The Fertility Impacts of Development Policy in Bangladesh

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Introduction

Since independence Bangladeshi planners have shown an awareness of the ramifications of population growth and have investigated means of alleviating the consequences and controlling the tempo of increasing numbers. A basic objective of the First Five Year Plan 1973-78 was the reduction of poverty and the creation of employment for those currently unemployed or underemployed and for the ever growing number of new entrants to the labor force. On the assumption that work opportunities in non-agricultural sectors would remain circumscribed in the forseeable future the First Plan proposed an agriculture-based program. The strategy enunciated in the First Plan was that of employment-generating investments in irrigation facilities and in the package of high yielding varieties and practices, linked to policies aimed at strengthening the economic position of poor farmers and landless laborers. The First Plan also set the goal of sharply reducing continuing high population growth rates through intensified family planning educational activities and expanded delivery of contraceptive services to eligible couples.

Implementation of the First Plan was impeded by a sequence of floods and droughts of uncommon severity and by sharp increases in the cost of imported petroleum products and in the world market prices of foodgrains and edible oils. Besides the disruptions engendered by calamitous natural events and unexpected developments in the international economy, execution of the First Plan was affected by unanticipated resource scarcities and by organizational and administrative difficulties that are characteristic of rural-based approaches to development. Economic performance during the First Plan is assessed in the Second Five Year Plan 1980-85. The Second Plan reaffirms the national commitment to an employment-oriented, agriculture-based strategy, while describing a revised package of policies.

The Second Plan rests on a program of investments and altered production incentives in rural areas. As detailed in the medium-term foodgrain production plan (MTFPP), government initiatives aim at augmenting productive infrastructure and fostering technological innovation in the farm sector. In conjunction with this production-oriented approach, which is accorded prior claim on the limited resources available to the government, the Second Plan proposes government interventions to directly reduce rural poverty and to mitigate some of the consequences of rapid population growth. These initiatives include food rationing measures designed for the rural poor, rural works schemes for investment and employment generation, and devolution of administrative powers and functions to elected bodies at the local level such as the Union Councils, experimentation with agricultural credit programs directed at small farmers, and revamping the network of village cooperatives.

Along with measures intended to increase agricultural production and employment and to improve levels of living in rural areas the Second Plan also unveils an ambitious program of population control and family planning. The objective stated in the Second Plan is to reduce the crude birth rate from better than 43 per thousand in 1980 to 32 births per thousand by 1985; the total fertility rate is expected to fall from approximately 6 lifetime births per woman to 4.1 in 1985. These demographic goals are to be realized through a sharp increase in the overall contraceptive prevalence rate -- from approximately 14 percent of eligible couples in 1980 to 38 percent in 1985 -- and through changes in the mix of contraceptive methods favored by the population. The Second Plan looks to increased coverage and improved performance by fieldworkers as primary means of achieving higher contraceptive use. In particular, a larger number of outreach workers is to receive strengthened training and supervision, to be supported through enhanced

administrative, logistical, and technical backup and information and education activities, and to be assisted and complemented by private sector delivery on an expanded scale. The pattern and scale of service delivery and the details of administrative design, staffing, and programming in field locations are left in the Second Plan to experimental investigation. One such effort which has recently attracted attention is the Family Planning Health Services Project (FPHSP) underway in Matlab Thana in Comilla District (Phillips, et al.,1982). The fieldworkers in this pilot venture are young, literate, married women who are recruited from individual villages, and who receive intensive pre-service training followed by weekly in-service training sessions. The FPHSP features administrative supervision to insure that household visits and other tasks are performed on schedule as well as technical surveillance, overseeing referrals for IUDs and sterilizations, maternal and child health care, and other fieldworker activities.

