility, such as income generation activities for women. The PWD has focused a 'multi-sectoral' approach, i.e. developing Advisory Management Committees in the villages to oversee each FWC, encouraging provincial health, labor, education and social welfare departments to become involved in family planning activities, supporting the operations of NGOs and commercial distribution of contraceptives 5/ financially and logistically, and offering surgical contraception to women through Reproductive Health Service (RHS) centers in government and private hospitals (only some RHS are PWD run). The PWD has emphasized skill enhancement in such areas as IEC and community involvement by training PWD staff (and others) in its Population Welfare Training Institutes (PWTI). At its Regional Training Institutes (RTI), PWD has offered high quality clinical training programs. In addition, the PWD has set out to improve logistics and supply and strengthen evaluation and monitoring procedures.

7.09 The proposals of the Population Welfare Program for the 7th Plan do not intend to change the strategy, although more emphasis has been placed on integrating family planning in the health structure. In addition to improving the provision of child health care services for children under five, PWD intends to improve the provision of reproductive services for women by: (a) shifting gradually to clinical contraceptive methods (intra-uterine devices, injectables and contraceptive surgery); (b) improving supervision, monitoring and evaluation; (c) providing incentives to families accepting family planning; (d) providing the health department outlets with training, information, education, communications and supplies; and, (e) improving the effectiveness of existing population welfare outlets of PWD as well as other public agencies, non-government organizations (NGOs) and the private sector.

7.10 (b) Organization. PWD and the private sector supply family planning services. Under the 6th Plan, PWD divided its program into 36

5/ Introduced in 1986 and only includes the commercial distribution of condoms to-date.

"projects", each of which is a program or a program component. 6/ PWD, through the Minister for Planning and Development, takes the lead but management of the program has been divided between the federal government and the provinces. Basically the federal PWD agency controls the overall program and manages the support programs while the four provincial authorities, through their Population Welfare Department including their district officials, manage service delivery. More specifically, the federal government controls training (clinical and non-clinical), social marketing, IEC, research, logistics, and monitoring and evaluation. Most of the service delivery projects are in the hands of the provinces and include FWC and RHS's. Many of these activities either did not exist or were not operational in the early 1980s; service delivery points are steadily increasing. For example, by 1988, there were an estimated 1250 operating FWCs and 135 operating RHSs compared to 1000 FWCs and 75 RHSs in 1982/83.

7.11 Communication activities perform a public relations function by trying to make people knowledgeable about population and more receptive to family planning. National and regional radio and television broadcasts are supplemented by printed matter, mobile audio-visual vans and face-to-face encounters. The aim is to mobilize favorable opinion among parts of the planning authorities so that they will support the promotion of family planning practices, mobilize local action groups, remove socio-psychological resistance and encourage the masses to favor small families.

7.12 In the private sector, despite the large private medical sector, few private medical doctors or clinics provide family planning services. The largest private sector provider of family planning services is the FPAP, whose integrated approach was the basis for PWD's current multisectoral strategy. The FPAP relies heavily on volunteers. Its strategy--to establish a network of 500 work units, each staffed by 25 volunteers, to motivate people, develop community activities and raise funds--shows encouraging progress. In 1986, for example, with 133 work units, FPAP served two-thirds again as many people as PWD at about one-tenth the cost. FPAP provides family welfare worker and dal training at FWCs and cooperates with other NGOs and model clinics, hospitals, and target groups (e.g. all-male groups like the Barber's Association). In addition, it is involved in MCH, income-generating and literacy projects.

7.13 The NGO Coordination Council (NGO-CC) was established with government assistance to facilitate the population-related work of small NGOs. In addition to providing technical and administrative assistance, the NGO-CC directly negotiates funding for NGO projects; it also provides part of FPAP's budget. The NGO-CC is still establishing its credibility and needs to assert itself as an autonomous organization rather than as a PWD "project."

6/ It is expected that the number of 'projects' will be substantially reduced in the 7th Plan.

7.14 Social marketing, or marketing of contraceptives (condoms only so far) through private sector channels began two years ago. This program, which currently has 14,000 distribution points plans for a final target of some 50,000 distribution points. First results are promising.

7.15 (c) Service Coverage. The accomplishments in terms of growth of service outlets, though modest, should be placed in historical context. During the 6th Plan, considerable efforts were required to create an effective, specialized public organization to deliver contraceptive services, partly because PWD's staffing policies were in upheaval and partly because of the time it takes to build or rebuild such a multi-faceted organization. The increase in the numbers of private sector outlets are impressive, although they still only provide a small part of the necessary services. This section considers the accessibility of services and their utilization.

7.16 When all Pakistan's family planning efforts are taken together, they are probably available to less than one-quarter of the target population. PWD provides coverage for about 10-12% of the population, while other organizations serve roughly another 13-15%. According to the 6th Plan, PWD services were expected to cover one-third of the population, while other delivery systems such as NGOs, provincial line departments, public sector institutions, and the private sector would cover the other two thirds. These targets were optimistic. Neither PWD nor the other groups established as many family planning outlets as planned and physical coverage remains very poor. Population/facility ratios throughout Pakistan (except for the Federal Areas) are more than double the planning norm of 30,000:1, triple in some areas (Table 7.1). RHS centers, which concentrate mainly on surgical sterilization and IUD insertion, are similarly very thinly spread. 7/ Moreover, the situation is still worse than indicated, since the RHS(B) facilities (about 60% of the total) only offer a restricted level of services. So these already inadequate ratios overstate the availability of publicly provided facilities for surgical contraception (sterilization).

7.17 As to physical accessibility, average walking distances to FWCs range from 9.3 km in Punjab to over 100 km in some parts of Baluchistan. These distances imply that services are essentially unavailable to large portions of the population simply because of time and travel costs required to visit the facilities. Few clients, rural or urban, are willing to travel more than 5 km to a center, and fewer

7/ Even when the potential demand pool is adjusted to account for married women of reproductive age who desire no more children, these reduced ratios (ranging from about 1:37,250 women to 1:75,300) clearly exceed the capacity of current facilities.

TABLE 7.1 AVAILABILITY AND ACCESS TO FAMILY PLANNING OUTLETS, 1987

| Province | Est. No. MWRA ^{1/} (000s) | FWC ^{2/} | RHC(A) ^{3/} | RHC (B) ^{4/} | MWRA/ FWC | MWRA/RHC (A+B) | Average Walking distance to (km): | |
|-----------------|--|-------------------|----------------------|-----------------------|--------------|-------------------|--------------------------------------|--------------|
| | | | | | | | FWC | RHC (A or B) |
| Punjab | 9,750 | 755 | 13 | 44 | 12,920 | 171,050 | 9.31 | 71.02 |
| Sind | 4,030 | 245 | 14 | 29 | 16,450 | 93,720 | 13.53 | 56.70 |
| MWFP | 2,286 | 186 | 5 | 22 | 12,290 | 84,670 | 11.30 | 68.95 |
| Baluchistan | 864 | 49 | 2 | 5 | 17,630 | 123,430 | 47.50 | 235.13 |
| Federal Program | 69 | 13 | 1 | 0 | 5,310 | 69,000 | 26.25 | 24.64 |
| NGOs | | 417 | 15 | 0 | | | | |
| NGO (FPAP) | | 168 | | | | | | |
| Total | 17,000 | 1,833 | 50 | 100 | 9,280 | 113,350 | | |
| Govt. | | | | | | | | |

Notes:

- 1/ Married Women of Reproductive Age.
- 2/ Family Welfare Centers.
- 3/ Reproductive Health Centers run by PMO.
- 4/ Reproductive Health Centers run by other agencies.

than 5 percent of actual users travel more than 10 km. 8/ Moreover, the PWD system risks serving no more potential clients by the end than at the beginning of the 7th-Plan period because very few new facilities are scheduled to be opened. Overall physical accessibility can only be improved by making family planning services available at many more existing facilities, e.g. at all health outlets.

7.18 (d) Utilization. Available data reveal a trend toward increasing numbers of MCH and family planning visits to FWCs, from a 10 and 20 visit-per-month average respectively in 1982-83 to a 30 and 50 visit-per-month average in 1984-85, representing a shift from fewer than one family planning client per day to about 3 per day. But this remains a very expensive way to provide family planning services to a limited number of clients. The data also show that clients go to FWCs for help with 'general ailments,' suggesting that clients perceive FWCs primarily as a (substitute) source of basic health services rather than a source of family planning or MCH care. The other aspects of FWC programs, e.g., the community-based and income-generating programs, are still incipient, although there have been some interesting successes in isolated FWCs. RHS facilities, especially those RHS-As controlled by PWD, are providing an important service, judging by the high percentage of sterilizations they perform. For example, between September 1987 and March 1988, RHS-As performed half of all sterilizations, while RHS-Bs (those not run by PWD) performed 23% and the FPAP about 14%. Overall, in 1987/88 about 73,000 sterilizations were performed. There are indications that the RHS facilities cannot meet the demand for sterilizations. Other programs, such as services provided through provincial line departments and target group institutions, have only increased their service availability slightly.

7.19 In spite of these encouraging trends, data from the recent PCPS show that PWD centers are not the main sources of contraceptives. PWD outlets provide contraceptives to a relatively minor number of family planning users; non-hospital public health facilities account for essentially none. 9/ Yet, family planning demand is apparently high, and much demand is unmet, as measured by the PCPS. (The PCPS results show that 43.4% of all currently married women interviewed did not want any more children. However, only 14.4% of those wanting no more children were currently using any form of contraception, 7.7% had used contraceptives in the past, while 77.9% had never used any contraceptive method--54.5% in urban areas, 85% in rural areas.)

8/ A small-scale population-based survey for rural and urban areas (Semple and Mitha, 1986) showed that awareness and use of FWCs declines sharply with increasing distance.

9/ The PCPS found that among married women of reproductive age, FWCs provided 8.4% of all contraceptives while 'hospitals' and drug stores accounted for 54% and 26% respectively.

7.20 (e) Problems. Despite the major, frequent and often abrupt changes in population policy that have occurred during Pakistan's history, several problems have been common throughout. These are listed below and the most important ones are discussed in the following section on constraints.

1. Frequent changes in administration and organization have created problems for staff and clients alike;
2. Past programs have been heavily supply side oriented and have had a weak demand creation strategy. Efforts to influence demand through IEC and advertising have been poor;
3. Inadequate monitoring and evaluation has resulted in poor use of an important management tool;
4. Very optimistic targets for reduction of the birthrate and contraceptive usage have reduced morale within the program staff. (Table 7.2 presents selected demographic targets);
5. High level political commitment to the population program has oscillated over the years but seldom has been strong. In such circumstances, the ability of the program to attract sufficient resources, to be given a high profile and to mobilize inter-sectoral interest has been frustrated;
6. Staffing, manpower development, and training programs have all been fraught with difficulties. The shortage of rural female staff has been a particular problem;
7. Major deficiencies in family planning service delivery and service utilization have seriously reduced the potential effectiveness of the population program. Failure of Health Department facilities to offer family planning services has been a major drawback to coverage.

TABLE 7.2: SELECTED DEMOGRAPHIC TARGETS OF PAKISTAN PLANS, 1965-1988

| | Crude Birth Rate | Total Fertility Rate | Population Growth Rate | Family Planning Users (% married women) |
|------------------------|------------------------|----------------------------|------------------------------|--|
| Plan Period 1/: | | | | |
| 1965-70 | 41 | 6.3 | 3.6 | 6.5 |
| 1972-77 | 44 | 6.8 | 3.1 | 9.2 |
| 1978-83 | 40 | 5.9 | 2.9 | 9.5 |
| 1983-88 | 36 | 5.4 | 2.6 | 18.6 |

Note:

1/ Targets refer to end of Plan period

Source:

Five Year Development Plans, Government of Pakistan

Constraints on Population Policy and Programs

7.21 Probably the most serious constraint is the environment in which population and family planning programs have been asked to perform. Population programs have attempted to operate in a hostile environment where most of the factors associated with high fertility reinforce each other. Literacy, especially of females, remains very low, infant mortality high, and large portions of the population live in remote villages. Most significantly, cultural traditions place women largely in a domestic role, strongly inhibit open discussion of reproductive events, and strong preferences for male children retard acceptance of family planning methods. These factors will, of course, only change slowly. It is against this background that the efforts of PWD should be judged. From the outset, PWD had an impossible task--to implement a multi-sectoral program without the full cooperation of other key ministries and departments is not feasible under any circumstances. However, other constraints, which are more within the direct influence of PWD and which affect its ability to deliver and manage population programs have charged. Two major ones are: (a) PWD's capacity to manage and implement policy, and (b) ineffective IEC and outreach.

7.22 Management and Organization. PWD has suffered from a number of factors which would have severely tested any existing organization's capacity to successfully manage its programs, let alone a new organization with a new program for which political support was not evident. These factors include: the problematic division of responsibility between the federal and provincial levels; compartmentalization of the program in the 6th Plan into 36 "projects" with different time schedules, approval dates of budgets, and donor reporting requirements; variable levels of skills of officers in similar grades; limited management development programs; and highly complex funding arrangements. 10/

7.23 PWD is in a unique position within the Pakistan public administration system; it is a federally administered program with a mandate, since 1983, to transfer responsibility for field activities to the provinces. Yet, all expenditures are still fully funded from the federal ADP, and real transfer of power has been limited. Federal and provincial compartmentalization causes strains, anomalies, and confusion in the provinces and districts. Two examples make this point. Since the federal level controls training, both clinical and non-clinical, Population Welfare Training Institutes and Regional Training Institutes report directly to PWD in Islamabad. Beyond informal working relationships, provincial officials cannot influence local training except through Islamabad. The federally financed social marketing program for the distribution of condoms operates locally but competes directly with FWCs for clients, a situation that produces less than optimal coordination. Thus, there is a need for a further

10 A number of donors are active in Pakistan's population sector. The major ones are USAID, World Bank, UNFPA, ODA, CIDA and IPPF.

rationalization in the division of the responsibilities between federal and provincial levels, the main objective being that division which facilitates program implementation.

7.24 In addition, PWD suffers from many of the constraints which are common throughout the public administration: decision making is overly centralized; staff incentives for performance limited, and monitoring data are little used. There is a mismatch between the emphasis on control, regulation and accountability and the developmental realities of widely scattered, labor-intensive units that must respond to local needs. Public administration promotions and personnel rules are based largely on seniority, and tend to prevent long-term specialist career development. Due to their special status, PWD staff have a great difficulty advancing within the public administration. Lower ranking staff have almost no career potential.

7.25 Demand Generation and Outreach. Many factors explain the high level of unmet demand for family planning. Limited physical accessibility of public outlets is an important constraint. Perhaps equally important is the lack of private health sector involvement in family planning. Low use levels suggest limited public and private sector ability to provide appropriate information and education about family planning benefits and acceptable quality services to potential users. Two elements stand out: constraints to IEC, particularly direct face-to-face contact with individuals and groups of potential clients, and constraints to strengthening the program's outreach capacity.

7.26 Since 1980, PWD has emphasized IEC strategy which called for intensive use of face-to-face encounters in villages and FWCs, developing audio-visual (AV) materials and AV vans in the districts, a comprehensive mass media effort and strengthening of IEC organization and management. The programs, as originally designed, were over-ambitious and achievements have been limited. The constraints have been: (a) fear of backlash to PWD offending the population, and resulting centralization of all IEC functions; (b) ineffective training; (c) inefficient production modalities; and (d) lack of systematic feedback.

7.27 All mass media messages are rigidly controlled by the requirements to refer them to the Minister for his personal approval. Provincial and district staff feel they have little input in planning and small power to ensure that available materials are appropriate for local audiences; messages are poorly linked with district or interpersonal communication efforts. Current efforts to upgrade skills of district staff through non-clinical training activities are a step forward but skill development at this level needs to be supplemented with the resources like transport and realistic job descriptions and supervisory routines to facilitate interaction with FWC staff. The quality of the production of printed materials is high, given the constraints, although materials are often designed without pretesting or evaluating message content. Supplies of materials to provinces are uneven. Greater use of private contractors could overcome some of these constraints. Finally, IEC work is not systematically planned and evaluated, although procedures for ongoing evaluation have been

designed. Evaluation of message effectiveness at the client level is crucial to refine IEC techniques.

7.28 PWD's outreach capacity is weak mainly because of poor goal definition, but also because of poor staffing and training; lack of systematic outreach; and poor coordination with other agencies. PWD's definition of the role of outreach has been shifting and uncertain. The 6th Plan's goal was to strengthen outreach staff's capacity to stimulate 'community involvement' in service delivery, and to provide ancillary 'social welfare services' to women. However, community participation and Management Advisory Committees rarely function. In the past, management wanted family welfare workers to stay in centers to assure predictable service to potential clients, and to avoid unexplained absence. Demand generation was deliberately passive, partly to avoid perceived risks of intensive outreach/promotional activities and partly due to a belief that word-of-mouth was the best way to attract clients. Family welfare workers have been encouraged to concentrate more on follow-up for current acceptors than on priority target groups or advancing motivational activities. But follow-up is passive and depends on the client's own willingness to visit the clinic, partly because the family welfare workers have no means to get around.

7.29 Staffing patterns at FWCs are not conducive to outreach. It is essential that clinic staff are women but family welfare workers (who are always women) and their female assistants are understandably reluctant to travel alone outside the centers to visit households. Giving them transport and protection, aside from the expense, might mean, on the other hand, that the centers would not function in their absence. Male family welfare assistants do not face the same cultural obstacles to travel and security but are unable to work with women; they are poorly supervised and little real work is expected of them. Making more effective use of this male cadre would enhance FWCs' outreach potential without damaging its ability to function and would improve FWCs' ability to address male-target audiences--a group with which FWCs have little contact at present. Expectations for such an initiative should be modest.

7.30 PWD's ambiguous status in the provinces inhibits coordination between it and other line ministry officials and district staff. Family planning messages could reach large audiences if they were delivered at all health and education outlets, both public and private, throughout the country. Efforts to involve other provincial departments in program development (a form of outreach) rely exclusively on persuasion and suffer from the district staff's inability to offer material 'incentives.' Whatever limited interaction occurs between officials normally depends on a PWD initiative.

7.31 The non-family planning component of PWD's work focusses on MCH. PWD's MCH strategy lacks clear operational rules, and FWC staff poorly understand their role in developing an effective referral network for identifying and managing MCH needs. The potential benefits (e.g., reduced pressure on hospital ob/gyn services, reduced maternal and perinatal mortality) of improved links between health and family welfare activities have yet to be realized.

7.32 Selected NGO's, and particularly FPAP, have demonstrated that the population can be reached and will respond to an IEC mix of culturally sensitive messages and media. Recent surveys report higher levels of knowledge on family planning methods, although not higher levels of contraceptive use. Incentives for traditional birth attendants may encourage them to join family planning programs. Efforts are underway to upgrade their skills. With their established credibility and access, these workers could identify potential family planning acceptors and spread the message that child spacing is a normal part of childbearing practice. But traditional birth attendants should only be one component of outreach programs; other efforts should be carried out in parallel.

Conclusion

7.33 Despite having had a population policy for over 25 years, Pakistan has seen little change in its fertility levels and resulting population growth. The population programs have suffered from frequent reverses and changes in strategy, with none of the earlier programs being allowed to mature and adjust. They have suffered from overcentralization, reliance on supplying contraceptives rather than demand generating strategies, inadequate monitoring and evaluation, unrealistic target setting and a lack of political commitment. PWD's current strategy is closest to a comprehensive population policy as it is based on multi-sectoral involvement and tries to influence fertility behavior by providing e.g. MCH services and income generating projects for women. PWD's service network is, however, thinly spread, and only provides services to some 10-12% of the population. The other public and private outlets serve roughly another 13-15%. Utilization of PWD's services is increasing; however, it is generally used as a substitute health center. Specific outreach to improve MCH, engage in community development efforts and create demand for family planning services remains weak; mass media efforts to create a supportive environment for utilization of family planning services are also weak. PWD suffers from overcentralization at the federal level and has problems with staffing, as most of its staff should be female and female providers face barriers providing effective outreach. The programs' involvement with other than family planning service delivery and IEC interventions is very limited.

BASIC HEALTH SERVICES

7.34 Access to basic health services is important in controlling infant and maternal mortality, two factors which determine population growth directly. Lower infant and child mortality can lead to lower fertility rates through a reduced need for replacement births to achieve a given target number of children and by extending the time between pregnancies. Conversely, lower fertility rates can lead to reduced infant and maternal mortality as longer birth intervals provide improved quality births, better child care and reduced competition for household time and resources. Maternal health services are also an important factor, because they reduce maternal death through better prenatal services and better birth assistance. In addition, healthier women give birth to healthier children and greater spacing of births contributes to

healthier mothers. Thus, the effect of fertility on mortality and mortality on fertility reinforce each other. It is therefore important to assess how Pakistan has managed the provision of Maternal and Child Health (MCH) services in order to reduce infant, child and maternal morbidity and mortality.

7.35 Background: Basic health policy and services developed slowly and unevenly after Independence. During the 1960s and 1970s efforts concentrated on the construction of physical infrastructure, but manpower and institutional management development did not keep pace, with consequent imbalances through underutilization of facilities and high staff vacancy levels. In the mid-1970s, a new scheme of basic health services was initiated to improve the coverage of the rural population and to provide a systematic link between village communities and hospitals. The 5th and 6th Plans announced an array of measures including: a rapid expansion of auxiliary manpower, the development of specialist cadres of doctors, special emphasis on preventive programs, the introduction of user charges, rapid expansion of the private sector and the posting of doctors to rural health facilities.

7.36 Recent Developments and Organization of MCH Services: It was only during the 6th Plan that two programs attempted to improve delivery of MCH services through basic health programs in rural areas. These are the Accelerated Health Program and the Primary Health Care Program. Launched in 1982, the vertically organized Accelerated Health Program (AHP) trained traditional birth attendants (dais), produced and distributed Oral Rehydration Salts (ORS) packages to treat diarrhea, and expanded immunization programs. These programs have been successful. By 1988, about 81% of children 1-2 years have been fully immunized and 64% of expectant mothers immunized with tetanus toxoid 11/; 20,000 dais trained; and between 47% in Baluchistan and 85% of households in rural Punjab now use ORS packets in cases of diarrhea. These programs are managed by the National Institute of Health and implemented by the provinces. They owe their success to sound management and to a well designed mass media campaign that created demand for their services. The AHP has managed to combine central planning, direction and funding with local implementation. AHP's expanded immunization program uses the health infrastructure but has its own staff at vaccination centers in clinical facilities and in outreach teams, its own supervision, training, supplies, and information systems. The ORT program serves the same population of mothers and children and uses the same distribution system.

7.37 The Primary Health Care Program (PHCP), was began to establish integrated health complexes in rural Pakistan. Designed to provide comprehensive preventive, promotional and curative services, each complex was to consist of Rural Health Centers (RHCs) servicing up to ten Basic Health Units (BHUs). BHUs would be supported by community health worker volunteers from the villages. As the focus of local

11/ Preliminary data from survey carried out by WHO in February 1988.

service delivery management, RHCs should improve referral systems. BHUs provide primary health care services, take referrals from community health workers, and provide health education.

7.38 The 1986-90 Five Point Program focused on the social sectors especially in the rural areas, and called for more rural health care centers with mobile staff trained in child-spacing techniques and contraceptives, promising each union council at least one RHC or BHU by 1988. In addition to dispensing treatment, BHUs would immunize, monitor nutrition, diarrhea, malaria and tuberculosis, train birth attendants, and offer school health services and mobile outreach programs. BHU staff would be trained in child-spacing techniques and supplied with a full range of contraceptives. This policy statement reads as a blueprint for successful MCH and family planning services, especially the integration of preventive care, MCH and family planning services. Providing these type of services together promotes the fertility-mortality interaction, which in turn raises the cost-effectiveness of health and family planning programs to levels higher than either in isolation would be able to achieve. By June 1988, 85% of union councils were estimated to have a BHU or RHC but family planning services had not yet been introduced in these health facilities. 12/

7.39 Paralleling the rural health care system is an urban system of 600 hospitals and 61,700 beds composed of teaching hospitals, divisional hospitals, district and tehsil hospitals, and MCH clinics. The hospitals are used for referral, but they provide many MCH services as well since the population often uses the hospital as its primary source of health care.

7.40 Service Coverage and Utilization: Increased coverage of health facilities has greatly improved the population's physical access to health services since the goal of siting BHU/RHCs at about one hour walking distance had largely been achieved by 1988. However, population/facility ratios were considerably higher than the planning norm of one BHU for every 10,000 population, with ratios ranging from 1:45,000 in Sind to 1:12,000 in Baluchistan. Clients walk on average 6.3 km to a BHU or RHC. Access to private doctors and government hospitals is mainly by public transport with government hospital clinics being usually more than two hours travel time away for the average user in rural areas. The commitment to provide one BHU or RHC to every Union Council clearly will make service sites more accessible but planning deficiencies mean that public sector facilities will not necessarily be built where they can best serve the people who need them most.

12/ AHP's activities were supposed to be merged with the BHS in 1986 but, so far, integration has occurred only in Punjab.

7.41 Use of RHCs and BHUs remains generally low albeit with great variation. A GOP survey 13/ that examined inpatient care among RHCs with beds, outpatient visits and usage of MCH centers found an average bed occupancy rate in RHCs of 32.2%. Provincial estimates vary from a high of 85% occupancy in Baluchistan to a low of 14.6% in NWFP. The study also revealed low outpatient attendance at BHUs and RHCs. The average numbers of patients per day at BHU, RHC, dispensary and MCH centers were about 28 (capacity of 50), 85 (capacity of 150), 49 and 6.5, respectively. The study attributes low bed occupancy and attendance rates to staff shortages (particularly high vacancy rates for male and female medical officers and absenteeism), lack of referral links with higher level medical institutions, inadequate nursing services at RHCs, employment of newly graduated medical officers who lack skills in independent case management, and inadequate medical supplies and drugs. Perhaps most important--and absolutely crucial for providing MCH services--is the lack of female staff for female patients and their children. Use patterns are heavily influenced by the sex of the presiding medical and paramedical staff, since patients generally are seen by providers of their own sex. 14/

7.42 Low utilization of the rural public health infrastructure is in part the result of the presence of alternatives. By far the largest provider of health services, although largely of a curative nature, the private sector accounts for 65% of health care spending. According to the 1982-83 National Health Survey, of all households seeking basic health care, 37% preferred private doctors, 20% preferred private chemists, and 8% favored hakeems (traditional healers), even though the average charges for private care are four to nine times higher than the average charges for public care. With regard to antenatal and postnatal health care, which are key elements of MCH, data from the PCPS (1984-85) indicate that neither public primary health facilities nor PWD's Family Welfare Centers are major sources of such care in either urban or rural locations. Among currently married women who had recently had a child and who had received some antenatal care, the PCPS found that the largest group (45%) had attended a hospital, 22% had consulted a private doctor, 16% had seen a dai, and only 6% had attended a public primary health facility (1.5% had attended a FWC) (see Table 7.3) Analogous figures are reported for postnatal care. Another recent survey 15/ found that dais were the overwhelming choice (68%) among pregnant women for antenatal care in their first trimester.

13/ GOP's evaluation of the rural health program, based on a facility survey of RHCs and BHUs taken in 1981 (MOPD, 1984).

14/ In one BHU, for instance, 115 patients visited during the first 15 days of the month. Of these, 83 were female cared for by the resident lady health visitor and the remaining 32 were seen by the male medical officer.

15/ Health Sector in Pakistan: A Finance and Expenditure Study, MOPD, April 1988, Confidential Report.

TABLE 7.3 PERCENTAGE OF CURRENTLY MARRIED WOMEN (19-49 YEARS) WITH CHILDREN WHO RECEIVED PRENATAL CARE BY SOURCE, AND LOCATION.

| | Pakistan | Major Urban | Other Urban | Rural | Punjab | Sind | NWFP | Baluchistan |
|-----------------------|----------|-------------|-------------|--------|--------|--------|--------|-------------|
| ALL | 26.04 | 48.99 | 34.93 | 20.06 | 25.59 | 35.21 | 17.80 | 19.30 |
| Source of Care | | | | | | | | |
| Hospital | 45.15 | 53.91 | 48.54 | 39.99 | 31.82 | 62.29 | 61.06 | 75.51 |
| MCH | 2.56 | 3.68* | 2.74 | 1.99** | 3.40* | 0.25** | 3.82** | 3.53** |
| Family Welfare Centre | 1.49 | 0.78** | 1.45* | 1.83** | 1.07** | 0.50** | 5.67* | 3.15** |
| RHC | 1.93 | - | 0.66** | 3.23* | 2.74* | 0.23** | 2.67** | - |
| Basic Health Unit | 1.74 | 0.87** | - | 2.70* | 2.11* | 0.81** | 0.56** | 6.84** |
| Private Doctor | 22.39 | 29.01 | 23.98 | 18.77 | 21.61 | 26.13 | 21.17 | 8.47* |
| Hakim | 4.06 | - | 1.33** | 6.82 | 6.93 | 0.31** | - | - |
| Dai | 16.05 | 5.95* | 16.23 | 20.59 | 24.43 | 6.86* | 0.34** | 2.03** |
| LHV | 2.79 | 3.91** | 2.00** | 2.51* | 3.93 | 0.45** | 3.56** | 0.47** |
| Other | 1.85 | 1.64** | 3.08** | 1.57** | 1.96** | 2.16** | 1.15** | - |

Source: Pakistan Contraceptive Prevalance Survey, 1984-85

** Sample frequencies 10 or less

* Sample frequencies less than 20.

Note 1. Live birth in 3 years preceeding interview.

7.43 Oversupply and maldistribution of physicians is an unaddressed problem in Pakistan. The MOPD estimated that 19,150 medical doctors practiced privately in 1983, while most of the 14,000 public sector physicians had private practices as well. Most private doctors operate below full capacity and feel they easily could increase their practices by half. Little is known about the amount of MCH, largely curative, care that they provide. Pakistan has an estimated 15,000 private practices and 1000 private clinics, mostly in urban areas and mostly providing curative care.

7.44 In addition to Pakistan's 33,000 medical doctors, some 53,000 traditional healers (7,600 with credentials) also provide health services. While GOP wants traditional practitioners to teach preventive and basic health care practices as well as family planning, little progress has been made so far. Another important health resource are traditional birth attendants, who assist at the great majority of the births and who give some pre- and post-natal care. Pakistan has at least 50,000 traditional birth attendants (assuming every village has at least one), of which 25,000 have already received training under the AHP. In addition, several local and international NGOs have developed successful, but usually small-scale health projects in areas where they operate. These projects usually have a strong MCH focus and their experience should be drawn on in further developing MCH service.

Lessons Learned and Constraints to Improving MCH Services

7.45 Despite Government investments in BHUs, RHCs, and other rural facilities, the primary source of MCH services in Pakistan remains private providers who, generally speaking, are consulted only for curative purposes. The AHP is an effective program that should have effects on infant and maternal mortality. This in turn, but after a time lag, will influence fertility decisions.

7.46 There are four basic constraints which currently prevent more effective provision of MCH services. These are (a) the unclear division of labor and the management problems within the public health service; (b) the unbalanced pattern of expenditures; (c) inappropriate staffing mixes; and (d) the lack of outreach.

7.47 Duplication of services and weak management: Provision of MCH services are scattered throughout public sector facilities. At least four officers have responsibility for different elements of MCH services at the District level. While District Health Officers (DHOs) are supposed to control health matters in their districts, they actually lack the authority to appoint, discipline and train staff, to manage budgets and authorize repairs, or to coordinate district activities. Moreover, their salaries and status compare unfavorably with those of district hospital superintendents. Poor pay for DHOs creates an incentive for them to abandon preventive work and seek higher paying curative jobs.

7.48 Many MCH centers and dispensaries are awaiting upgrading and assimilation into the new structure. Major staffing constraints and

limited training facilities for paramedical staff have slowed BHU and RHC development. The situation is complicated for the time being as existing services run in parallel with the new system. Dispensaries have a different pattern of supervision from RHCs and BHUs and no clear lines of managerial accountability exist between the different levels of the system. Resources for travel, transport and drugs are inadequate at all levels of the health system, staff generally lack authority to make even day-to-day decisions and they suffer from poor incentives and career prospects.

7.49 The population section above includes a discussion of the constraints arising from the general culture of the public administration; these apply equally to the public health services. One specific example of management problems is that basic health staff maintain at least 90 separate registers to record the number of patients seen, stock levels, expenses, etc., expending considerable effort keeping records up-to-date. Ironically, much of the data produced is of poor quality and often never leaves the facility. 16/

7.50 Some isolated, experimental health projects have been successful in developing better management and monitoring systems, and their training methods, staff incentives and information-use patterns should be replicated where possible. 17/ However, improved information gathering and analysis will have little impact if district level decision-making is not encouraged.

7.51 Expenditure Patterns Analysis of past five year plans shows, until recently, a strong bias in expenditures for the hospital and curative sector. But this changed, particularly with the advent of the Five Point Program. During the latter years of the 6th Plan, under the influence of this Program, capital expenditures on rural health, preventive health and nutrition programs is estimated to account for almost 60% of total health development expenditure; most of this expenditure was for the construction of BHUs and RHCs. However, to obtain any returns on this investment the provinces need to increase recurrent expenditures. At present the provinces are not allocating large shares of their budget to preventive and basic health care

16/ For instance, distinct programs (such as immunization) do not integrate their records and deal only with curative care based on outdated disease categories. No attempt is made to document process and/or outcomes of activity. One exception is the expanded program of immunization, which records a useful intermediate process indicator, i.e. the number of vaccinations given, and has a good system of mapping the target population and following up its clients. The success of this program can be traced to clear, measurable targets for staff linked with supervision and incentives that reward performance.

17/ Two examples are the USAID funded Integrated RHC project and the Aga Khan health project.

services. In 1986/87, for example, recurrent budget allocations for basic health/MCH/preventive programs in Sind and Punjab were 14% and 24% of total health recurrent budgets respectively. (In addition local bodies spent about 13% of their recurrent health budget on MCH and preventive care.) One study has estimated that by 1992/93 the current expenditure on primary health care in the provinces would need to account for 70% of the total expenditure for health. According to data from other countries, this would be money well spent since there is substantially greater cost effectiveness of MCH and other non-hospital type expenditures compared to hospital expenditures in reducing infant mortality. 18/ Thus, either larger total allocations are needed for the health sector and/or cost savings are to be made in the hospital sector. As the hospital sector holds more power, and budgets are automatically allocated based on numbers of beds, strong political will be needed to allocate sufficient resources to non hospital expenditures. (The availability of resources for the health sector in the future is discussed in Chapter 4.)

7.52 Health sector manpower At present, Pakistan has one doctor for every 3,000 persons; one dentist for every 64,000; one nurse for every 10,500 (one for every 8 hospital beds); one hospital bed for every 1,650; one paramedical for every 2,000; and one basic health care facility for every 11,500 people. These ratios are among the lowest in Asia. Doctors outnumber nurses by the highly skewed ratio of more than three-to-one. In 1985/86, over 40 percent of the 29,000 public health sector posts were reserved for physicians. 19/ The technical staffing norms for rural facilities vary little between provinces. 20/

7.53 Many rural centers have problems attracting staff at all levels. Staff assigned to far-flung districts are frequently absent, yet civil service codes make replacing 'absconders' difficult, so that many posts do not function. Centers in districts near larger towns and urban centers have similar problems, since staff often prefer to commute to work, thus requiring large amounts of travel time. This practice cuts sharply into actual operating times at each service center. Even recruiting staff from the areas where they live does not always seem to

18/ Barnum, H: "Interaction of Infant Mortality and Fertility and the Effectiveness of Health and Family Planning Programs". PPR Working Paper No. 65, World Bank, July 1988.

19/ Another 2,000 physicians were hired by the public service in 1988 due to special programs designed to alleviate unemployment among physicians.

20/ They essentially include: RHC-eleven staff including 2/3 medical officers, 2 medical technicians (MT) lady health visitor (LHV); BHU-five staff including 1 medical officer and 2 MTs; Dispensary--two or three staff including one compounder; and MCH Centre--3 staff including 1 LHV.

work; the solution may lie in offering them incentives to stay in these areas (e.g. housing, basic amenities and schools in the communities).

7.54 Rural female staff are crucial to an effective MCH program in Pakistan (and to improving current and future public sector facility use) where male doctors and health workers are not able to examine women. The 1981 female staff vacancy rate was 83 percent for women medical officers, 40 percent for lady health visitors, and 25 percent for midwives (the availability of female medical officers has subsequently improved). Rural staffing problems are most acute with respect to female paramedical workers. More recent data (1986) from NWFP show a vacancy rate of 40 percent for lady health visitors and 31 percent for nurses. The problem is a combination of severely restricted supply of qualified girls together with cultural barriers which make it difficult for women to live in remote locations.

7.55 A comprehensive picture of health training is difficult to get, but there were over 9,000 graduates from over 200 institutions in at least 14 different cadres in 1984. Training of health manpower is disorganized and often poorly focussed. For instance, four out of 10 public health schools for lady health visitors are closed, but construction of medical technician training facilities is continuing. Skills taught are often inappropriate for MCH. Medical schools, for example, do not focus on preventive and primary care and doctors have little training in MCH, obstetrics, or family planning methods and no knowledge of teamwork, supervising paramedical staff, or outreach programs. Plans to give medical doctors three weeks of in-service courses in these fields before being posted to BHUs or RHCs seems inadequate, but other new programs offer some encouragement. 21/ On the other hand, training given to lady health visitors, nurses and medical technicians does seem appropriate. Merging dispensaries with BHUs will eliminate staff with long experience in rural areas and dispensary staff should be retrained as medical technicians. Improved and increased training of traditional healers (such as dais and hakeems) could provide another crucial source of rural health manpower. Rather than pursue plans to replace traditional healers, this group, with appropriate training, could spearhead efforts to introduce modern hygiene and preventive health measures. These trusted rural professionals could offer first-line health services, but they need modern method training

21/ Some progress is being made. The Aga Khan Medical School trains its physicians to deal with community basic health services, but its graduates are worried that their degree does not provide them with career prospects. The College of Community Medicine of the University of Punjab has started a set of new initiatives in public health and community medicine, offering a Diploma of Public Health, a Masters degree in Public Health and a Diploma in Maternal and Child Health (for women only, 10 places per year). Other new initiatives in health training (introduced in 1987) are a masters program in hospital administration and a diploma in health education. A recently approved Federal Health Service Academy will provide in-service training to health administrators.

in MCH, family planning, preventive and basic health care to integrate into their own traditional methods. They would also need cooperation from allopathic health care providers who, mostly, require more appreciation of traditional medicine.

7.56 Health sector outreach should inform people about which services are available at which health facilities. At present, the public understands clearly only that all services are available at hospitals. As a result, hospitals are asked to dispense too much primary health care, which is not their role and they have become overcrowded. A specific goal of the 7th Plan is to provide primary and secondary health services closer to current hospital clients in order to decongest these tertiary facilities. Whether this goal will be achieved depends, to a large extent, on public education and a reliable referral system.