Improvements in the family planning service delivery system envisioned in the Second Plan are expected to increase contraceptive prevalence to a 25 to 30 percent level by the end of the planned period. Evidence that these rates are within reach comes from the Matlab experiment where contraceptive use rose from 7 percent to 30 percent during the initial year of the project before levelling off at 34 percent (Phillips, et al., 1982). Indeed, FPHSP findings provide an indication, roughly and generously, of the level of current demand for family planning in Bangladesh. However, attainment of Matlab level user rates or more realistically of prevalence rates of 25 percent for the whole country would leave the program short of the 38 percent target set for 1985 and far below the 60-70 percent rates needed to achieve longer term demographic goals (Government of Bangladesh, 1981a). Accordingly, there is growing recognition in government and donor agency circles in Bangladesh that a breakthrough to higher prevalence

rates is contingent on measures to stimulate and sustain demand for means of fertility reduction. In this regard, the Second Plan is quite explicit about the need to explore "non-family planning" measures to reduce the economic value of children, to enhance acceptance of the small family norm, and in other ways to broaden the market for family planning (Government of Bangladesh, 1981a).

This report investigates opportunities in Bangladesh to pursue development policies which stimulate interest in and demand for family planning. The first section below examines the setting of demographic behavior and describes a framework designed to account for the persistently high levels of fertility recorded in Bangladesh. The framework introduced in this section draws attention to the importance of children as indispensable although costly means of insurance and adjustment in rural communities which are vulnerable to weather-related and market and institutionally based risks of income insufficiency. This framework is used in the second section to analyze likely fertility impacts of development policies under consideration or already being implemented. The risk hypothesis is also used to suggest modifications of the present development strategy that promise to have a significant impact on fertility. The discussion centers on the demographic benefits that might follow if government anti-poverty and employment generating initiatives currently encompassing a wide range of activities and policies, are reorganized and reconstituted as a guaranteed employment scheme offering secure income earning opportunities to all in need.

I. The Determinants of Fertility in Bangladesh: A Framework for Policy Analysis

(i) Introduction

There are few places on earth where the negative consequences of rapid population growth for economic welfare and development are as evident as in Bangladesh. The term "population pressure" has clear meaning in this country, distinguished as it is by an overwhelmingly rural population, extremely high population density, and a poor economy dominated by agriculture. The decade of the 1970s saw foodgrain production outpaced by the rate of population growth, declining real wages in agriculture, and steady erosion of the nutritional status of the rural population. While foodgrain production did not, in fact, keep pace with the rate of population growth over the last decade, it is important to emphasize that the current dependence on foodgrain imports, and the tenuous population-food balance, is arguably not the most pressing policy challenge attributable (at least in part) to rapid population growth. (Indeed, there is a reasonable basis for optimism concerning the prospects for a rate of growth in agricultural production in excess of projected population growth rates and foodgrain self-sufficiency in the near-term, given both the encouraging performance of the sector in recent years and the strategy outlined in the MTFPP.)

Rather, of most immediate concern is the current and prospective employment situation of the rural labor force. As noted in the USAID CDSS FY 1984 Update (USAID, 1982) the rural employment problem has serious implications for the country's agricultural production strategy, in addition to its immediate welfare implications for the rural poor: "Simply put, unless personal incomes rise in line with agricultural output, how will that output be

absorbed? Agriculture itself cannot create the required additional jobs and neither the BDG planners nor the donors have paid sufficient attention to the need for rural off-farm employment creation" (pp. 16-17).

In evaluating the current employment situation, one must appreciate that the impact of rapid growth of the rural labor force (which, considering past and prospective rates of urban expansion, will almost certainly exceed two percent per annum over the next decade) is exacerbated by two additional factors. First, (reflecting current high population density) average and median landholdings are already so small that population growth, through property division at inheritance, is creating a rapidly increasing proportion of non-viable farms — that is, farms whose output cannot sustain the farm family, and whose members must seek supplemental income through participation in the labor market or through some form of non-agricultural self-employment. Thus, the land/man ratio is estimated to have declined from 0.40 acres in 1960-61 to 0.29 acres in 1979-80 (Government of Bangladesh, 1981). For a representative sample of approximately 100 households in one Mymensingh village (interviewed in 1976) the partition of property at inheritance resulted in the following changes in mean and median ownership holding (the median date of inheritance for this sample was 1960):

	Father's holding immediately before partition	Son's holding immediately after partition
Mean holding (acres)	6.0	1.8
Median holding	4.1	1.1

Source: Cain, 1981.

Extrapolation of this trend quickly runs up against the "limits to growth."