7.57 The health system's outreach activities are patchy. While community health volunteers are working in villages with some success, many medical technicians lack the means to visit villages or supervise community health workers. The immunization programs have their own outreach system but, with the exception of Punjab, this is integrated with other outreach programs. Staffing requirements also create constraints. NGOs have experimented successfully with male outreach workers. Female outreach is more difficult because of travel restrictions on female staff and clients. Another impediment to well-managed outreach is the inappropriate training of physicians who are assigned to primary health care facilities. While such physicians typically spend only half their time on preventative care, they generally lack the mobility and know-how to supervise medical technicians and community health workers engaged particularly in preventative outreach.

Conclusion

7.58 GOP recognizes that improving MCH and family planning services is vital to a comprehensive development strategy, and is increasingly perceiving both of these services to be key elements of population policy. Policies in both areas are well defined and programs clearly aim to provide more (but not necessarily higher quality) services. At present, however, the private sector is the principal health service provider. Coverage and use of the public health service is low due to number of factors: an overly centralized management system that conflicts with the needs of a development-oriented health and family planning delivery system; personnel practices that undervalue female staff as service providers especially for MCH services; limited coverage and poor IEC about the benefits and proper use of MCH; and a poorly organized referral system. Despite low use, unmet demand for MCH, including family planning services, exists. Further, the public is generally uninformed about where services are available and about the need to seek preventive care while staff outreach, which could help overcome this, is minimal.

7.59 From the perspective of efforts to moderate population growth there are a number of reasons why GOP should be seriously concerned

about improving the effectiveness of MCH services in particular, and primary health care in general. The most important of these is the close interrelationship between infant mortality, maternal mortality and child spacing. Since it is widely accepted that primary health care services are much more cost effective in reducing infant mortality than hospital based services, there is good reason to concentrate expenditures more in that direction. Moreover, it is now known (see Barnum, op. cit) that the cost effectiveness of both family planning and MCH services is raised when both are offered together because of their mutually reinforcing effects. The conclusion of this points overwhelmingly to the provision of a preventive and curative fully integrated primary health care service, which offers quality MCH and family planning services as one of its highest priorities.

CHAPTER 8

MODERATING POPULATION GROWTH

The Need for Policy Intervention

8.01 Rapid population growth with its associated high fertility imposes high costs on individuals, families and society at large. The costs vary in both nature and timing, and while some are confined to specific groups in a limited time frame, others are broad in both coverage and duration. The costs of high fertility fall heaviest on the most vulnerable members of society -- women, children and the poor. As a result, these groups suffer from a high incidence of morbidity, malnutrition and mortality, low participation in school and poor educational attainment, and are often relegated to low status occupations, low wages (if they are able to work), and low incomes. At the macro-level, the consequences of continuing on a high population growth path are most severe in the following areas:

- o high demand for public services and urban infrastructure calling for increased public expenditure;
- o growing unemployment, underemployment and/or falling real wages;
- o low levels of human capital formation which could result in lower labor productivity and slow adoption of new technologies;
- o lower aggregate household savings which would constrain economic growth.

8.02 As the economic environment changes - especially with the move to an industrial based, urbanized and high income economy - the factors which sustain high population growth typically weaken and both fertility and mortality rates are moderated. This has been the experience of the now-developed countries of Europe, North America and Asia and in time it is likely to also be the experience of Pakistan. The question, however, is whether Pakistan can afford to wait for that time to come. The evidence presented in earlier chapters suggests that it cannot. Moreover, rapid population growth has a momentum of its own - today's babies and children are the next generation's mothers. Both their numbers and the nature of their early development are important factors in shaping the demographic future. More education, more jobs for women and higher incomes, for example, tend to reduce fertility; little or no education, no jobs and low incomes, on the other hand, perpetuate high fertility. In this way, both the causes and the consequences of high population growth spill over from one generation to the next and failure to deal with it and its roots today make it harder to deal with in the future.

8.03 As discussed in Chapter 7, Pakistan was one of first developing countries to recognize the need for policy intervention to accelerate the process of fertility decline. Yet the demographic analysis of Chapter 2 has shown that, despite more than two decades of fertility reduction policy, there has been little change in the total fertility rate. 1/ The detailed analysis of Pakistan's past population policy and programs indicates that many of the policies and programs necessary to achieve a fertility reduction are already in place, and, indeed, have been in place for some years. Two things are now required--(i) to significantly strengthen the implementation of these policies and programs, and (ii) at the highest level of government, to recognize the tremendous advantages in the success of these policies and programs and to give them unequivocal support.

Towards a More Effective Population Policy

8.04 With a more comprehensive population policy that builds upon a concerted effort to inform about and supply family planning services, Pakistan could begin to lower her population growth rate through fertility moderation. Such an achievement would not only have all the advantages associated with lower fertility (and, ideally, lower mortality) but would also result in a smaller size population, lower population density and a less-youthful population structure. But accelerating the process of fertility decline will not be easy, as witnessed by the past. It requires both a strong desire among parents to regulate their fertility and the commitment of government to reduce national fertility. These in turn mean, first and foremost, a broad population policy that operates across several fronts. Family planning, as the key means for regulating fertility, is central to this effort. But population policy does not stop here. As discussed below, the most effective--or comprehensive--population policy goes well beyond this into many other facets of life. Sri Lanka, Indonesia, and Kerala (India), for example, have reduced fertility rates by combining an active family planning program with widespread distribution of education and health services.

8.05 The components of a comprehensive population policy for Pakistan are given in Table 8.1. The discussion below will reveal that although many of these components are currently present in government policy (including the multi-sectoral approach to family planning advocated by PWD), they are not always considered by GOP to be part of population policy. On the other hand, other important components of a comprehensive population policy will be seen to be missing altogether. The array of policy/program interventions listed in Table 8.1 is extensive and some are less appropriate for Pakistan at the present time than others. For example, some are inappropriate for reasons of cultural sensitivity, complexity of design and implementation machinery (certain fiscal measures) and cost to the public sector (social security and pension schemes). On the other hand, it should be stressed at the

1/ There has been some change in the juxtaposition of the determinantsof fertility, and in the infant mortality rate.

TABLE 8.1:
RANGE OF POLICIES/PROGRAMS WHICH
REDUCE FERTILITY

| | Time Lag between Program/Action and Fertility Impact | | |
|--|---|-----------------------------|--------------------------------------|
| | Short-term (0-5 years) | Medium-term (6-10 years) | Long-term (more than 10 years) |
| <u>A: Direct Fertility Control</u> | | | |
| - birth spacing/timing through: contraception, breast-feeding, | X | | |
| - age of marriage | | X | |
| - information, education, communication (IEC) | X | | |
| <u>B: Programs to Reduce Desired Family Size</u> | | | |
| - access to MCH services (including Immunization) | X | | |
| - nutrition programs | | X | |
| - special education for mothers: nutrition, safer childbirth and improved child care environment | | X | |
| - general water and sanitation programs | | X | |
| - Access to formal education (girls & boys) | | | X |
| - Adult literacy programs | | X | |
| - Improvement of the work environment for women: e.g. labor legislation, special facilities/housing for female workers, child care facilities | | X | |
| - Social security, pension programs | | | X |
| - Fiscal policies - e.g. tax relief/ subsidies for small families | | | X |
| <u>C: General development policies:</u> | | | |
| - raised incomes/standard of living: increase the desire for "quality" versus "quantity" of children | | | X |
| - shift to more industrial society (away from agriculture where worksharing, growing own food make additional children both desirable and economical) | | | X |
| - Improved employment opportunities for men/women | | X | |
| - change society's views of the role/status of women | | | X |

outset that there is a minimum essential policy package of synergistic inputs that the country should strive for. In the absence of these, the prospects for an early decline in fertility are not good.

8.06 It is also important to stress at the outset that there is typically a time lag between actions and outcomes. The effects of many of the policy/program interventions outlined below will not be visible for some years to come, because attitudes, traditions and behavior take time to change. Family planning programs can have an immediate effect in those families that already consciously desire to limit their fertility. But in other families, where the notion of limiting family size is presently a foreign concept, much needs to be done before behavioral change can be expected. Programs that reduce infant and child mortality, educate women, facilitate the employment of women outside the home, and anti-poverty initiatives all have an important role to play in these situations, but results are unlikely before some five to ten years. (Table 8.1 shows the expected time lag associated with specific programs.) But in no way should the long gestation period of certain policies be used by Government as an excuse for delayed action. Past inaction has already taken care of the next quarter century--Pakistan's population is destined to at least double. On the contrary, the long gestation period underlines the need for urgency in action today--to arrest the problem before it further deteriorates, before only dictatorial measures will work.

Influencing the Regulators of Fertility

8.07 The major regulators of fertility are incidence and age at marriage, breastfeeding, and use of contraceptives. Of those which data permit the measurement of in Pakistan, rising age at marriage and breastfeeding account for the bulk of past fertility reduction, and contraception has played a very small part. In the future, however, if Pakistan is to achieve a major reduction in fertility, contraception will have to play a critical role. Contemporary evidence from elsewhere in the developing and developed world reveals that fertility declines everywhere have been eventually tied to increasing use of contraception. In a composite of 31 countries which had experienced a total fertility reduction in the order of five births, 70% of that fertility reduction occurred through greater use of contraception. Increased age at marriage and abortion accounted for the other 30%, while reduced breastfeeding worked to increase fertility. 2/ In Pakistan, contraception has accounted for no more than 10% of fertility reduction this far.

8.08 In Pakistan, contraception holds the most promise for fertility reduction. As will be described below, there is relatively little scope for immediate increase in the age at marriage. While breastfeeding should be encouraged, its contraceptive effects are limited to about six months and other countries have found it hard to prevent a decline in breastfeeding as development progresses.

2/ The World Bank: World Development Report 1984, Figure 4.5

8.09 The Age at Marriage is important because it determines the number of years that a woman is exposed to conception. In Pakistan, the legal minimum age for marriage is 16 years and it is generally agreed that the average age at marriage for women must exceed 20 to have a positive demographic impact. But average age at marriage recorded in the 1981 census already shows ages approaching this in both urban and rural Pakistan--21.5 years for urban women and almost 20 years for rural women--and fewer than 30% of women married below the age of 20. This is in sharp contrast with evidence from elsewhere in South Asia and Africa where 50% are typically married before their 20th birthday, but it is above the comparative figure for East Asia and Latin America (20%). The process of development, especially expanding education and job opportunities for women, serves to raise the age at marriage and those governments which have raised the legal age for marriage successfully have usually done so in conjunction with these types of measures. With the possible exception of China, efforts to raise the age of marriage by persuasion and edict have not been successful. Therefore, there is little basis on which to recommend a raising of the legal age of marriage in Pakistan, at least until such time as other incentives--for example, education and employment--voluntarily raise it.

8.10 Breastfeeding has had an important contraceptive effect in Pakistan as displayed in para 2.22, but the effect has been declining in recent years. Experience from other countries suggests that as more women become educated and enter the labor market the estimated mean length of breastfeeding falls. This development could have serious repercussions for Pakistan's fertility rate as the following illustration shows. A series of calculations on the numbers of additional women needed to be contraceptive users to achieve target fertility rates (Table 2.8) reveal that if the mean length of breastfeeding were to fall to 10 months (from 20 months), an additional 600,000 women would need to become contraceptive users between 1990 and 1995 in order to prevent an increase in the birth rate. (Table 8.2) This number represents a substantial 35% of the number of current contraceptive users.

8.11 As a culturally accepted form of contraception and as an important source of infant nutrition, breastfeeding should be encouraged in Pakistan. Women need a supportive environment for the long, frequent and exclusive nursing that best inhibit fertility. Worldwide evidence shows that modern western health care (good prenatal and postnatal care, western-trained MDs and nurses, delivery away from home, nutritional programs with milk supplements), urbanization, female labor participation, and education combine to discourage prolonged breastfeeding. These findings are confirmed for Pakistan 3/. Yet declines in breastfeeding can be reversed, as recent successful

3/ Karim, M.S. and Aquil, A. (1988). "Demographic and Health Situation in the Puniyal Valley, Gilgit District, Northern Areas of Pakistan." Report of a Baseline Survey, conducted in 1986, Department of Community Health Sciences, The Aga Khan University, Karachi, 1988.

TABLE 8.2: ADDITIONAL NUMBERS OF MARRIED WOMEN USING CONTRACEPTIVES TO ACHIEVE FERTILITY TARGETS UNDER DIFFERENT ASSUMPTIONS

(Millions of married women)

| | A Decline in % married (2) Decline in postnatal infertility period (3) Increase in contra- ceptive effectiveness(4) | B No change in % married Decline in postnatal infertility period Increase in contra- ceptive effectiveness | C Decline in % married Decline in postnatal infertility period Increase in contra- ceptive effectiveness | D Decline in % married No change in postnatal infertility period Increase in contra- ceptive effectiveness |
|---|--|---|---|---|
| <u>Additional users</u> <u>between 1990-1995 (1)</u> | | | | |
| (a) Rapid Fertility Decline | 2.915 | 3.291 | 3.023 | 2.441 |
| (b) Slower Fertility Decline | 1.246 | 1.622 | 1.296 | 0.591 |
| <u>Additional users</u> <u>between 2000-2005</u> | | | | |
| (a) Rapid Fertility Decline | 4.121 | 4.794 | 4.405 | 3.551 |
| (b) Slower Fertility Decline | 3.062 | 3.735 | 3.253 | 2.175 |

Notes:

1. In 1985 there were 1.676 m current users of contraceptives.
2. From 80% to 70% of women in 15-49 age group.
3. From 20 months to 10 months
4. From 82.5% to 90.0% of all contraceptive users.

campaigns in industrialized nations have shown. Following a comprehensive analysis of current breastfeeding practices and of other factors which inhibit prolonged breastfeeding, a full scale campaign which explains both the health and fertility benefits of breastfeeding is recommended for Pakistan. This should be mounted in conjunction with other family planning/MCH information campaigns and focus on promoting breastfeeding exclusively for four months and the continuation of breastfeeding after supplemental foods are introduced. This should be associated with a health staff training program/review and revision and consideration of e.g. legislative change to ensure breastfeeding facilities are available in the workplace, and control of breast milk substitutes/supplements.

8.12 Use of contraceptives is currently extremely low in Pakistan. This has to change if Pakistan is going to make any headway in reducing national fertility. To illustrate this point, the numbers of additional users associated with the projected total fertility rates (Table 2.8) have been calculated. Assumptions about age at marriage, breastfeeding and contraceptive effectiveness have also been varied to illustrate their effect on fertility. Results are presented in Table 8.2. Of note at the outset is the large number of additional contraceptive users that are required under either fertility decline scenario. At the absolute minimum, to reduce TFR by two tenths of a point by 1995 and assuming the most favorable conditions for marriage age, breastfeeding and contraceptive effectiveness, an additional 600,000 married women must become contraceptive users. Relaxing the favorable assumptions about marriage age and breastfeeding results in the need for an additional 1.6 million users in order to achieve the same decline in TFR by 1995. Also of note is the variation in numbers of additional users implied by the two different fertility decline projections: as expected, to achieve a rapid fertility decline requires an extraordinary effort to recruit many more contraceptive users. For example, in the period 1990 to 1995, the difference is about 1.7-1.8 million married women -- a number equivalent to the total number of current users. In view of this undisputed need to increase contraceptive usage among married women, the rest of the chapter presents recommendations on how to achieve this in an immediate and effective manner.

Improving the Supply of Contraceptives, Family Planning and MCH Services

8.13 Survey data suggest that there is already an unmet demand for contraception in Pakistan, which suggests that the immediate problem is one of information and supply. Among current users, the majority obtain their contraceptive supplies and services from either a hospital or from a drug store. (PCPS, 1984-85) Up to now in the public sector only PWD centers have supplied contraceptives and services. As indicated in Chapter 7 (para 7.13) these centers are few and far between and serve the needs of no more than 10-12% of the population. Although not extensively utilized, public sector health units and centers offer much wider coverage of the country than PWD centers. However, despite an ECNEC resolution in November 1985 that they should offer family planning services, provincial health facilities have been slow to

implement this service.

8.14 What would raise the level of effectiveness of family planning services most would be its full integration with MCH services. The interaction of fertility and infant mortality has been discussed at some length in this report (Chapters 2, 3 and 7). It follows that the integration of the two key services which are designed to address these problems is desirable. Moreover, because of their mutually reinforcing effects, the cost effectiveness of both family planning and MCH services is also raised when these services are offered together. There are, however, serious institutional barriers to this in Pakistan, some of which pre-date 1980 when family planning was removed from the Ministry of Health to PWD; these problems need to be addressed formerly and constructively with the necessary organizational arrangements being detailed on how the departments will work together.

8.15 Action to pursue family planning services in health outlets will be frustrated until health personnel are fully trained in this field, given full responsibility to deliver the service and are supported by enhanced supervision and logistics. This is a major undertaking but a very necessary one. It is also very important to enhance the availability and quality of MCH services and to encourage the use of those services, particularly by those most in need--the poorest and the least educated women. In turn, this means that the rapid expansion of basic health service facilities in recent years and the success of the AHP should be built upon. Thus, for example, steps are required to maximize the availability of female paramedical staff at all health outlets; to maintain the AHP type of outreach service; and to emphasize maternal care, nutrition, education and drugs in the wider health programs. The information base on Pakistan's maternal and neonatal position is particularly weak, and this needs to be remedied. The ultimate objective is to see high quality family planning services offered as a routine but very high priority part of all MCH services; mother and child health is dependent on effective family planning.

8.16 The need to integrate family planning and MCH services is equally appropriate for the private sector providers of family planning and health services -- in the main, the NGOs, the private practitioners and dais. While the former have in some instances already adopted this approach with some success and which offer useful lessons, private practitioners remain singularly concerned with curative health. They too should be given every encouragement, perhaps a subsidy, and trained to adopt an integrated family planning/MCH approach.

8.17 The dai should be at the center of all MCH/family planning programs. The dai training programs currently in place should be evaluated and extended. Improved co-ordination between the separate dai programs and concerted attempts to better utilize and support trained dais are required.

8.18 There is also an important role for an expanded commercial distribution of contraceptives. First results from the social marketing of condoms are promising. This should be continued and broadened to include, inter alia, oral contraceptives. A necessary prerequisite for

such programs is that they are not excessively restricted, particularly in their advertizing. The experience of other islamic countries that have successful social marketing programs (e.g. Bangladesh, Egypt) should be drawn on. Since there is evidence that present demand for contraceptive surgery is not being met, additional full-time reproductive health service centers are required (as envisaged in the Seventh Plan) while ensuring that quality services are maintained.

8.19 Even with a fully integrated family planning/MCH service, more needs to be done to achieve the contraceptive prevalence targets outlined above. (Bangladesh, for example, has achieved contraceptive prevalence rates of over 25%.) Women need to be actively sought out in their homes, communities and work places and motivated to delay marriage and childbirth, and informed about the benefits of smaller families, family planning alternatives and where to obtain family planning/MCH services. This is the role of IEC and outreach.

8.20 A more active outreach program will be severely constrained by the difficulties female staff face in travel and security. How this can be reduced at acceptable cost requires careful investigation. Ways to make more productive use of existing male field cadres should be explored, although expectations for improvement should be modest. Males living in urban areas should be a particular target group. Any substantial active outreach program would necessitate a significant (re)training program, resources for mobility and probably for additional staff.

8.21 Until quite recently, efforts to influence and inform demand for family planning through IEC, advertising and outreach have been weak. Building on lessons learned from early mistakes, PWD has been careful in its programs to avoid sensitive issues which arouse opposition. As such, opposition to family planning messages appears to have lessened and there has been a marked increase in people's awareness of family planning issues in general and knowledge about different contraceptive methods. However, more publicity is given to methods that are suited to women who have completed their desired family size - e.g. sterilization. More emphasis needs to be given to methods suited to the postponement of a first birth (e.g. the pill) and to the prolonged spacing of subsequent births (e.g. the pill, IUD and injections).