Second, and related to the proliferation of small farms, the proportion of completely landless rural households has been increasing over recent decades and can be expected to increase further in the future. Constrained by limited access to credit, and confronted by periodic natural disasters and other threats to property and income, small farmers often must resort to distress sale of land to provide for family consumption needs. Whatever the precise rate of increase (one estimate by Clay and Khan [1977] places it between four and five per cent annually) there is no question that the pool of landless laborers has been growing more rapidly than the rural labor force as a whole. Already, a very high proportion of the rural population is landless: the Land Occupancy Survey of 1978 indicated that 29 percent of rural households owned no land other than homestead plots (Cain, 1981b).

Not only is the total labor force growing rapidly, therefore, but its composition is also changing dramatically towards increasing proportions dependent in whole or in part on wage employment or non-agricultural self-employment. The best evidence suggests that the agricultural sector, even with highly optimistic projections of output growth, cannot now nor will it in the future be able to absorb and provide employment for this rural labor force (Clay and Khan, 1977). Current estimates of rural underemployment are as high as 40 percent. A review of evidence on the impact of the seed-fertilizer-irrigation revolution on agricultural employment suggests employment elasticities relative to productivity per acre of no more than 0.5. To quote from the most authoritative recent analysis: "Alternative projections of growth in cereal production ranging from 2.9 percent to a high rate of 5.5 percent over the period of 1975/76-1985/86 are found to imply rates of growth in crop sector employment of between 0.9 and 2.1% only. When these projections are combined with optimistic rates of growth in potential employment in the

other agricultural subsectors, the absolute level of unemployment and under-employment is found to increase by between 2.2 and 3% a year over the next decade" (Clay and Khan, 1977).

There are four reasons why we have begun our discussion of the determinants of fertility in Bangladesh with brief mention of a major consequence of persistent high fertility and rapid population growth. First, small farmers and the landless, owing to sheer weight of numbers and the ever increasing proportion of the rural population that they represent, are the group whose reproductive behavior must necessarily come to dominate the attention of population policy. Second, as we shall argue, the employment situation, characterized by a competitive labor market, low wages, absence of job security, and high levels of unemployment and underemployment, itself creates an incentive for high fertility at the individual and household level. Under these circumstances, families have an incentive to maximize the number of earners and diversify sources of income in order to reduce the risk of major interruption of family income streams. Third, the major process underlying the transformation in composition of the rural labor force -- that is, the process of dispossession and distress sale of assets by which the landless are created — is symptomatic of features of the socio-economic and natural environments that also create a powerful economic incentive for parents to maintain high levels of fertility. Specifically, distress land sales can be viewed as one means by which cultivators adjust to a harsh environment of risk (in the absence of effective insurance against risk). The risk of unemployment in a competitive labor market is only one component of this environment: natural disasters, political depredation, the dependent position of women, and morbidity represent important additional sources of risk. This high risk environment creates an incentive for high fertility precisely because children,

particularly male children, can provide parents with insurance where few alternatives exist. Fourth, the principal policy prescription that follows from our analysis of the determinants of fertility and the fertility impacts of current development policy in Bangladesh -- that is, provision of broad based and versatile insurance through a program of guaranteed public works employment — attacks the single strongest economic incentive for high fertility in the country, while at the same time addressing the single most pressing consequence of rapid population growth — unemployment and underemployment of the rural labor force.

(ii) A Review of Mainstream Fertility Research

Any ex ante evaluation of the fertility impacts of development policy must be based on a correct understanding of fertility determinants in order to be useful in a particular setting. Because our view of the determinants of fertility in Bangladesh represents a departure in certain respects from the mainstream, we preface our presentation with a brief discussion of the traditional approach.

The theoretical foundations of mainstream research on the determinants of fertility in developing countries over the last few decades can be located in two sources: demographic transition theory and the micro-economic theory of consumer choice (Priorities Statement, 1981). Demographic transition theory is an attempt to distill from the historical experience of Western countries, those aspects of economic development and social modernization most closely associated with the transition of fertility from high to low levels. The theory of consumer choice, as applied to reproductive behavior, introduces children, or rather the services that children provide, as arguments in the household utility function. In this theory, children represent sources of

utility that entail costs and whose purchase given limited income must therefore be weighed in relation to expenditures on other consumption goods. This model directs attention at family income and at childrearing expenses as critical fertility determinants.