8.22 The time now seem appropriate to switch to a more high profile, active and promotive IEC program and to ensure that such an approach is operationalized. It should also be fully integrated with messages stressing the importance of childspacing for infant, child and maternal health. As at present, all forms of media should be used to reinforce the messages but with a more open and direct approach; mass media and especially radio and television are important ways of reaching women. A prerequisite is that central control of the IEC program is relaxed and that more scope is given for local initiatives and messages. Breastfeeding promotion should be given priority and more health oriented materials and particularly those stressing the maternal health aspects, developed; materials that are suitable for supporting field worker outreach and follow-up work should be a focus. Current efforts to train staff in IEC related aspects of their work should be continued

and upgraded. In parallel with such a campaign, health and population education activities should be introduced to the primary school level and strengthened in the secondary levels through curricula review and further materials development. Overall, such a wide-ranging initiative will require good coordination and cooperation between the agencies concerned and a sustained commitment at the highest level to the campaign's objectives.

8.23 Organizational and Financial Implications Achieving the ambitious declines in the fertility rate discussed in Chapter 2, will require a strong and sustained effort by the government and the private sector over at least the next fifteen years to give the necessary momentum to the start of the fertility fall. This will not only require an active family planning program offering high quality services, but also progress on many of the other various topics discussed above and particularly in the field of maternal and child health care. This will be a major challenge. Present government policy, as summarized in the Sixth and Seventh Plans, recognizes many of these factors and particularly the need for the multi-sectoral approach. However, experience has shown that it is often those activities beyond the direct control of PWD where implementation has lagged particularly badly, although the general record of implementation of the population program in the Sixth Plan has not been encouraging. Major reorganizations are not justifiable or needed at this stage. What is essential, however, is a system which ensures that, stemming from a greatly enhanced degree of national and provincial political commitment, sustained coordination and accountability for program progress is introduced. One way of doing this is through an active national top level political/senior official/private sector committee which meets regularly and has the authority to take major program decisions and to ensure that they are implemented across all the sectors concerned. (Such a committee exists but has never met.) On a more operational level steps required include: financial procedures streamlined; the population program made part of the regular activities of government; delegation of authority to provinces and districts increased and the distribution of responsibilities between provincial and federal levels rationalized; monitoring and evaluation capacity, including the management information system strengthened; manpower policies reviewed with career structures and development introduced; and the NGO Coordination Council made more independent.

8.24 Many of the activities discussed above will cost little additional resources to undertake and/or are already included in the Seventh Plan in one form or another. The total cost of the population program as such in the plan is about \$38 million per year, which is very modest in relation to the budgets of many other departments. The expensive additional items discussed above are likely to be a greatly enhanced IEC program, additional field supervisory and support staff especially for program outreach, and additional consumer supplies (including contraceptives) and transport. Making a specific estimate of additional cost is not possible at this stage, but since the proposed activities generally use existing facilities, staff and programs it is unlikely that, even under the most favorable program implementation assumptions, a budget increase of more than 50% of present levels would

be needed by the end of the Seventh Plan period. Even this, relative to the potential impact on Pakistan's further development, would represent good value.

Other Measures

8.25 Low education and literacy of women is an important determinant of high fertility in a number of indirect ways. These are discussed throughout this report and summarized in paragraph 4.06. Moreover, education is an area where government intervention is possible and which has a good chance of success, albeit in the longer run. In emphasizing rural primary education for girls, the Five Point Program made a good start, but the program focused too much on school buildings and not enough on the availability of female teachers and quality education. Female teachers are a crucial bottleneck that inhibits girls' access to primary education and the recruiting and training of female teachers should receive the highest priority.

8.26 Findings presented in Chapter 3 suggest that the care of small children may conflict with school attendance for older girls. The school system will have to take this into account and, in some instances, incentives may be necessary to encourage girls from the poorest families to attend school. In addition, although desired fertility declines with and MCH practice improves with but a few years of schooling, data from elsewhere in the developing world show that fertility rates typically fall only when girls have completed secondary school; expanding middle and secondary education for girls and expanding the open university radio extension program should also be priorities. Despite the importance of formal education, illiterate women can be helped to change their reproductive behavior and protect their families from disease if they have the necessary information.

8.27 Expanding employment and income-generating opportunities for women are complementary to education. As education extends to the girls of Pakistan, their labor market participation is likely to increase and this in turn will have a depressing effect on fertility. The process by which employment reduces fertility is complex, but it has at least two strands to it: its effect on age at marriage and the opportunity cost of women's time once engaged in the labor market. At present both these effects are weak because Pakistani society's strongest role models for girls are those of mother and mother-in-law. With the labor market segregated by gender, women must be aware of employment opportunities (especially in health and education) in order to create tangible incentives for them to want an education.

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Table 1: Low Population Projections

End of Data for Case 1
Pakistan Population with NRR=1 by 2030 (Thousands) (Low)

| Age Group | 1985 | 1990 | 1995 | 2000 | 2005 | 2010 | 2015 | 2020 | 2025 | 2030 |
|------------------|--------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Total M+F | 96180 | 109784 | 124321 | 140001 | 156971 | 174906 | 192992 | 210442 | 226734 | 241570 |
| MALES | | | | | | | | | | |
| 0-4 | 9016 | 9342 | 9778 | 10362 | 11072 | 11666 | 11872 | 11710 | 11326 | 10843 |
| 5-9 | 7253 | 8721 | 9079 | 9546 | 10155 | 10889 | 11511 | 11750 | 11616 | 11255 |
| 10-14 | 6094 | 7172 | 8638 | 9004 | 9477 | 10091 | 10831 | 11460 | 11707 | 11581 |
| 15-19 | 4634 | 6013 | 7090 | 8552 | 8926 | 9405 | 10023 | 10769 | 11404 | 11658 |
| 20-24 | 3979 | 4527 | 5903 | 6983 | 8441 | 8822 | 9308 | 9935 | 10687 | 11330 |
| 25-29 | 3425 | 3857 | 4419 | 5793 | 6873 | 8322 | 8714 | 9210 | 9846 | 10605 |
| 30-34 | 2972 | 3312 | 3756 | 4327 | 5693 | 6768 | 8212 | 8615 | 9121 | 9765 |
| 35-39 | 2569 | 2865 | 3215 | 3666 | 4239 | 5590 | 6661 | 8100 | 8515 | 9031 |
| 40-44 | 2216 | 2464 | 2765 | 3118 | 3570 | 4139 | 5473 | 6539 | 7972 | 8398 |
| 45-49 | 1914 | 2107 | 2355 | 2656 | 3007 | 3453 | 4016 | 5327 | 6384 | 7803 |
| 50-54 | 1612 | 1792 | 1982 | 2226 | 2520 | 2864 | 3301 | 3854 | 5130 | 6169 |
| 55-59 | 1360 | 1471 | 1644 | 1827 | 2061 | 2344 | 2674 | 3097 | 3631 | 4855 |
| 60-64 | 1108 | 1193 | 1297 | 1457 | 1628 | 1847 | 2110 | 2422 | 2820 | 3326 |
| 65-69 | 856 | 914 | 990 | 1084 | 1226 | 1379 | 1573 | 1811 | 2094 | 2456 |
| 70-74 | 604 | 643 | 692 | 756 | 834 | 951 | 1078 | 1241 | 1442 | 1682 |
| 75+ | 756 | 704 | 716 | 761 | 832 | 925 | 1055 | 1215 | 1418 | 1673 |
| Total | 50367 | 57098 | 64320 | 72118 | 80554 | 89455 | 98413 | 107054 | 115112 | 122430 |
| FEMALES | | | | | | | | | | |
| 0-4 | 8504 | 8877 | 9333 | 9928 | 10644 | 11237 | 11448 | 11280 | 10898 | 10420 |
| 5-9 | 6492 | 8178 | 8600 | 9103 | 9737 | 10487 | 11116 | 11358 | 11214 | 10850 |
| 10-14 | 5441 | 6407 | 8090 | 8525 | 9040 | 9683 | 10442 | 11080 | 11329 | 11192 |
| 15-19 | 4618 | 5360 | 6328 | 8009 | 8456 | 8980 | 9633 | 10400 | 11044 | 11300 |
| 20-24 | 3886 | 4520 | 5267 | 6239 | 7918 | 8377 | 8912 | 9575 | 10350 | 11003 |
| 25-29 | 3292 | 3784 | 4423 | 5176 | 6151 | 7825 | 8296 | 8843 | 9515 | 10299 |
| 30-34 | 2743 | 3196 | 3693 | 4335 | 5090 | 6066 | 7736 | 8219 | 8776 | 9457 |
| 35-39 | 2332 | 2655 | 3109 | 3608 | 4252 | 5007 | 5983 | 7648 | 8141 | 8707 |
| 40-44 | 1966 | 2248 | 2572 | 3025 | 3524 | 4166 | 4921 | 5895 | 7551 | 8053 |
| 45-49 | 1646 | 1885 | 2165 | 2488 | 2937 | 3433 | 4070 | 4821 | 5788 | 7431 |
| 50-54 | 1372 | 1560 | 1795 | 2071 | 2389 | 2831 | 3321 | 3950 | 4692 | 5649 |
| 55-59 | 1097 | 1275 | 1458 | 1687 | 1956 | 2267 | 2698 | 3177 | 3792 | 4520 |
| 60-64 | 869 | 987 | 1155 | 1330 | 1549 | 1807 | 2107 | 2520 | 2982 | 3577 |
| 65-69 | 640 | 741 | 850 | 1003 | 1166 | 1368 | 1609 | 1888 | 2273 | 2708 |
| 70-74 | 457 | 501 | 587 | 681 | 813 | 954 | 1131 | 1341 | 1588 | 1929 |
| 75+ | 457 | 512 | 575 | 673 | 796 | 961 | 1155 | 1394 | 1688 | 2044 |
| TOTAL | 45813 | 52686 | 60001 | 67882 | 76417 | 85451 | 94579 | 103388 | 111623 | 119140 |

ANNEX I: Detailed Population Projections, 1985-2030

Table 2: High Population Projections

PAKISTAN Population with NRR=1 by 2050 (Thousand) (High)

| Age Group | 1985 | 1990 | 1995 | 2000 | 2005 | 2010 | 2015 | 2020 | 2025 | 2030 |
|------------------|--------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Total M+F | 96180 | 111638 | 130115 | 151293 | 175556 | 202882 | 232664 | 263654 | 295409 | 328433 |
| MALES | | | | | | | | | | |
| 0-4 | 9016 | 10292 | 11821 | 13226 | 14868 | 16549 | 17946 | 18746 | 19363 | 20294 |
| 5-9 | 7253 | 8721 | 10004 | 11541 | 12962 | 14622 | 16329 | 17762 | 18596 | 19242 |
| 10-14 | 6094 | 7172 | 8638 | 9521 | 11458 | 12881 | 14545 | 16257 | 17697 | 18539 |
| 15-19 | 4634 | 6013 | 7090 | 8552 | 9835 | 11370 | 12795 | 14461 | 16177 | 17623 |
| 20-24 | 3979 | 4527 | 5903 | 6983 | 8441 | 9721 | 11253 | 12682 | 14352 | 16072 |
| 25-29 | 3425 | 3857 | 4419 | 5793 | 6873 | 8322 | 9601 | 11135 | 12568 | 14241 |
| 30-34 | 2972 | 3312 | 3756 | 4327 | 5693 | 6768 | 8212 | 9492 | 11027 | 12465 |
| 35-39 | 2569 | 2865 | 3215 | 3666 | 439 | 5590 | 6661 | 8100 | 9382 | 10918 |
| 40-44 | 2216 | 2464 | 2765 | 3118 | 370 | 4139 | 5473 | 6539 | 7972 | 9253 |
| 45-49 | 1914 | 2107 | 2355 | 2656 | 3007 | 3453 | 4016 | 5327 | 6384 | 7803 |
| 50-54 | 1612 | 1792 | 1982 | 2226 | 2520 | 2864 | 3301 | 3854 | 5130 | 6169 |
| 55-59 | 1360 | 1471 | 1644 | 1827 | 2061 | 2344 | 2674 | 3097 | 3631 | 4855 |
| 60-64 | 1108 | 1193 | 1297 | 1457 | 1628 | 1847 | 2110 | 2422 | 2820 | 3326 |
| 65-69 | 856 | 914 | 990 | 1084 | 1226 | 1379 | 1573 | 1811 | 2094 | 2456 |
| 70-74 | 604 | 643 | 692 | 756 | 834 | 951 | 1078 | 1241 | 1442 | 1682 |
| 75+ | 756 | 704 | 716 | 761 | 832 | 925 | 1055 | 1215 | 1418 | 1673 |
| Total | 50367 | 58048 | 67288 | 77895 | 90047 | 103725 | 118623 | 134140 | 150052 | 166613 |
| FEMALES | | | | | | | | | | |
| 0-4 | 8504 | 9780 | 11284 | 12673 | 14293 | 15941 | 17307 | 18058 | 18632 | 19504 |
| 5-9 | 6492 | 8178 | 9476 | 11005 | 12429 | 14082 | 15768 | 17170 | 17952 | 18549 |
| 10-14 | 5441 | 6407 | 8090 | 9394 | 10929 | 12360 | 14022 | 15717 | 17126 | 17916 |
| 15-19 | 4618 | 5360 | 6328 | 8009 | 9318 | 10857 | 12296 | 13965 | 15667 | 17083 |
| 20-24 | 3886 | 4520 | 5267 | 6239 | 7918 | 9230 | 10775 | 12222 | 13899 | 15608 |
| 25-29 | 3292 | 3784 | 4423 | 5176 | 6151 | 7825 | 9141 | 10691 | 12146 | 13830 |
| 30-34 | 2743 | 3196 | 3693 | 4335 | 5090 | 6066 | 7736 | 9056 | 10610 | 12072 |
| 35-39 | 2332 | 2655 | 3109 | 3608 | 4252 | 5007 | 5983 | 7648 | 8971 | 10527 |
| 40-44 | 1966 | 2248 | 2572 | 3025 | 3524 | 4166 | 4921 | 5895 | 7551 | 8874 |
| 45-49 | 1646 | 1885 | 2165 | 2488 | 2937 | 3433 | 4070 | 4821 | 5788 | 7431 |
| 50-54 | 1372 | 1560 | 1795 | 2071 | 2389 | 2831 | 3321 | 3950 | 4692 | 5649 |
| 55-59 | 1097 | 1275 | 1458 | 1687 | 1956 | 2267 | 2698 | 3177 | 3792 | 4520 |
| 60-64 | 869 | 987 | 1155 | 1330 | 1549 | 1807 | 2107 | 2520 | 2982 | 3577 |
| 65-69 | 640 | 741 | 850 | 1003 | 1166 | 1368 | 1609 | 1888 | 2273 | 2708 |
| 70-74 | 457 | 501 | 587 | 681 | 813 | 954 | 1131 | 1341 | 1588 | 1929 |
| 75+ | 457 | 512 | 575 | 673 | 796 | 961 | 1155 | 1394 | 1688 | 2044 |
| TOTAL | 45813 | 53589 | 62827 | 73398 | 85509 | 99157 | 114041 | 129514 | 145356 | 161820 |

TABLE 3: DEMOGRAPHIC ASSUMPTIONS AND VITAL RATES ASSOCIATED WITH FERTILITY PROJECTIONS

| <u>YEAR</u> | <u>1990</u> | <u>1995</u> | <u>2000</u> | <u>2005</u> | <u>2010</u> | <u>2015</u> | <u>2020</u> | <u>2025</u> | <u>2030</u> | |
|--------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|------|
| BIRTH RATE | 39.6 | 36.1 | 33.5 | 31.5 | 29.4 | 26.8 | 23.9 | 21.1 | 18.7 | |
| DEATH RATE | 12.6 | 10.9 | 9.7 | 8.7 | 7.8 | 7.1 | 6.5 | 6.2 | 6.1 | |
| RATE OF NAT. INC. | 2.70 | 2.51 | 2.38 | 2.29 | 2.16 | 1.97 | 1.73 | 1.49 | 1.27 | |
| NET MIGRATION RATE | -0.5 | -0.3 | -0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| GROWTH RATE | 2.65 | 2.49 | 2.38 | 2.29 | 2.16 | 1.97 | 1.73 | 1.49 | 1.27 | |
| TOTAL FERTILITY | 5.900 | 5.226 | 4.628 | 4.099 | 3.631 | 3.216 | 2.848 | 2.522 | 2.234 | |
| NRR | 2.290 | 2.099 | 1.918 | 1.748 | 1.587 | 1.437 | 1.296 | 1.163 | 1.041 | |
| e(0) - BOTH SEXES | 55.82 | 57.78 | 59.77 | 61.71 | 63.61 | 65.43 | 67.19 | 68.76 | 70.17 | |
| E(10) - BOTH SEXES | 54.71 | 55.77 | 56.85 | 57.92 | 58.97 | 59.97 | 60.97 | 61.91 | 62.82 | |
| IMR - BOTH SEXES | 90.2 | 80.8 | 71.5 | 62.8 | 54.7 | 47.1 | 39.7 | 33.5 | 28.2 | |
| q(5) - BOTH SEXES | 0.1287 | 0.1136 | 0.0990 | 0.0854 | 0.0725 | 0.0606 | 0.0497 | 0.0409 | 0.0339 | |
| DEP. RATIO | 93.9 | 92.4 | 87.3 | 78.2 | 72.2 | 67.7 | 63.3 | 58.3 | 53.1 | 48.3 |

PAKISTAN POPULATION WITH NRR = 1 BY 2030 (THOUSANDS) LOW

| | | | | | | | | | | |
|--------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|
| BIRTH RATE | 43.3 | 42.3 | 40.2 | 38.5 | 36.7 | 34.2 | 31.1 | 28.2 | 26.3 | |
| DEATH RATE | 12.9 | 11.4 | 10.0 | 8.8 | 7.7 | 6.8 | 6.0 | 5.5 | 5.1 | |
| RATE OF NAT. INC. | 3.03 | 3.09 | 3.02 | 2.97 | 2.89 | 2.74 | 2.50 | 2.27 | 2.12 | |
| NET MIGRATION RATE | -0.5 | -0.2 | -0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| GROWTH RATE | 2.98 | 3.06 | 3.02 | 2.97 | 2.89 | 2.74 | 2.50 | 2.27 | 2.12 | |
| TOTAL FERTILITY | 6.500 | 6.322 | 5.938 | 5.517 | 5.055 | 4.546 | 3.987 | 3.517 | 3.199 | |
| NRR | 2.523 | 2.537 | 2.458 | 2.348 | 2.206 | 2.029 | 1.812 | 1.621 | 1.491 | |
| e(0) - BOTH SEXES | 55.82 | 57.78 | 59.77 | 61.71 | 63.61 | 65.43 | 67.19 | 68.76 | 70.17 | |
| E(10) - BOTH SEXES | 54.71 | 55.77 | 56.85 | 57.92 | 58.97 | 59.97 | 60.97 | 61.91 | 62.82 | |
| IMR - BOTH SEXES | 90.2 | 80.8 | 71.5 | 62.8 | 54.7 | 47.1 | 39.7 | 33.5 | 28.2 | |
| q(5) - BOTH SEXES | 0.1287 | 0.1136 | 0.0990 | 0.0854 | 0.0725 | 0.0606 | 0.0497 | 0.0409 | 0.0339 | |
| DEP. RATIO | 93.9 | 95.6 | 96.0 | 92.5 | 88.9 | 84.6 | 80.2 | 74.5 | 68.3 | 62.7 |

PAKISTAN POPULATION WITH NRR = 1 BY 2050 (THOUSANDS) HIGH

Data Sources for Fertility

1. Data for demographic analyses have been drawn from a variety of sources. The vital registration system in Pakistan is very deficient and the need for the estimation of vital rates requires data additional to those normally collected in censuses. Thus, primarily as a substitute for registration of births and deaths in the population, several sample surveys have been conducted in Pakistan. The first was the Population Growth Estimation Experiment (PGE), carried out in 1962-5. The Population Growth Survey (PGS) was another experiment which began in 1968 and was designed to collect data by periodic surveys using overlapping reference periods, so that each event should have been recorded in two successive rounds. Surveys were carried out between 1968-71 and 1976-79. Both the PGE and PGS provide measures of fertility and mortality.
2. Although sufficient data had been collected up to the 1960s for it to be established that there had been little or no change in fertility, a data set which would bring together some of the major correlates of fertility behavior and relate them at an individual or a family level was needed. Fertility estimates available thus far were national ones. The first major attempt to examine the variables behind fertility levels and differentials was the National Impact Survey (NIS), 1968-69. The NIS collected detailed birth histories of 2,910 currently married women from which it was possible to reconstruct fertility rates for different periods in the past, as well as information on attitudes and practice of contraception. The 1972 census was restricted to a relatively small number of questions, and so it was followed in 1973 by a large-scale sample survey, known as the Household Economic and Demographic Survey (HED). This survey included questions on the number of children ever born by ever married women and on births during the twelve months before the survey.
3. In response to the need to evaluate the official population program, initiated in 1965, and to assess any changes in fertility, the Pakistan Fertility Survey (PFS) was undertaken in 1975. This had a larger national sample of 4,949 ever-married women, and contained birth and marriage history data. As social and economic characteristics of the sample of ever-married women were also collected, the PFS provided a good opportunity to incorporate into fertility analysis in Pakistan background factors such as residence, education, work participation and to relate them to an individual's marriage history, birth history, infant and child mortality and contraceptive history data. In 1979 a Population, Labor Force and Migration Survey (PLM) of more than 10,000 households was launched. This survey collected fertility data in a similar format to the PFS, along with detailed modules on labor force, migration and income. This approach provided an opportunity to observe, five years after the previous survey, changes in fertility, infant and child mortality and nuptiality. The 1981 Census also included questions (asked of a 10% sample) similar to those in the HED. The Pakistan Contraceptive

Prevalence Survey (PCPS) of 1984 was primarily designed to collect information on contraceptive use but it also included questions on the number of children ever born by currently married women, and on births occurring during the 12 months before the survey, from which fertility rates have been calculated. Finally, the Pakistan Demographic Survey (PDS), also conducted in 1984, was a multi-round survey similar to the PGS.