Neither of these foundations has proven fully satisfactory as a "window" on fertility determinants in the currently developing countries. And, while it would be incorrect to claim that there is a broad consensus as to what should replace them, there is a growing realization that they have failed to provide useful policy insights. In the case of demographic transition theory, there is, first, the critical implicit assumption that economic development in the Third World countries of today will follow the path of the historical West, with attendant rates of urbanization and industrialization. But who would now doubt, that Bangladesh, for example, will remain predominantly rural, with agriculture at the center of its economy, for the forseeable future? No one who is at all familiar with the country. Second, early representations of demographic transition in the West have proven vastly oversimplified, and subsequent close examination of the historical record has left few uncontested generalizations regarding the causal impact of any single social or economic indicator, or cluster of indicators, on fertility.

The economic theory of consumer choice has serious limitations in scope and is encumbered by a number of troublesome simplifying assumptions that, while ensuring tractability (i.e., the derivation of "testable," ceterus paribus, hypotheses), are at odds with the messy reality of developing countries (see McNicoll, 1978). If a major problem with demographic transition theory is the naive and stylized form of economic and institutional change that it presumes, the major limitation of consumer choice theory is that it focuses exclusively on the internal workings of the household, while abstracting from

the institutional, material, and cultural context in which the household is located.

The empirical research that these two traditions give rise to (and from which policy implications are typically derived) is similar. The task for empirical research is largely one of specification and estimation of the relationship between socioeconomic variables associated with modernization and economic development (in the case of demographic transition theory), or that are presumed to alter the price of children (either directly or through the opportunity costs of childrearing) or income (in the case of consumer choice theory), and fertility. Typically, the same variables appear in the empirical specifications regardless of which approach is taken: education, for example, or female employment status. This mode of research has proven frustrating for two reasons. First, detailed results often show inconsistencies: such key variables as income, education, and female employment status are found to have different estimated effects in different settings. Second, due to a high degree of abstraction and inadequate empirical grounding, the available theories are not up to the task of interpreting whatever statistical relationships are found. To quote a recent review of this literature: "Too often, analyses that focus on the relationship between variables measured at the individual or household level end in tentative speculation as to why a certain relationship is or is not found. What should be called for instead are fresh attempts to elaborate empirically grounded theories of the social, economic, and decision processes that yield individual-level statistical associations" (Priorities Statement, 1981).

A recent review of the literature on fertility determinants in Bangladesh (Alauddin, 1980) serves as a case in point. The preponderance of the literature reviewed was of the kind just described: that is, statistical

estimates of the relationship between socioeconomic variables and fertility, measured at the household or individual levels. This exhaustive survey, with one exception, failed to find any substantively significant or consistent relationships between marital fertility and such familiar variables as female education, female labor force participation, religion, and urban-rural residence. The implications of the one distinct association that was found -- a positive correlation between land ownership and marital fertility — are far from clear. First, the fertility differentials observed, while statistically significant, are of questionable quantitative significance. The best available study, for example, found total marital fertility rates of 6.8 among the landless, 7.1 for those with less than one acre, 7.3 for the group with 1-1.9 acres, 7.4 for those with 2-2.9 acres, and 7.7 for those with 3 or more acres (Stoeckel and Chowdhury, 1980). Second, there are a number of sociobiological factors, having nothing to do with systematic differences in family size preference or deliberate efforts to control marital fertility, that can explain the positive association between land ownership and fertility: poor health and nutritional status are associated with a higher incidence of foetal mortality (Stoeckel and Chowdury, 1980); breastfeeding has been found to be of longer duration among the poor (Huffman et al., 1977); there is evidence that coital frequency is lower among the poor (Maloney et al., 1981); and separation of spouses tends to be greater among the poor due to patterns of temporary labor migration (e.g., Cain and Mozumder, 1981).*

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* Data on time use from Bangladesh permit the estimation of the fertility effects of class differences in spouse separation. The data come from a village study where the time use of a representative sample of 424 adult males and females was recorded for one day every two weeks (approximately) over the course of the year 1977 (methods are described in detail in Cain and Mozumder, 1981). This sample yielded a total of 8807 days of observation. For that half of the sample owning either no arable land or less than half an acre, spouses were separated on average for 87 days (overnight absences) out of the year (of

The failure to find systematic differentials in household fertility in Bangladesh is hardly surprising. This is to be expected in a setting where fertility approaches "natural" levels — that is, where there is little attempt to limit fertility within marriage -- and thus where interpersonal differences in fertility (controlling for age) are largely a matter of chance. What is surprising is the amount of research (as reflected in Alauddin's voluminous bibliography) that has been devoted to searching for such differentials.