TABLE A 2.1: AREA, POPULATION, DENSITY AND HOUSEHOLD
SIZE BY PROVINCE: 1981

| Province | Area (Sq. Km.) | | Population | | Population density (Persons/Sq. Km.) | Household Size |
|-------------|----------------|----------|------------|----------|--|-------------------|
| | Number | Per Cent | Number | Per Cent | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Pakistan | 796,095 | 100.00 | 84,253,644 | 100.00 | 105.8 | 6.7 |
| NWFP | 74,521 | 9.36 | 11,061,328 | 13.13 | 148.4 | 6.8 |
| FATA | 27,220 | 3.42 | 2,198,547 | 2.61 | 80.0 | 8.3 |
| Punjab | 205,344 | 25.80 | 47,292,441 | 56.13 | 230.3 | 6.4 |
| Sind | 140,914 | 17.70 | 19,028,666 | 22.58 | 135.0 | 7.0 |
| Baluchistan | 347,190 | 43.16 | 4,332,376 | 5.14 | 12.5 | 7.3 |
| Islamabad | 906 | 0.11 | 340,286 | 0.40 | 375.6 | 5.7 |

Source: Table 2.2, 1981 Census Report of Pakistan.

TABLE A 2.2: AGE SPECIFIC AND TOTAL MARITAL FERTILITY
RATES FROM VARIOUS SOURCES 1975 - 1984

| Age groups | PFS 1/ (1975) | PLM 2/ (1979) | PGS 3/ (1976-79) | PCPS 4/ (1984) |
|------------|------------------|------------------|---------------------|-------------------|
| 15-19 | .303 | .297 | .202 | .272 |
| 20-24 | .351 | .357 | .349 | .334 |
| 25-29 | .354 | .330 | .366 | .289 |
| 30-34 | .283 | .276 | .311 | .261 |
| 35-39 | .207 | .192 | .238 | .232 |
| 40-44 | .089 | .107 | .144 | .141 |
| 45-49 | .016 | .051 | .060 | .089 |
| TMFR | 8.02 | 8.05 | 8.35 | 8.09 |

Sources:

- 1/ Pakistan Fertility Survey (PFS), 1975.
- 2/ Population Labor Force and Migration Survey (PLM), 1979.
- 3/ Population Growth Survey (PGS), 1968-71 and 1976-79.
- 4/ Pakistan Contraceptive Prevalence Survey (PCPS), 1986.

TABLE A 2.3: URBAN-RURAL DIFFERENTIALS IN FERTILITY IN THE
PFS, PLM AND PCPS

| | Total Fertility Rate | | |
|---------------------------|----------------------|-------------|-------|
| | Major Urban | Other Urban | Rural |
| PFS (1975) | 6.2 ^{1/} | | 6.4 |
| PLM (1979) | 6.2 ^{1/} | | 6.6 |
| PCPS (1984) ^{2/} | 5.5 | 6.1 | 6.2 |

^{1/} Includes both major urban and urban areas.

^{2/} Based on births in the last 12 months.

Sources: Pakistan Contraceptive Prevalance Survey (PCPS), 1986.
Alam, I (1984). "Fertility Levels and Trends" in Alam. I.
and Deneson, B. eds. Fertility in Pakistan: A Review of Findings
from the Pakistan Fertility Sruvey. Voorburg, Netherlands:
International Statistical Institute. Sathar, Z. (1979), op. cit.

TABLE A 2.4: MEAN DESIRED NUMBER OF CHILDREN OF CURRENTLY MARRIED WOMEN BY BACKGROUND CHARACTERISTICS, URBAN-RURAL AND PROVINCE OF RESIDENCE, PCPS 1984-1985

| Background Characteristics | Pakistan | Major Urban | Other Urban | Rural | Punjab | Sind | NWFP | Baluchistan |
|------------------------------------|----------|-------------|-------------|-------|--------|------|------|-------------|
| AGE | | | | | | | | |
| All | 4.9 | 4.8 | 5.0 | 5.0 | 4.7 | 5.1 | 5.5 | 5.8 |
| 15-24 | 4.3 | 4.1 | 4.3 | 4.4 | 4.0 | 4.9 | 4.7 | 4.8 |
| 25-34 | 4.8 | 4.6 | 4.7 | 4.9 | 4.5 | 4.9 | 5.6 | 5.8 |
| 35-39 | 5.5 | 5.2 | 5.5 | 5.6 | 5.3 | 5.3 | 6.2 | 6.6 |
| 40-49 | 5.5 | 5.6 | 5.9 | 5.5 | 5.4 | 5.5 | 6.1 | 6.4 |
| EDUCATION | | | | | | | | |
| All | 4.9 | 4.8 | 5.0 | 5.0 | 4.7 | 5.1 | 5.5 | 5.8 |
| No Schooling | 5.1 | 5.3 | 5.2 | 5.0 | 4.8 | 5.2 | 5.6 | 5.9 |
| Less than Seocndary | 4.4 | 4.4 | 4.6 | 4.3 | 4.3 | 4.6 | 4.7 | 4.4 |
| Secondary | 3.9 | 3.8 | 3.9 | 4.0 | 3.9 | 3.9 | 4.1 | 3.8 |
| Collge | 3.7 | 3.8 | 3.6 | 2.9 | 3.6 | 3.7 | 5.5 | 3.3 |
| LITERACY | | | | | | | | |
| All | 4.9 | 4.8 | 5.0 | 5.0 | 4.7 | 5.1 | 5.5 | 5.8 |
| Literate | 4.2 | 4.1 | 4.3 | 4.2 | 4.1 | 4.4 | 4.7 | 3.8 |
| Illiterate | 5.1 | 5.3 | 5.1 | 5.0 | 4.8 | 5.2 | 5.6 | 5.9 |
| HUSBAND'S ECONOMIC ACTIVITY | | | | | | | | |
| All | 4.9 | 4.8 | 5.0 | 5.0 | 4.7 | 5.1 | 5.5 | 5.8 |
| Agriculture | 5.1 | 4.3 | 5.0 | 5.1 | 4.8 | 5.1 | 5.9 | 5.9 |
| Salaried | 4.8 | 4.8 | 4.9 | 4.8 | 4.5 | 4.9 | 5.2 | 6.0 |
| Self Employed | 4.9 | 4.9 | 5.0 | 4.8 | 4.7 | 5.3 | 5.4 | 5.6 |
| Unemployed | 4.9 | 5.3 | 4.7 | 4.8 | 4.7 | 5.2 | 5.3 | 5.8 |
| HUSBAND'S LITERACY | | | | | | | | |
| All | 4.9 | 4.8 | 5.0 | 5.0 | 4.7 | 5.1 | 5.5 | 5.8 |
| Literate | 4.7 | 4.6 | 4.8 | 4.8 | 4.5 | 4.9 | 5.2 | 5.7 |
| Illiterate | 5.1 | 5.3 | 5.3 | 5.1 | 4.8 | 5.2 | 5.7 | 5.9 |
| NO. OF LIVING CHILDREN | | | | | | | | |
| All | 4.9 | 4.8 | 5.0 | 5.0 | 4.7 | 5.1 | 5.5 | 5.8 |
| 0-3 | 4.2 | 3.8 | 4.0 | 4.2 | 3.8 | 4.5 | 4.7 | 5.1 |
| 4 and above | 5.9 | 5.8 | 6.0 | 5.8 | 5.7 | 5.7 | 6.5 | 6.6 |

Source: Pakistan Contraceptive Prevalance Survey (PCPS) (1986) Table VI.3

TABLE A 2.5: SOME DEMOGRAPHIC AND SOCIO-ECONOMIC CORRELATES OF INFANT MORTALITY

| | PFS | | | PLM | | |
|--|----------|---------------|-----------|----------|---------------|-----------|
| | Neonatal | Post-neonatal | 1-5 years | Neonatal | Post-neonatal | 1-5 years |
| <u>Mother's Age at birth</u> | | | | | | |
| <20 | 123 | 71 | 58 | 109 | 52 | 47 |
| 20-24 | 81 | 56 | 65 | 71 | 43 | 41 |
| 25-34 | 67 | 56 | 58 | 66 | 41 | 48 |
| 35+ | 60 | 54 | 63 | 80 | 45 | 52 |
| <u>Birth Order</u> | | | | | | |
| 1 | 110 | 65 | 49 | 96 | 46 | 35 |
| 2 | 86 | 60 | 59 | 70 | 39 | 46 |
| 3 | 70 | 53 | 55 | 63 | 39 | 42 |
| 4 | 74 | 54 | 56 | 61 | 38 | 47 |
| 5 | 67 | 62 | 73 | 61 | 43 | 51 |
| 6 | 76 | 60 | 76 | 74 | 44 | 48 |
| 7+ | 71 | 59 | 67 | 83 | 53 | 54 |
| <u>Gender of Child</u> | | | | | | |
| Boys | 89 | 52 | 63 | 79 | 41 | 44 |
| Girls | 71 | 66 | 89 | 70 | 47 | 48 |
| <u>Length of Preceding Interval</u> | | | | | | |
| <u>a. previous child survived 2 years</u> | | | | | | |
| <2 | 76 | 70 | 78 | 73 | 51 | 35 |
| 2-3 | 54 | 48 | 106 | 63 | 29 | 31 |
| 3-4 | 44 | 34 | 73 | 29 | 18 | 42 |
| 4+ | 44 | 26 | 43 | 48 | 16 | 39 |
| <u>b. previous child survived less than 2 years</u> | | | | | | |
| <2 | 167 | 98 | 98 | 225 | 82 | 40 |
| 2-3 | 91 | 84 | 81 | 136 | 71 | 51 |
| 3-4 | 64 | 48 | 94 | 183 | 71 | 19 |
| 4+ | 72 | 31 | 19 | 127 | 18 | 15 |
| <u>Urban-rural residence</u> | | | | | | |
| Urban | | | | 59 | 43 | 41 |
| Rural | | | | 81 | 44 | 48 |
| <u>Province</u> | | | | | | |
| Punjab | | | | 82 | 45 | 47 |
| Sind | | | | 63 | 38 | 40 |
| NWFP | | | | 71 | 45 | 44 |
| Baluchistan | | | | 31 | 53 | 67 |
| <u>Education of mother</u> | | | | | | |
| None | | | | 77 | 45 | 49 |
| Some | | | | 54 | 35 | 21 |
| <u>Urban-rural residence combines with education of mother</u> | | | | | | |
| Rural-none | | | | 81 | 44 | 49 |
| Rural-some | | | | 67 | 41 | 36 |
| Urban-none | | | | 62 | 46 | 48 |
| Urban-some | | | | 48 | 33 | 15 |

Source: Sathar, Z. (1985). "Infants and Child Mortality in Pakistan: Some Trends and Differentials," Journal of Biosocial Sciences, Cambridge Vol. 18, No. 3.

Annex 3: Estimation of Savings Effect

1. To estimate the effect of children on savings for urban and rural households, a two-step procedure was used. First, household income functions were estimated, using age and education of the household head, and age/sex structure of the household as explanatory variables. This would capture the effect of children on household income. Tables 6 and 8 give the results. Second, household savings functions were estimated, using as income the predicted values from the income equations plus an additional "residual" income term (the difference between predicted and actual income) as a proxy for transitory income. Age of the household head and the age/sex structure of the household were used to capture the life-cycle effects of the household, with particular emphasis on children.

2. Therefore, the direct negative effect of children on savings is captured by the coefficients in the savings regression. The positive effect of children on family income (the indirect effect) is captured by the coefficients for children of various ages and sexes in the household income regression. The savings out of that additional income can be estimated by multiplying these coefficients by the coefficient on income (the marginal propensity to save) in the savings equations. This added savings is combined with the negative direct effects of children on savings to get the "total effect" of children on savings.

3. Tables 4 and 5 summarize the direct and total savings effects in urban and rural households, by major source of income of the household.

Annex 3 Table 1. Logit Equations for Participation in School by Females 5-20 in Urban, Low-Income Neighborhoods in Pakistan

| Log-Likelihood | -820.36 | |
|------------------------------|------------------------|---------|
| Restricted (Slopes=0) Log-L | -1055.5 | |
| Chi-Squared (17) | 470.27 | |
| Significance Level | .32173E-13 | |
| Variable | Coefficient | T-ratio |
| Intercept | -2.99 | -4.82 |
| Age of Child | 0.63* | 5.82 |
| Age Squared | -0.35* | -7.80 |
| Household Expenditure | 4.0×10^{-4} * | 4.69 |
| Household Enterprise | -0.29 | 1.90 |
| Children, 0-4 yrs | -0.11* | 2.45 |
| Males, 15-60 yrs | 0.04 | -0.86 |
| Males, 60+ yrs | -0.15 | -1.07 |
| Males, 10-14 yrs | 0.09 | 1.18 |
| Females, 10-14 yrs | 0.08 | 1.00 |
| Children, 5-9 yrs | -0.11 | -1.91 |
| Females, 15-60 yrs | 0.14* | 2.55 |
| Females, 60+ yrs | 0.03 | 0.15 |
| Pathans | -0.30 | -1.81 |
| No education/literate (Head) | -0.32 | -1.43 |
| Primary School (Head) | 0.41* | 2.43 |
| Secondary School (Head) | 1.21* | 7.92 |
| Higher Education (Head) | 2.02* | 6.07 |

* Statistically significant at 5% or better.

Source: IFPRI/PIDE sample of 1000 urban, low income households.

**Annex 3 Table 2. Logit Equations for Participation in School
Males 5-20 in Urban, Low-Income Neighborhoods in Pakistan**

| Log-Likelihood | -899.97 | |
|------------------------------|------------------------|---------|
| Restricted (Slopes=0) Log-L | -1129.9 | |
| Chi-Squared (17) | 459.9 | |
| Significance Level | .32173E-13 | |
| Variable | Coefficient | T-ratio |
| Intercept | -1.73* | 3.18 |
| Age of Child | 0.53* | 5.86 |
| Age Squared | -0.29* | 8.04 |
| Household Expenditure | 3.8×10^{-4} * | 4.06 |
| Household Enterprise | -0.65* | -4.70 |
| Children, 0-4 yrs | -0.07 | -1.63 |
| Males, 15-60 yrs | -0.02 | 0.34 |
| Males, 60+ yrs | 0.04 | 0.27 |
| Males, 10-14 yrs | -0.13 | -0.18 |
| Females, 10-14 yrs | 0.71 | 0.94 |
| Children, 5-9 yrs | -0.08 | -1.26 |
| Females, 15-60 yrs | 0.01 | 0.13 |
| Females, 60+ yrs | 0.03 | 0.15 |
| Pathans | 0.37* | 2.26 |
| No education/literate (Head) | -0.08 | -0.41 |
| Primary School (Head) | 0.27 | 1.61 |
| Secondary School (Head) | 1.12* | 7.33 |
| Higher Education (Head) | 1.63* | 5.19 |

* Statistically significant at 5% or better.

Source: IFPRI/PIDE sample of 1000 urban, low income households.

Annex 3 Table 3. Determinants of Hours Worked by Adult Men in Urban Pakistan
(No income control)

| <u>Variable</u> | <u>Coefficient</u> ^{1/} | |
|-------------------|----------------------------------|------------|
| Intercept | -4.8828 | (-4.070)** |
| For wage sector: | | |
| Predicted wage | 9.7745 | (20.165)** |
| Children under 7 | 1.1608 | (2.093)* |
| Males 7-14 | 1.1439 | (1.280) |
| Females 7-14 | 1.7303 | (1.903)* |
| Males 15+ | 2.0078 | (4.011)** |
| Females 15+ | 1.1488 | (1.667)+ |
| For self-employed | | |
| Predicted wage | 5.6920 | (15.269)** |
| Children under 6 | 0.43301 | (0.683) |
| Males 7-14 | 3.8560 | (4.416)** |
| Females 7-14 | 5.1373 | (5.797)** |
| Males 15+ | 4.1586 | (6.709)** |
| Females 15+ | 3.0177 | (4.120)** |

Note: 1/ t statistic in parenthesis.
+ Statistically significant at 10%.
* Statistically significant at 5%.
** Statistically significant at 1%.

Source: IFPRI/PIDE urban survey. Tobit regression. Other regressions holding the income of other members constant do not change the results markedly.

Annex 3: Table 4. Change in Monthly Savings (Rs per month) in Urban Pakistan Associated with Additional Household Members

| | <u>Major Source of Income of Household Head</u> | | | | | |
|--|---|-------------------------|--------------------------|-------------------------|--------------------------|-------------------------|
| | <u>Wage dependent</u> | | <u>Self-employed</u> | | <u>Total</u> | |
| Average Savings (Rs/mo.) | 43.6 | | 74.7 | | 59.7 | |
| <u>Effect of one Additional person</u> | <u>Direct Effect</u> | <u>Total Effect</u> | <u>Direct Effect</u> | <u>Total Effect</u> | <u>Direct Effect</u> | <u>Total Effect</u> |
| Children under 6 | -5.8* | -1.6* | -2.8 | 1.0* | -3.7* | -0.2* |
| Males, 6-9 yrs | -9.7* | -7.4 | -1.2 | 2.4 | -5.7 | -2.9 |
| Males, 10-14 yrs | -14.4* | -6.7* | -6.0 | -1.0* | -7.9* | -1.9* |
| Males, 15+ yrs | 9.5* | 23.9* | 10.3* | 23.0* | 13.2* | 25.8* |
| Females, 6-9 yrs | -17.6* | -16.6 | -0.3 | 2.2 | -8.3* | -6.4 |
| Females, 10-14 yrs | 14.9* | -7.9* | -5.8 | -0.6* | -8.7* | -3.6* |
| Females, 15+ yrs | -0.4 | 11.8* | 4.7 | 13.7* | 4.7 | 13.9* |

Source: Derived from Appendix Tables 5c and 5d by using marginal propensity to save out of predicted income from members of household (at sample means).

* Statistically significant at 5% in savings equation for direct effect and earnings equation for indirect effect.

Annex 3: Table 5. Changes in Monthly Savings (Rs per month) in Rural Pakistan Associated with Additional Household Members

| | Major Source of Income of Household Head | | | | | | | |
|---------------------------------|--|--------------|---------------|--------------|---------------|--------------|---------------|--------------|
| | Wage Dependent | | Farm | | Other | | Total | |
| Average Savings (Rs/mo.) | 6.1 | | 27.3 | | 23.6 | | 22.0 | |
| Effect of one Additional person | Direct Effect | Total Effect | Direct Effect | Total Effect | Direct Effect | Total Effect | Direct Effect | Total Effect |
| Children under 6 yrs | -9.2* | -8.7* | -7.9* | -1.0* | -12.0* | -7.2* | -9.3* | -5.2* |
| Males, 6-9 yrs | -2.2 | -1.9 | -16.2* | -11.7 | -14.0* | -5.9* | -11.5* | -6.9* |
| Males, 10-14 yrs | -8.5 | -7.5* | -24.6* | -10.9* | -20.9* | -10.0* | -19.1* | -9.3* |
| Males, 15+ yrs | 19.8* | 21.6* | -9.0* | 6.9* | -1.4 | 21.9* | 0.0 | 16.3* |
| Females, 6-9 yrs | -7.4 | -6.9 | -18.8* | -13.9 | -7.3* | -6.9* | -10.7* | -6.0* |
| Females, 10-14 yrs | -10.4* | -10.1* | -23.7* | -12.4* | -25.7* | -15.7* | -21.0* | -5.5* |
| Females, 15+ yrs | -13.0* | -12.1* | -16.4* | -0.4* | -16.6* | 0.7* | -13.9* | -1.7* |

Source: Derived from Appendix Table 4e and 4f by using marginal propensity to save out of predicted income and added income from members of household (at sample means).

* Statistically significant at 5% in savings equation for direct effect and income equation for indirect effect.

Annex 3: Table 6. Demographically Based Household Income Functions 1/ for Urban Households
(Rupees per Month)

| | Wage Dependent Households | | Other Households | | Total | |
|------------------------------------|---------------------------|-----------|------------------|-----------|-------------|-----------|
| | Coefficient | t | Coefficient | t | Coefficient | t |
| Model Intercept | 24.73 | (0.32) | 101.93 | (0.95) | 85.90 | (1.27) |
| Age of Household Head ₁ | 4.61 | (1.33) | 7.05 | (1.52) | 4.86 | (1.64) |
| Age of Household Head ₂ | -0.01 | (0.39) | -0.05 | (1.11) | -0.02 | (0.71) |
| Education of Head | | | | | | |
| Primary Schooling | 122.10 | (5.25)** | 153.15 | (5.21)** | 140.75 | (7.27)** |
| Middle School | 170.72 | (6.54)** | 226.20 | (6.24)** | 192.61 | (8.43)** |
| Secondary School | 261.69 | (11.01)** | 418.87 | (10.65)** | 299.62 | (13.36)** |
| University | 683.44 | (25.52)** | 792.19 | (14.02)** | 672.75 | (24.51)** |
| Demographic Variables | | | | | | |
| No. children, 0-5 | 35.80 | (4.99)** | 56.34 | (5.60)** | 48.57 | (7.70)** |
| Males, 6-9 yrs | 19.37 | (1.51) | 52.02 | (2.94)** | 37.82 | (3.38)** |
| Males, 10-14 yrs | 67.31 | (5.21)** | 81.96 | (4.91)** | 81.95 | (7.55)** |
| Adult males, 15+ yrs | 125.47 | (11.83)** | 186.17 | (14.84)** | 173.88 | (20.65)** |
| Females, 6-9 yrs | 9.24 | (0.67) | 37.01 | (2.05)** | 27.01 | (2.31)** |
| Females, 10-14 yrs | 60.81 | (4.63)** | 75.51 | (4.43)** | 70.62 | (6.37)** |
| Adult females, 15+ yrs | 106.55 | (11.93)** | 131.08 | (10.68)** | 127.27 | (16.42)** |
| Number of Earners | 118.28 | (9.10)** | -18.55 | (1.12) | 20.08 | (1.89)+ |
| F-value | 162.29 | | 91.91 | | 215.67 | |
| R ² | .40 | | .26 | | .30 | |
| No. of observations | 3353 | | 3588 | | 6942 | |

Note: 1/ Dependent variable is household income in Rs/month.
 + Statistically significant at 10%.
 * Statistically significant at 5%.
 ** Statistically significant at 1%.

Source: 1979 Pakistan Household Income and Expenditure Survey.

Annex 3: Table 7. Demographic Household Savings Functions 1/ for Urban Households
(Rupees per Month)

| | <u>Wage Dependent Households</u> | | <u>Other Households</u> | | <u>Total</u> | |
|------------------------------------|----------------------------------|-----------|-------------------------|-----------|--------------------|-----------|
| | <u>Coefficient</u> | <u>t</u> | <u>Coefficient</u> | <u>t</u> | <u>Coefficient</u> | <u>t</u> |
| Model Intercept | -80.18 | (2.62)** | -35.24 | (0.96) | -44.58 | (1.87)* |
| Predicted Income (Rs/month) | 0.11 | (7.68)** | 0.07 | (3.45)** | 0.07 | (5.38)** |
| Residual Income (Rs/month) | 0.16 | (18.82)** | 0.19 | (23.34)** | 0.17 | (29.88)** |
| Residual Income squared | 0.00 | (31.08)** | 0.00 | (34.30)** | 0.00 | (47.34)** |
| Age of Household Head ² | -0.03 | (0.02) | -1.37 | (0.88) | -1.05 | (1.01) |
| Age of Household Head ² | -0.00 | (0.20) | 0.02 | (0.99) | 0.01 | (0.99) |
| Demographic Variables | | | | | | |
| No. children, 0-5 yrs | -5.75 | (2.00)** | -2.82 | (0.79) | -3.70 | (1.62) |
| Males, 6-9 yrs | -9.65 | (1.91)+ | -1.17 | (0.19) | -5.68 | (1.44) |
| Males, 10-14 yrs | 14.44 | (2.77)** | -6.60 | (1.12) | -7.89 | (1.98)* |
| Adult males, 15+ yrs | 9.51 | (2.20)* | 10.28 | (2.00)* | 13.22 | (3.77)** |
| Females, 6-9 yrs | -17.65 | (3.24)** | -0.33 | (0.05) | -8.35 | (2.03)* |
| Females, 10-14 yrs | -14.92 | (2.85)** | -5.77 | (0.96) | -8.72 | (2.17)* |
| Adult females, 15+ yrs | -0.46 | (0.11) | 4.70 | (0.95) | 4.68 | (1.42) |
| F-value | 291.04 | | 397.06 | | 714.78 | |
| R ² | .51 | | .57 | | .55 | |
| No. of observations | 3353 | | 3586 | | 6940 | |

Note: 1/ Dependent variable is household savings in Rs/month.
+ Statistically significant at 10%.
* Statistically significant at 5%.
** Statistically significant at 1%.

Source: 1979 Pakistan Household Income and Expenditure Survey.

Annex 3: Table 8. Demographically Based Household Income Functions ^{1/} for Rural Households
(Rupees per month)

| | <u>Wage Dependent Households</u> | | <u>Farm Households</u> | | <u>Other Households</u> | | <u>Total Rural</u> | |
|---|----------------------------------|-----------|------------------------|-----------|-------------------------|-----------|--------------------|-----------|
| | <u>Coefficient</u> | <u>t</u> | <u>Coefficient</u> | <u>t</u> | <u>Coefficient</u> | <u>t</u> | <u>Coefficient</u> | <u>t</u> |
| Model Intercept | 95.94 | (2.01)* | 193.45 | (3.42)** | 155.59 | (3.43)** | 142.76 | (4.67)** |
| Age of Household Head | 3.50 | (1.61) | 6.20 | (2.66)** | 2.94 | (1.50) | 4.54 | (3.43)** |
| Age of Head ^c | -0.04 | (1.58) | -0.05 | (2.25)** | -0.03 | (1.61) | -0.04 | (3.17)** |
| Education of Head (Relative to no education) | | | | | | | | |
| Primary School | 42.34 | (2.55)** | 141.08 | (7.44)** | 111.81 | (7.55)** | 110.33 | (10.66)** |
| Middle School | 121.49 | (5.61)** | 168.20 | (5.48)** | 134.27 | (5.75)** | 132.32 | (8.35)** |
| Secondary School | 230.00 | (10.40)** | 281.78 | (6.18)** | 316.61 | (10.35)** | 253.30 | (12.72)** |
| University | 322.97 | (10.65)** | 108.02 | (1.06) | 389.61 | (5.68)** | 256.98 | (7.28)** |
| Demographic Variables | | | | | | | | |
| Children, 0-5 yrs | 32.11 | (6.28)** | 42.21 | (7.39)** | 28.79 | (5.78)** | 33.93 | (10.33)** |
| Males, 6-9 yrs | 17.70 | (1.93)+ | 26.84 | (2.88)** | 49.95 | (5.79)** | 36.46 | (6.57)** |
| Males, 10-14 yrs | 62.92 | (6.54)** | 83.10 | (8.52)** | 67.14 | (7.49)** | 77.68 | (13.37)** |
| Adult Males, 15+ yrs | 123.34 | (13.18)** | 96.48 | (4.20)** | 142.56 | (21.35)** | 126.80 | (30.07)** |
| Females, 6-9 yrs | 28.45 | (3.05)** | 29.73 | (3.01)** | 51.98 | (5.77)** | 39.79 | (6.82)** |
| Females, 10-14 yrs | 50.45 | (4.88)** | 68.50 | (6.74)** | 61.47 | (6.79)** | 64.76 | (10.75)** |
| Adult Females, 15+ yrs | 60.07 | (13.18)** | 96.67 | (12.93)** | 111.51 | (16.75)** | 100.01 | (22.68)** |
| Number of Earners | 54.48 | (5.09)** | -26.55 | (1.53) | -3.31 | (0.400) | -3.38 | (0.57) |
| F-Value | 105.35 | | 88.52 | | 176.05 | | 320.28 | |
| R ² | .42 | | .20 | | .35 | | .28 | |
| No. of observations | 2084 | | 4873 | | 4544 | | 11503 | |

Note: ^{1/} Dependent variable is household savings in Rs/month
 + Statistically significant at 10%.
 * Statistically significant at 5%.
 ** Statistically significant at 1%.

Source: 1979 Pakistan Household Income and Expenditure Survey.

Annex 3: Table 9. Demographic Household Savings Functions 1/ for Rural Households
(Rupees per Month)

| | <u>Wage Dependent Households</u> | | <u>Farm Households</u> | | <u>Other Households</u> | | <u>Total Rural</u> | |
|------------------------------|----------------------------------|-----------|------------------------|-----------|-------------------------|-----------|--------------------|-----------|
| | <u>Coefficient</u> | <u>t</u> | <u>Coefficient</u> | <u>t</u> | <u>Coefficient</u> | <u>t</u> | <u>Coefficient</u> | <u>t</u> |
| Model Intercept | -39.78 | (1.49) | -48.78 | (1.81)+ | -38.93 | (1.76)+ | -40.09 | (2.65)** |
| Predicted Income (Rs/month) | 0.01 | (0.41) | 0.17 | (3.85)** | 0.16 | (4.97)** | 0.12 | (4.82)** |
| Residual Income (Rs/month) | 0.12 | (8.07)** | 0.37 | (45.28)** | 0.26 | (33.14)** | 0.30 | (58.23)** |
| Residual Income Squared | 0.00 | (11.28)** | 0.00 | (33.93)** | 0.00 | (33.24)** | 0.00 | (53.55)** |
| Age of Household Head | 1.19 | (1.01) | 0.62 | (0.57) | -0.61 | (0.67) | 0.36 | (0.58) |
| Age of Head ² | -0.01 | (0.80) | -0.01 | (0.58) | 0.01 | (0.95) | -0.00 | (0.33) |
| Demographic Variables | | | | | | | | |
| No. children, 0-5 yrs | -9.19 | (3.02)** | -7.94 | (2.46)** | -11.99 | (4.74)** | -9.32 | (5.20)** |
| Males, 6-9 yrs | -2.20 | (0.45) | -16.16 | (3.67)** | -14.01 | (3.27)** | -11.47 | (4.21)** |
| Males, 10-14 yrs | -8.45 | (1.44) | -24.62 | (4.26)** | -20.89 | (4.45)** | -19.14 | (5.68)** |
| Males, 15+ yrs | 19.76 | (2.94)** | -9.03 | (1.74)+ | -1.40 | (0.26) | 0.85 | (0.23) |
| Females, 6-9 yrs | -7.38 | (1.43) | -18.76 | (3.99)** | -7.31 | (1.63) | -10.71 | (3.70)** |
| Females, 10-14 yrs | -10.84 | (1.81) | -23.74 | (4.29)** | -25.70 | (5.49)** | -21.04 | (6.41)** |
| Adult Females, 15+ yrs | -12.97 | (2.76)** | -16.35 | (2.99)** | -17.59 | (3.59)** | -13.86 | (4.18)** |
| F-value | 42.87 | | 669.25 | | 379.41 | | 1164.21 | |
| R ² | .20 | | .62 | | .50 | | .55 | |
| No. of observations | 2084 | | 4873 | | 4544 | | 11503 | |

Note: 1/ Dependent variable is household savings in Rs/month

+ Statistically significant at 10%.

* Statistically significant at 5%.

** Statistically significant at 1%.

Source: 1979 Pakistan Household Income and Expenditure Survey.

ANNEX 4: THE ENROLLMENT FINANCE PROJECTION MODEL

1. This model projects enrollments, teacher requirements and associated recurrent and development expenditures at the primary education level for boys and girls. The information needed to run the model is as follows:

- o base year enrollments by grade and sex
- o base year dropout and repeater rates by grade and sex
- o first grade growth rates by year and sex
- o age-cohort population growth rates by year and sex
- o student-teacher ratios by year
- o annual attrition rate of the teaching force
- o annual growth in teacher training capacity
- o average monthly teacher salary
- o a factor which represents the ratio between expenditures on items other than books, materials and salaries (e.g. maintenance), and total salary expenditures
- o per student expenditures on books and materials by year
- o number of students per classroom
- o the relative numbers of classrooms to be replaced each year
- o factors for equipment and maintenance per classrooms
- o cost per classroom for boys and girls

An assumption is made that 10% of students attend private school.

2. The model uses standard methodology 1/ to project:

- o gradewise enrollments and numbers of repeaters
- o participation rates for primary age cohorts, both with and without repeaters
- o additional teacher requirements and cumulative deficits

3. The model uses Seventh Plan assumptions concerning first grade growth rates in primary and secondary schooling. Population growth rates are based on the projections presented in Chapter 2 and Annex 1.

4. The model also projects:

- o teacher and other staff costs, and costs of allowances
- o expenditures on books and materials
- o construction and equipment costs for new and replaced classrooms
- o maintenance costs
- o annual and cumulative recurrent and development expenditures

1/ A factor is included which allows for only one repetition per child in any grade.

TABLE 1: ENROLLMENT-FINANCE MODEL, ASSUMING HIGH POPULATION GROWTH, SEVENTH PLAN ENROLLMENT TARGETS.

PNM: Enrollment Projections 19 Nov 87 EMUD

This model assumes only one repetition between grade 1 and 2.

Source Data: Enrollments Planning Commission, Costs: SMR Third Primary Education project
 Actual growth data uses mid point of planning commission high and low growth projections

| Priority Level | National | | | Male | | | Female | | |
|----------------|----------|--------|---------|--------|--------|---------|--------|--------|---------|
| | Enroll | Repeat | Dropout | Enroll | Repeat | Dropout | Enroll | Repeat | Dropout |
| 1 | 71.0 | 14.6 | 13.6 | 71.0 | 14.6 | 13.6 | 71.0 | 14.6 | 13.6 |
| 2 | 81.6 | 8.5 | 9.9 | 79.4 | 11.7 | 8.9 | 79.4 | 11.7 | 8.9 |
| 3 | 83.6 | 7.7 | 8.7 | 75.0 | 11.6 | 13.4 | 75.0 | 11.6 | 13.4 |
| 4 | 88.7 | 6.9 | 6.8 | 81.5 | 10.7 | 7.8 | 81.5 | 10.7 | 7.8 |
| 5 | | 5.7 | | | 9.7 | | | 9.7 | |

| | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 |
|-------------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 2 grade 1 growth male | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 | 5.5 |
| 1 grade 1 growth female | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 |
| Age Cohort growth(male) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.4 | 3.2 | 2.9 | 2.7 | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 | 2.6 |
| Age Cohort growth(female) | 4.2 | 4.2 | 4.2 | 4.2 | 4.0 | 3.6 | 3.4 | 3.1 | 2.8 | 2.8 | 2.8 | 2.8 | 2.8 | 2.8 | 2.8 | 2.8 | 2.8 |
| Student/Teacher Ratio | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 35 |
| Teacher Attrition Rate | 0.05 | | | | | | | | | | | | | | | | |
| Growth in Teacher Training Capacity | 0.05 | | | | | | | | | | | | | | | | |

| ENR | Male | | | | | | | | | | | | | | | | |
|------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 |
| 1 | 1,154,000 | 1,231,079 | 1,317,091 | 1,397,055 | 1,486,179 | 1,580,931 | 1,681,716 | 1,788,925 | 1,902,968 | 2,024,282 | 2,153,329 | 2,290,603 | 2,436,620 | 2,591,963 | 2,757,199 | 2,932,970 | 3,119,900 |
| 2 | 1,667,000 | 1,195,000 | 905,447 | 1,026,419 | 1,090,330 | 1,159,754 | 1,233,680 | 1,312,336 | 1,395,997 | 1,484,991 | 1,579,659 | 1,680,361 | 1,787,000 | 1,901,635 | 2,022,651 | 2,151,593 | 2,288,750 |
| 3 | 883,000 | 979,000 | 1,050,503 | 1,095,014 | 1,165,764 | 1,249,400 | 1,337,237 | 1,429,747 | 1,527,400 | 1,630,724 | 1,739,244 | 1,853,507 | 1,973,143 | 2,097,700 | 2,226,827 | 2,361,177 | 2,501,400 |
| 4 | 742,000 | 813,000 | 874,541 | 930,560 | 1,004,632 | 1,087,600 | 1,179,704 | 1,281,132 | 1,392,204 | 1,513,367 | 1,645,000 | 1,787,627 | 1,941,725 | 2,107,820 | 2,286,463 | 2,477,327 | 2,681,100 |
| 5 | 629,000 | 717,000 | 767,000 | 819,152 | 879,190 | 943,823 | 1,013,352 | 1,088,171 | 1,168,635 | 1,255,102 | 1,347,956 | 1,447,617 | 1,554,510 | 1,668,185 | 1,788,180 | 1,914,947 | 2,054,000 |
| Total | 4,055,000 | 4,935,079 | 5,905,142 | 6,665,261 | 7,566,043 | 8,520,819 | 9,542,925 | 10,634,183 | 11,797,600 | 13,034,274 | 14,357,256 | 15,770,440 | 17,278,088 | 18,884,218 | 20,592,600 | 22,408,170 | 24,335,050 |
| Repeaters | 411,301 | 453,653 | 460,116 | 476,814 | 495,933 | 507,006 | 511,737 | 565,195 | 601,059 | 639,569 | 680,170 | 723,085 | 769,607 | 818,669 | 870,090 | 926,090 | 986,376 |
| Pop 5-9 | 7,253,000 | 7,506,059 | 7,769,595 | 8,041,531 | 8,322,904 | 8,605,966 | 8,891,357 | 9,180,916 | 9,474,677 | 9,772,994 | 10,075,266 | 10,381,900 | 10,692,400 | 11,007,320 | 11,326,160 | 11,649,520 | 11,977,000 |
| Participation rate | 60.61 | 66.61 | 65.71 | 64.71 | 63.61 | 62.61 | 61.61 | 60.61 | 59.61 | 58.61 | 57.61 | 56.61 | 55.61 | 54.61 | 53.61 | 52.61 | 51.61 |
| Participation Rate minus Repeaters | 62.61 | 68.61 | 67.71 | 66.71 | 65.61 | 64.61 | 63.61 | 62.61 | 61.61 | 60.61 | 59.61 | 58.61 | 57.61 | 56.61 | 55.61 | 54.61 | 53.61 |
| Population Aged 9 | 1,450,000 | 1,501,371 | 1,553,919 | 1,606,366 | 1,664,597 | 1,721,193 | 1,776,271 | 1,827,703 | 1,877,113 | 1,925,919 | 1,974,613 | 2,022,390 | 2,069,662 | 2,116,104 | 2,161,473 | 2,206,695 | 2,251,700 |
| Part. Rate of 9 Yr Olds | 66.61 | 67.91 | 69.71 | 71.61 | 73.31 | 74.91 | 76.41 | 77.81 | 79.11 | 80.31 | 81.41 | 82.41 | 83.31 | 84.11 | 84.81 | 85.41 | 85.91 |
| Teacher Requirements | 141,001 | 147,439 | 144,709 | 147,601 | 150,761 | 154,000 | 157,360 | 160,869 | 164,507 | 168,266 | 172,146 | 176,147 | 180,270 | 184,527 | 188,917 | 193,434 | 198,079 |
| Net Teacher Req. | 0,000 | 0,000 | 0,631 | 10,000 | 10,500 | 15,203 | 17,003 | 19,151 | 20,601 | 22,705 | 24,800 | 26,961 | 29,187 | 31,477 | 33,831 | 36,250 | 38,734 |

| ENR | Female | | | | | | | | | | | | | | | | |
|------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------|------------|------------|------------|------------|------------|------------|------------|
| | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 |
| 1 | 571,200 | 641,000 | 707,119 | 769,000 | 826,660 | 877,814 | 9,304,191 | 1,247,760 | 1,366,541 | 1,502,650 | 1,652,316 | 1,816,009 | 1,997,050 | 2,196,003 | 2,412,632 | 2,636,256 | 2,870,020 |
| 2 | 882,000 | 561,000 | 543,064 | 637,100 | 709,000 | 782,197 | 868,322 | 966,000 | 1,040,271 | 1,113,000 | 1,195,017 | 1,285,097 | 1,383,000 | 1,489,000 | 1,602,000 | 1,722,000 | 1,849,000 |
| 3 | 390,000 | 437,000 | 480,266 | 486,900 | 562,329 | 628,970 | 698,076 | 763,602 | 837,134 | 921,304 | 1,013,337 | 1,114,400 | 1,224,692 | 1,340,972 | 1,474,000 | 1,614,000 | 1,761,000 |
| 4 | 320,000 | 366,000 | 366,912 | 399,044 | 447,917 | 503,504 | 571,546 | 646,323 | 728,369 | 817,670 | 915,190 | 1,021,607 | 1,137,632 | 1,264,025 | 1,401,621 | 1,550,336 | 1,710,190 |
| 5 | 266,000 | 309,000 | 320,263 | 330,075 | 357,642 | 393,143 | 435,031 | 483,310 | 538,000 | 599,250 | 667,002 | 741,709 | 824,057 | 914,663 | 1,014,700 | 1,124,664 | 1,244,000 |
| Total | 2,400,200 | 2,790,000 | 2,805,602 | 2,904,044 | 2,972,732 | 3,271,675 | 3,621,115 | 3,994,066 | 4,395,755 | 4,816,547 | 5,256,201 | 5,705,030 | 6,172,690 | 6,660,339 | 7,172,335 | 7,706,911 | 8,268,216 |
| Repeaters | 223,430 | 251,112 | 271,662 | 293,930 | 325,534 | 367,000 | 417,000 | 474,000 | 538,000 | 609,000 | 687,000 | 772,000 | 864,000 | 964,000 | 1,072,000 | 1,188,000 | 1,312,000 |
| Pop 5-9 | 4,952,000 | 5,764,664 | 7,040,700 | 7,544,829 | 7,630,622 | 7,913,612 | 8,402,673 | 8,936,330 | 9,527,355 | 10,175,307 | 10,888,010 | 11,664,010 | 12,503,000 | 13,404,000 | 14,367,000 | 15,392,000 | 16,480,000 |
| Participation rate | 35.31 | 36.71 | 38.41 | 40.31 | 42.31 | 44.31 | 46.31 | 48.31 | 50.31 | 52.31 | 54.31 | 56.31 | 58.31 | 60.31 | 62.31 | 64.31 | 66.31 |
| Participation Rate minus Repeaters | 33.91 | 35.01 | 36.71 | 38.31 | 40.01 | 41.71 | 43.41 | 45.01 | 46.71 | 48.41 | 50.11 | 51.81 | 53.51 | 55.21 | 56.91 | 58.61 | 60.31 |
| Population Aged 9 | 1,700,000 | 1,752,935 | 1,809,730 | 1,870,900 | 1,937,274 | 1,998,772 | 1,636,335 | 1,647,266 | 1,734,511 | 1,783,077 | 1,835,604 | 1,892,370 | 1,953,009 | 1,991,337 | 2,047,600 | 2,104,000 | 2,161,000 |
| Part. Rate of 9 Yr Olds | 21.31 | 21.91 | 21.21 | 22.01 | 21.71 | 21.71 | 21.71 | 21.71 | 21.71 | 21.61 | 21.61 | 21.61 | 21.61 | 21.61 | 21.61 | 21.61 | 21.61 |
| Teacher Requirements | 65,554 | 71,017 | 77,250 | 84,915 | 93,476 | 103,000 | 113,660 | 124,400 | 136,200 | 149,100 | 163,100 | 178,200 | 194,500 | 212,000 | 230,000 | 248,000 | 266,000 |
| Net Teacher Req. | 0,701 | 9,792 | 11,540 | 12,700 | 14,650 | 16,650 | 18,650 | 20,650 | 22,650 | 24,650 | 26,650 | 28,650 | 30,650 | 32,650 | 34,650 | 36,650 | 38,650 |

ANNEX 4: ENROLLMENT/FINANCE PROJECTION
 MODELS DETAILED PROJECTIONS

This model assumes only one repetition between grade 1 and 2.

Source Data: Enrollments Planning Commission, Costs: SIM Third Primary Education project Annual growth data uses mid point of planning commission high and low growth projections: Low Population Projection

National Level

| | Male | | | Female | | |
|---|---------|--------|---------|---------|--------|---------|
| | Promote | Repeat | Dropout | Promote | Repeat | Dropout |
| 1 | 71.8 | 10.6 | 17.6 | 70.8 | 10.6 | 16.6 |
| 2 | 81.6 | 8.5 | 9.9 | 79.4 | 11.7 | 8.9 |
| 3 | 83.6 | 7.7 | 8.7 | 75.6 | 11.6 | 15.4 |
| 4 | 88.7 | 6.9 | 6.0 | 81.5 | 10.7 | 7.8 |
| 5 | | 5.7 | | | 9.7 | |

| M42 | Rate | | | | | | | | | | | | | | | | |
|------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 |
| 1 | 1,138,000 | 1,231,070 | 1,312,891 | 1,397,053 | 1,472,200 | 1,549,430 | 1,620,429 | 1,715,624 | 1,805,266 | 1,899,590 | 1,998,043 | 2,103,282 | 2,215,178 | 2,328,816 | 2,450,096 | 2,578,533 | 2,713,261 |
| 2 | 1,067,000 | 1,195,000 | 905,667 | 1,026,819 | 1,090,130 | 1,149,724 | 1,210,717 | 1,273,517 | 1,300,667 | 1,410,007 | 1,403,763 | 1,501,709 | 1,647,866 | 1,728,705 | 1,819,430 | 1,910,073 | 2,016,003 |
| 3 | 881,000 | 979,000 | 1,050,503 | 885,814 | 905,704 | 959,040 | 1,012,052 | 1,065,665 | 1,121,230 | 1,179,879 | 1,241,077 | 1,306,345 | 1,374,601 | 1,446,423 | 1,521,990 | 1,601,572 | 1,685,291 |
| 4 | 747,000 | 813,000 | 874,541 | 930,564 | 804,632 | 812,680 | 850,174 | 905,289 | 951,194 | 1,003,119 | 1,055,553 | 1,110,700 | 1,168,743 | 1,229,809 | 1,294,067 | 1,361,601 | 1,432,020 |
| 5 | 629,000 | 717,000 | 762,000 | 819,157 | 879,190 | 763,823 | 764,392 | 806,771 | 848,864 | 893,860 | 940,717 | 989,076 | 1,041,622 | 1,096,007 | 1,153,316 | 1,213,576 | 1,276,905 |
| Total | 4,453,000 | 4,935,070 | 4,905,382 | 5,066,201 | 5,152,072 | 5,235,113 | 5,475,265 | 5,764,667 | 6,068,621 | 6,306,694 | 6,720,354 | 7,071,521 | 7,401,910 | 7,879,001 | 8,230,906 | 8,649,306 | 9,122,130 |
| Operators | 411,361 | 451,653 | 451,653 | 460,111 | 470,814 | 482,994 | 497,434 | 521,626 | 549,100 | 577,965 | 608,710 | 639,999 | 673,400 | 700,620 | 735,653 | 764,613 | 825,609 |
| Pop 5-9 | 7,253,060 | 7,506,035 | 7,269,595 | 8,041,531 | 8,322,904 | 8,610,209 | 8,872,717 | 9,094,535 | 9,276,426 | 9,419,532 | 9,509,720 | 9,664,825 | 9,769,076 | 9,797,882 | 9,975,061 | 9,994,826 | |
| Participation rate | 60.81 | 66.82 | 66.82 | 65.21 | 65.21 | 62.91 | 63.68 | 65.01 | 66.81 | 68.01 | 71.01 | 74.01 | 77.58 | 80.72 | 84.12 | 87.62 | 91.31 |
| Participation Rate minus Operators | 62.42 | 68.01 | 68.01 | 69.31 | 69.21 | 67.11 | 67.88 | 69.12 | 70.71 | 72.62 | 74.91 | 77.61 | 80.51 | 83.61 | 86.91 | 90.31 | 93.81 |
| Population Aged 9 | 1,450,000 | 1,501,371 | 1,553,917 | 1,608,306 | 1,664,597 | 1,722,830 | 1,774,543 | 1,810,907 | 1,855,205 | 1,883,116 | 1,901,946 | 1,920,963 | 1,940,175 | 1,959,576 | 1,979,172 | 1,998,964 | |
| Part. Rate of 9 to 8ids | 66.61 | 67.91 | 67.91 | 65.62 | 65.62 | 63.12 | 64.88 | 66.01 | 67.01 | 68.01 | 69.01 | 70.01 | 71.01 | 72.01 | 73.01 | 74.01 | 75.01 |
| Teacher Requirements | 161,001 | 162,439 | 164,769 | 167,702 | 169,575 | 176,436 | 184,705 | 173,309 | 182,471 | 192,010 | 202,043 | 212,600 | 223,709 | 235,397 | 247,691 | 260,639 | |
| W/L Teacher Req. | | 0.009 | 9.651 | 9.691 | 9.731 | 10.340 | 10.090 | 10.720 | 11.752 | 10.662 | 10.634 | 20.639 | 21.730 | 22.874 | 24.069 | 25.327 | |

| M42 | Female | | | | | | | | | | | | | | | | |
|------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 |
| 1 | 571,200 | 641,000 | 762,625 | 830,772 | 916,462 | 1,000,763 | 1,092,763 | 1,193,214 | 1,302,899 | 1,422,666 | 1,555,042 | 1,696,200 | 1,852,165 | 2,022,423 | 2,208,331 | 2,411,329 | 2,632,907 |
| 2 | 489,000 | 541,000 | 543,000 | 631,982 | 701,570 | 747,390 | 830,300 | 915,877 | 999,435 | 1,091,525 | 1,191,862 | 1,301,423 | 1,421,090 | 1,551,683 | 1,690,319 | 1,850,063 | 2,020,132 |
| 3 | 390,000 | 437,000 | 480,706 | 486,902 | 559,862 | 621,997 | 681,675 | 744,742 | 813,279 | 880,050 | 969,685 | 1,058,822 | 1,156,353 | 1,264,431 | 1,370,670 | 1,509,193 | 1,643,535 |
| 4 | 320,000 | 366,000 | 366,912 | 399,444 | 407,917 | 463,544 | 516,897 | 566,941 | 619,166 | 676,210 | 730,392 | 806,272 | 880,380 | 961,346 | 1,059,684 | 1,166,175 | 1,251,535 |
| 5 | 266,000 | 309,000 | 320,263 | 330,875 | 352,642 | 367,143 | 413,001 | 466,719 | 506,339 | 555,235 | 604,823 | 660,450 | 721,176 | 789,070 | 859,857 | 930,099 | 1,025,206 |
| Total | 2,000,200 | 2,294,000 | 2,401,110 | 2,609,970 | 2,943,660 | 3,221,665 | 3,542,765 | 3,880,593 | 4,241,317 | 4,672,187 | 5,050,206 | 5,523,715 | 6,030,936 | 6,505,323 | 7,100,669 | 7,851,662 | 8,573,615 |
| Operators | 223,030 | 251,112 | 271,106 | 294,002 | 322,542 | 353,254 | 388,316 | 425,200 | 464,770 | 507,592 | 554,272 | 605,227 | 660,862 | 721,611 | 789,964 | 860,175 | |
| Pop 5-9 | 6,072,000 | 6,264,664 | 7,040,700 | 7,340,829 | 7,630,622 | 7,913,612 | 8,182,675 | 8,446,330 | 8,672,555 | 8,872,024 | 9,031,721 | 9,150,165 | 9,277,221 | 9,300,507 | 9,401,821 | 9,506,700 | |
| Participation rate | 35.38 | 36.71 | 38.21 | 40.11 | 42.21 | 44.01 | 47.41 | 50.31 | 53.41 | 57.62 | 61.71 | 65.91 | 71.01 | 76.41 | 82.71 | 89.01 | 95.31 |
| Participation Rate minus Operators | 31.98 | 33.01 | 34.31 | 36.11 | 37.91 | 40.71 | 42.71 | 45.21 | 48.11 | 51.31 | 55.01 | 59.21 | 63.91 | 69.01 | 74.61 | 80.31 | 86.01 |
| Population Aged 9 | 1,290,000 | 1,352,933 | 1,409,736 | 1,468,966 | 1,527,724 | 1,587,232 | 1,646,535 | 1,697,760 | 1,740,511 | 1,776,065 | 1,804,340 | 1,826,633 | 1,850,940 | 1,877,709 | 1,900,360 | 1,917,340 | |
| Part. Rate of 9 to 8ids | 21.34 | 21.91 | 21.21 | 22.41 | 22.41 | 21.21 | 25.41 | 26.41 | 27.01 | 28.01 | 29.01 | 30.01 | 30.61 | 30.31 | 30.41 | 30.71 | 30.31 |
| Teacher Requirements | 65,534 | 70,899 | 76,836 | 84,099 | 91,036 | 101,700 | 110,074 | 117,000 | 127,400 | 140,520 | 157,000 | 172,312 | 188,152 | 205,000 | 224,533 | 244,955 | |
| W/L Teacher Req | | 0.012 | 9.512 | 11.085 | 12.116 | 13.779 | 16.777 | 18.150 | 17.777 | 17.777 | 20.517 | 22.197 | 24,055 | 26,763 | 29,130 | 31,830 | |

TABLE A5.1: ENROLLMENT RATIOS BY LEVEL OF SCHOOLING, BY SEX,

1981-1985

| | <u>Primary (5-9 yrs) 1/</u> | | | <u>Middle (10-12 yrs)</u> | | | <u>High (13-14 yrs)</u> | | | <u>College and above (15-24 yrs)</u> | | |
|---------------|-----------------------------|------|------|---------------------------|------|------|-------------------------|-----|------|--------------------------------------|------|------|
| | M | F | I | M | F | I | M | F | I | M | F | I |
| 1951 | 32.5 | 5.0 | 20.1 | 16.7 | 2.5 | 10.1 | 7.4 | 1.3 | 4.6 | 0.9 | 0.2 | 0.6 |
| 1961 | 47.2 | 14.2 | 31.8 | 21.2 | 4.2 | 13.3 | 11.9 | 2.8 | 7.6 | 1.9 | 0.6 | 1.3 |
| 1971 | 56.4 | 22.3 | 40.2 | 30.1 | 8.5 | 20.3 | 18.0 | 5.6 | 12.4 | 3.8 | 1.4 | 2.7 |
| 1981 | 58.0 | 27.5 | 47.0 | 29.9 | 11.8 | 22.0 | 17.8 | 7.2 | 13.0 | 3.6 | 1.6 | 2.7 |
| 1983 | 68.0 | 36.0 | 53.0 | n.a. | n.a. | 25.0 | 20.0 | 8.1 | 14.0 | n.a. | n.a. | n.a. |
| 1985 | 79.0 | 42.0 | 61.0 | 34.2 | 12.5 | 27.0 | 20.0 | 8.1 | 14.0 | 4.3 | 1.8 | 3.1 |
| 1985 (net) 2/ | 68.0 | 35.3 | 52.6 | | | | | | | | | |

Source: The State of Population in Pakistan, NIPS, 1986. (1951-1981)
 Ministry of Education
 Mission Estimates

1/ Primary enrollment data include under-age and over-age children, and repeaters.

2/ Net of under-age children.

TABLE A5.2: TRENDS IN EDUCATION EXPENDITURE 1982-87

(thousands of rupees; current prices)

| Year | Total Development Expenditure | Education Development Expenditure | % Development Expenditure on Education | Consolidated Current Expenditure | Current Expenditure on Education | % Current Expenditure on Education | Total Expenditure on Education as % of Total Government Expenditure | % of GNP |
|---------|-------------------------------|-----------------------------------|--|----------------------------------|----------------------------------|------------------------------------|---|----------|
| 1983/84 | 28,782 | 1,622 | 5.8% | 75,312 | 5,781 | 7.7% | 7.2% | 1.6 |
| 1984/85 | 33,555 | 1,990 | 5.9% | 87,352 | 7,023 | 8.0% | 7.5% | 1.8 |
| 1985/86 | 37,443 | 2,431 | 6.5% | 99,340 | 8,888 | 8.9% | 8.3% | 2.0 |
| 1986/87 | 42,273 | 3,643 | 8.6% | 116,406 | 11,028 | 9.5% | 9.2% | 2.3 |
| 1987/88 | 45,315 | 3,999 | 8.8% | 129,259 | 12,725 | 9.8% | 9.6% | 2.4 |
| 1983-87 | 187,368 | 13,725 | 7.3% ^{1/} | 507,669 | 45,445 | 9.0% | 8.5% | |

Note:

1. Comparative figure for Fifth Plan period was 3.9%.
2. Projected.

Source: Federal and Provincial Planning and Education Departments; Mission estimates.

TABLE A5.3: YEAR ON YEAR CHANGES IN EDUCATION EXPENDITURES,
CONSTANT PRICES
1983/84 - 1987/88

(percentage increases)

| | Recurrent | Development | Combined |
|-------------------------|-----------|-------------|----------|
| Education | | | |
| 1983/84-1984/85 | 17.1 | 15.5 | 16.7 |
| 1984/85-1985/86 | 20.7 | 16.5 | 19.8 |
| 1985/86-1986/87 | 18.9 | 43.7 | 24.3 |
| 1986/87-1987/88 | 9.5 | 4.7 | 8.3 |
| 1983/84-1987/88 | 84.1 | 102.4 | 88.2 |
| Total Government | | | |
| 1983/84-1987/88 | 43.5 | 31.7 | 33.7 |

Note: 1982 prices

Source: Federal and Provincial Planning and Education Departments;
Education Sector Mission Estimates.

TABLE A5.4: RECURRENT EXPENDITURES ON PRIMARY, AND SECONDARY SCHOOLS, AND COLLEGES
BY MAJOR CLASSIFICATION, 1986-87
(Rs millions), Punjab and Sind Provinces.

PUNJAB

| Category | Primary | % | Secondary | % | Colleges | % |
|-------------------------|---------|--------|-----------|--------|----------|--------|
| Heads/Administrators 1/ | | 0.00 | 106.44 | 9.01 | 35.92 | 6.39 |
| Teachers | 1790.01 | 78.45 | 684.58 | 57.96 | 313.47 | 55.75 |
| Other Staff | 97.15 | 4.26 | 100.45 | 8.50 | 68.49 | 12.18 |
| Allowances | 360.44 | 15.80 | 164.63 | 13.94 | 100.12 | 17.81 |
| Subtotal Salaries | 2247.60 | 98.51 | 1056.10 | 89.41 | 518.00 | 92.13 |
| Books, Materials | 0.00 | 0.00 | 1.18 | 0.10 | 3.18 | 0.57 |
| Other Expenditures 2/ | 32.34 | 0.08 | 122.44 | 10.37 | 39.86 | 7.09 |
| Maintenance | 1.76 | 0.08 | 1.50 | 0.13 | 1.22 | 0.22 |
| Subtotal | 34.10 | 1.49 | 125.12 | 10.59 | 44.26 | 7.87 |
| Total | 2281.70 | 100.00 | 1181.22 | 100.00 | 562.26 | 100.00 |

1/ Separate primary schools in the Punjab do not have headteachers.

2/ Includes consumables, utilities etc.

SIND

| Category | Primary | % | Secondary | % | Colleges | % |
|-------------------------|---------|--------|-----------|--------|----------|--------|
| Heads/Administrators 1/ | 0.04 | 0.00 | 46.06 | 6.96 | 201.17 | 62.37 |
| Teachers | 756.90 | 72.61 | 472.75 | 71.41 | | 0.00 |
| Other Staff | | 0.00 | | 0.00 | 41.21 | 12.78 |
| Allowances | 224.40 | 21.53 | 133.01 | 20.09 | 73.55 | 22.80 |
| Subtotal Salaries | 981.34 | 94.13 | 651.82 | 98.46 | 315.93 | 97.95 |
| Books, Materials | 0.18 | 0.02 | 0.21 | 0.03 | 2.92 | 0.91 |
| Other Expenditures 2/ | 60.09 | 5.84 | 9.94 | 1.50 | 3.48 | 1.08 |
| Maintenance | 0.07 | 0.01 | 0.05 | 0.01 | 0.22 | 0.07 |
| Subtotal | 61.15 | 5.87 | 10.20 | 1.54 | 6.62 | 2.05 |
| Total | 1042.49 | 100.00 | 662.02 | 100.00 | 322.55 | 100.00 |

1/ Arts colleges only.

2/ At college level, most staff are in administrator grades.

3/ Includes consumables, utilities etc.

Source: Provincial Departments of Education.

TABLE A5.5: PROJECTED PRIMARY ENROLLMENTS, PARTICIPATION RATIOS, CLASSROOM AND TEACHER NEEDS, RECURRENT AND DEVELOPMENT COSTS ASSUMING SEVENTH PLAN GRADE ONE ENROLLMENT GROWTH TARGETS(6), 1988-2000

| year | 1988 | 1990 | 1993 | 1995 | 2000 | Seventh Plan Growth (1988-93) |
|------------------------------------|---------|---------|---------|---------|---------|----------------------------------|
| Primary enrollment: (,000) | | | | | | |
| male | 5166 | 5558 | 6679 | 7557 | 10294 | 1513 |
| female | 2973 | 3621 | 4835 | 5846 | 9398 | 1862 |
| total | 8139 | 9179 | 11514 | 13403 | 19692 | 3375 |
| Participation ratio (%) /1 | | | | | | |
| a. high pop growth | | | | | | |
| male | 64.2 | 64.6 | 71.2 | 76.5 | 91.6 | 7.0 |
| female | 40.5 | 45.8 | 55.7 | 63.8 | 89.3 | 15.2 |
| total (public) | 52.9 | 55.6 | 63.8 | 70.4 | 90.5 | 10.9 |
| total (incl. private enrol.) /2 | 57.7 | 60.7 | 69.5 | 76.8 | 98.7 | 11.8 |
| b. low pop growth | | | | | | |
| male | 64.2 | 64.6 | 72.0 | 79.5 | 103.0 | 7.8 |
| female | 40.5 | 45.8 | 55.7 | 64.7 | 98.0 | 15.2 |
| total (public) | 52.9 | 55.6 | 64.1 | 72.3 | 100.6 | 11.2 |
| total (incl. private enrol.) /2 | 57.7 | 60.7 | 69.9 | 78.8 | 109.8 | 12.2 |
| Total classrooms needed | 203,469 | 229,483 | 287,830 | 335,078 | 492,281 | 130,648 |
| Total teachers needed | 232,536 | 262,266 | 328,948 | 390,446 | 564,607 | 145,164 /4 |
| Recurrent cost /3 (Rs millions) | 4,204 | 4,780 | 6,211 | 7,698 | 11,309 | 24,266 /5 |
| Development cost /3 | 1,039 | 1,440 | 1,866 | 2,190 | 3,286 | 6,927 /5 |

Notes:

1. Includes over-age children.
2. Private school enrollment estimated at 10% of public school enrollment.
3. 1987 constant prices.
4. Additional teachers required, including wastage factor (5% of stock).
5. Cumulative cost during 7th Plan period.
6. Grade One enrollment growth targets are: boys +5.5% p.a.; girls +9.0% p.a.

Source:

Bank estimates

TABLE A5.6: SELECTED URBAN INDICATORS, 1970 and 1982

| | Access to Safe Water /a | | Sewage Disposal /a | | Number of Persons/Room) | |
|------------|----------------------------|-------|-----------------------|-------|----------------------------|--------|
| | 1970 | 1982 | 1970 | 1982 | 1970 | 1982 |
| Pakistan | 77 | 77 | 12 | 42 | 3.3 | 3.5 /b |
| Bangladesh | 13 | 26 /b | n.a. | 21 /b | n.a. | n.a. |
| India | 60 | 77 | 25 | 27 | 2.8 | n.a. |
| Sri Lanka | 46 | 65 | 76 | 80 /b | 2.7 | n.a. |
| Low Income | | | | | | |
| Asia | n.a. | 77 | n.a. | 29 | n.a. | n.a. |

/a As percent of total population.

/b 1980 data.

n.a. = not available.

Source: Social Data Sheets, World Bank, 1985.

TABLE A5.7: HISTORICAL AND CURRENT URBAN POPULATION ('000)

| | 1972 | 1981 | Intercensal Growth Rate(%) | 1985 |
|---|--------------|--------------|-------------------------------|--------------|
| <u>METROPOLITAN CITIES</u> | | | | |
| Karachi | 3,515 | 5,208 | 4.47 | 6,297 |
| Lahore | <u>2,170</u> | <u>2,953</u> | <u>3.48</u> | <u>3,404</u> |
| ST | 5,685 | 8,161 | 4.10 | 9,701 |
| <u>SECONDARY CITIES</u> | | | | |
| Faisalabad | 823 | 1,104 | 3.32 | 1,258 |
| Rarvalpindi | 615 | 795 | 2.89 | 905 |
| Hyderabad | 629 | 752 | 2.00 | 827 |
| Multan | 539 | 732 | 3.46 | 852 |
| Gryranivala | 324 | 601 | 7.11 | 803 |
| Peshawar | 273 | 566 | 8.44 | 795 |
| Sialkat | 204 | 306 | 4.46 | 366 |
| Sargodha | 200 | 291 | 4.25 | 349 |
| Quetta | 158 | 286 | 6.82 | 370 |
| Islamabad | <u>77</u> | <u>204</u> | <u>11.43</u> | <u>320</u> |
| ST | 3,842 | 5,633 | 4.34 | 6,872 |
| <u>OTHER CITIES</u> | 6,755 | 10,047 | 4.44 | 12,135 |
| <u>TOTAL URBAN</u> | 16,218 | 23,841 | 4.40 | 28,708 |
| <u>TOTAL POPULATION</u> | 65,309 | 84,251 | 3.00 | 96,180 |
| <u>PERCENT URBAN</u> | 25% | 28% | | 30% |
| <u>PERCENT URBAN IN KARACHI AND LAHORE</u> | 35% | 34% | | 34% |

TABLE A5.8: ESTIMATES OF PER CAPITA PUBLIC/PRIVATE URBANIZATION COSTS (1987 Prices)

| | <u>KARACHI</u> | | <u>LAHORE</u> | | <u>SECONDARY CITIES</u> | | <u>SMALL TOWNS</u> | |
|-------------------------------------|--------------------------|---------------|--------------------------|---------------|-------------------------|---------------|------------------------|---------------|
| | <u>private</u> | <u>public</u> | <u>private</u> | <u>public</u> | <u>private</u> | <u>public</u> | <u>private</u> | <u>public</u> |
| <u>NHSPS Low Cost:</u> | | | | | | | | |
| On-site development | | 1,300 | | 1,300 | | 1,000 | | 8,000 |
| Trunks infrastructure | | 10,000 | | 4,000 | | 3,000 | | 2,500 |
| Community facilities | | 3,000 | | 3,000 | | 1,500 | | 700 |
| Land 1/ House | 2,000 <u>18,000</u> | | 2,250 <u>18,000</u> | | 250 <u>14,500</u> | | 200 <u>13,000</u> | |
| | (TOTAL: 34,300) | | (TOTAL:28,300) | | (TOTAL:21,250) | | (TOTAL:24,400)..... | |
| <u>Alternative Standard:</u> | | | | | | | | |
| On-site development | | 1,000 | | 1,000 | | 750 | | 800 |
| Trunks infrastructure | | 5,000 | | 2,000 | | 1,500 | | 1,300 |
| Community facilities | | 1,500 | | 1,500 | | 750 | | 400 |
| Land 1/ House | 1,500 <u>9,000</u> | | 1,000 <u>9,000</u> | | 200 <u>7,300</u> | | 150 <u>6,500</u> | |
| | 10,500 (TOTAL:18,000) | | 10,000 (TOTAL:14,500) | | 7,500 (TOTAL:10,500) | | 6,650 (TOTAL:9,150) | |

1/ Opportunity cost of land. This is assumed to be 25% of nominal cost estimates in large and secondary cities. The other 75% would have to be added to determine financed cost to the private sector.

Source: Bank Estimates.

TABLE A6.1: TRENDS IN LAND UTILIZATION, 1950/51 - 1985/86

| | Area (mil.ha.) | | | Cultivable Waste (mil.ha.)/2 | Cropping Intensity (%) /3 | Irrigation Intensity (%) /4 |
|-------------------|----------------|---------|-----------|---------------------------------|------------------------------|--------------------------------|
| | Cultivated /1 | Cropped | Irrigated | | | |
| 1950/51 | 15.2 | 12.9 | 9.2 | 9.2 | 85.0 | 61.0 |
| 1960/61 | 18.1 | 14.9 | 10.4 | 12.5 | 82.0 | 57.4 |
| 1969/70 | 19.2 | 16.8 | 12.5 | 11.5 | 87.2 | 65.0 |
| 1974/75 | 19.6 | 17.4 | 13.3 | 11.2 | 88.8 | 68.2 |
| 1979/80 | 20.2 | 19.2 | 14.7 | 11.9 | 95.0 | 72.9 |
| 1985/86 | 20.7 | 19.8 | 15.8 | 10.5 | 95.8 | 76.2 |
| % increase | | | | | | |
| 1950/51-1969/70 | 26.3 | 30.2 | 35.9 | 25.0 | 2.6 | 6.6 |
| 1969/70-1985/86 | 7.8 | 17.9 | 26.4 | -8.7 | 9.9 | 17.2 |

Note:

/1 Covers both net area sown and under fallow.

/2 Composed mainly of areas around river banks, canals, etc.

/3 Cropped area divided by cultivated area.

/4 Irrigated area divided by cultivated area.

Source: As for Table 3.3.

TABLE A6.2: THE CONTRIBUTION OF CROPPED AREA TO OUTPUT GROWTH - MAJOR CROPS
1950/51 - 1986/87

| | Wheat | Rice | Cotton | Sugarcane |
|---|-------|-------|--------|-----------|
| <u>Increase in Cropped Area</u> (% p.a.) | | | | |
| 1950/51 - 1960/61 | 0.6 | 2.0 | 0.6 | 7.5 |
| 1960/61 - 1969/70 | 3.3 | 3.6 | 3.5 | 5.3 |
| 1969/70 - 1979/80 | 1.1 | 2.3 | 1.7 | 1.5 |
| 1979/80 - 1986/87 | 1.3 | 0.3 | 2.7 | 0.8 |
| <u>Area Contribution to Output</u> Growth (%) /1 | | | | |
| 1950/51 - 1960/61 | | 115.3 | 29.5 | 95.5 |
| 1960/61 - 1969/70 | 44.6 | 32.8 | 45.7 | 47.3 |
| 1969/70 - 1979/80 | 22.8 | 75.0 | 51.6 | 273.1 |
| 1979/80 - 1986/87 | 78.8 | 25.2 | 31.0 | 66.9 |

/1 Change in area cropped as a proportion of the change in output.

Source: As for Table 6.3.

TABLE A6.3: DISTRIBUTION OF FARMS AND FARM AREA BY LAND TENURE
OF OPERATIONAL HOLDINGS IN PAKISTAN

| Size (ha.) | Number of Farms (in millions) | | | | | | Farm Areas (in mil. ha.) | | | | | |
|---------------|-------------------------------|------|---------------------|------|--------|------|--------------------------|------|---------------------|------|--------|------|
| | Owner | | Owner-cum Tenant | | Tenant | | Owner | | Owner-cum Tenant | | Tenant | |
| | 1972 | 1980 | 1972 | 1980 | 1972 | 1980 | 1972 | 1980 | 1972 | 1980 | 1972 | 1980 |
| Less than 2 | 0.65 | 0.98 | 0.12 | 0.12 | 0.28 | 0.28 | 0.58 | 0.88 | 0.16 | 0.16 | 0.30 | 0.31 |
| 2 to 5 | 0.50 | 0.72 | 0.38 | 0.35 | 0.63 | 0.54 | 1.68 | 2.28 | 1.30 | 1.17 | 2.11 | 1.42 |
| 5 to 20 | 0.36 | 0.48 | 0.35 | 0.28 | 0.37 | 0.23 | 3.07 | 3.85 | 3.07 | 2.48 | 2.86 | 1.77 |
| 20 to Over | 0.06 | 0.07 | 0.05 | 0.04 | 0.02 | 0.01 | 2.61 | 2.92 | 1.62 | 1.20 | 0.59 | 0.30 |
| Total | 1.57 | 2.22 | 0.90 | 0.79 | 1.30 | 1.05 | 7.85 | 9.93 | 6.13 | 5.02 | 5.87 | 4.11 |

Source: Censuses of Agriculture, 1972 and 1980.

TABLE A6 4: USE OF FAMILY AND HIRED LABOR BY FARM SIZE, 1972 AND 1980

| Farm Size (Hectares) | Family Workers per Hectare of Crop Area | | Hired Labor per Hectare of Crop Area | | # of Households Using Permanent Hired Labor | | # of Households Using Casual Hired Labor | |
|-------------------------|---|------|--|------|---|-------|--|------|
| | 1972 | 1980 | 1972 | 1980 | 1972 | 1980 | 1972 | 1980 |
| 1.0 | 3.12 | 3.19 | 0.02 | 0.01 | 1.00 | 0.40 | 14.0 | 43.0 |
| 1.0 3.0 | 1.13 | 1.20 | 0.02 | 0.01 | 3.00 | 1.00 | 25.0 | 43.0 |
| 3.0 5.0 | 0.69 | 0.75 | 0.01 | 0.01 | 4.00 | 3.00 | 33.0 | 44.0 |
| 5.0 10.0 | 0.54 | 0.57 | 0.02 | 0.01 | 9.00 | 7.00 | 38.0 | 49.0 |
| 10.0 20.0 | 0.29 | 0.38 | 0.03 | 0.02 | 18.00 | 14.00 | 41.0 | 49.0 |
| 20.0 60.0 | 0.24 | 0.20 | 0.05 | 0.04 | 29.00 | 28.00 | 45.0 | 59.0 |
| 60.0 & Over | 0.10 | 0.07 | 0.07 | 0.06 | 45.00 | 45.00 | 51.0 | 61.0 |
| Average: All | 0.63 | 0.69 | 0.03 | 0.02 | 5.00 | 4.00 | 30.0 | 45.0 |

Note: These ratios have been calculated from data in Census of Agriculture, 1972 and 1980.

Source: Khan, M.H. (1987), "Pakistan's Agriculture Sector: Performance and Policies, 1971-1985," (February, mimeo).

**TABLE A6.5: FEMALE WORK PARTICIPATION RATES: FEMALE-SPECIFIC SURVEYS
AND COMPARABLE DATA FROM GENERAL SURVEY
(Married Women Aged 15-49, Percent)**

| <u>Year</u> | <u>Source</u> | <u>Urban</u> | <u>Rural</u> |
|-------------|---------------|--------------|--------------|
| 1968/69 | NIS | 9.0 | 22.3 |
| 1968/69 | LFS | (4.4) | (8.2) |
| 1975 | PFS | 15.6 | 18.1 |
| 1974/75 | LFS | (4.1) | (8.8) |
| 1984/85 | PCPS | 7.9 | 24.6 |
| 1984/85 | LFS | (4.6) | (12.1) |

Notes: Work participation rate = the ratio of those in the economically active population who are actually working to the total population aged 10 or above.

Source: M. Afzal and Z. M. Nasir: "Is Female Labor Force Participation Really Low and Declining in Pakistan? A Look at Alternative Data Sources", Paper presented at the Fourth Annual Meeting of PIDE, Islamabad, August 1987.

NIS = National Impact Survey
LFS = Labor Force Survey
PFS = Pakistan Fertility Survey
pcps = Pakistan Contraceptive Prevalence Survey