We note, finally, two stark facts that confront any population policy analysis in Bangladesh. These are, moreover, two realities that fertility research of the traditional type has not adequately come to grips with. First, is the urgency of the problems created by continued rapid population growth in Bangladesh, and the need to formulate policy that reflects this urgency. There are a number of frequently prescribed public interventions originating from mainstream fertility analysis (the expansion of female school enrollment, for

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which 57 days were due to work-related absences of the male spouse, and 30 days were due to the absence of the wife -- normally on unaccompanied visits to her family of birth). Among those owning a half acre of arable land or more, spouses were separated on average for 54 days during the year (of which 12 days were due to male, work-related, absences, and 22 days were due to the absence of the wife). Therefore, the difference between the relatively rich and poor in the separation of spouses is 53 days -- almost two months. Bongaarts and Potter (1979) have simulated the effects of different periods of separation on fertility. Their model assumes population parameters — such as mean age at marriage and expectation of life at birth — that closely approximate conditions in rural Bangladesh. With additional assumptions concerning fecundability, risk of foetal death, and mean nonsusceptible interval associated with a live birth (27 months), that are appropriate for Bangladesh, the simulation model suggests that the additional period of separation experienced by the poor (53 days) reduces their fertility by 5.9 percent relative to the more wealthy, from a TFR of 7.30 to a TFR of 6.87. Regrouping of the data presented by Stoeckel and Chowdhury, to correspond more closely with our two categories of landownership, yields Total Marital Fertility Rates (TMFR) of 7.42 for women in families with one or more acre, and 6.97 for women in families with less than one acre. The TMFR of the relatively poor in this case is 6.1 percent less than that of the more wealthy — a difference that could be explained entirely by class differences in periods of spouse separation (bravely accepting, that is, the generality of the results from a single village).

example) whose eventual impact on fertility, in the medium- or long-term, few would deny (assuming that such expansion is accompanied by additional developmental change — including changes in the structure of the economy that provide occupational outlets for the educated). Such prescriptions do not, however, address short-term needs, nor, in our view, do they match the urgency of the situation. Educational expansion in a vacuum is not, of course, what is called for in such prescriptions. Rather, it is education combined with concomitant change in the structure of labor markets and occupations that may have provided fertility depressing linkages in certain settings. The second reality confronting population policy analysis in Bangladesh is, however, that solutions to the predicament of high fertility and rapid population growth must be sought in currently existing social and economic circumstances, without the presumption that overall "development" is now proceeding, or will necessarily proceed, along the classical Western path. As noted, Bangladesh will remain predominantly rural and agricultural for the forseeable future, and it is in this context that the policy debate must be carried out. The operative question should be: how does one achieve a significant fertility transition in the absence of Western-style economic development?

(iii) An Alternative Approach to Fertility Analysis

There is a promising alternative to the traditional mode of fertility analysis, to which we now turn. This alternative approach places emphasis on a detailed knowledge of the institutional and material setting of reproductive behavior. It asks the question: how do social, economic, political, administrative, and cultural structures create fertility incentives or disincentives or otherwise impinge on individual reproductive behavior? As in the economic theory of consumer choice, the costs and benefits of children to

parents are seen as having an important determining influence on fertility decisions. However, in this approach, greater explicit weight is given to the productive value of children, and the focus of inquiry is broadened to include the institutional underpinnings of the costs and benefits of children.

We are fortunate in that some of the best available work to have addressed this question, work that represents a model of the institutional approach to the determinants of fertility, has been carried out in Bangladesh. We refer particularly to the analysis of population and development completed by Arthur and McNicoll in 1978 that, with some elaboration, is as pertinent now as it was then. As an overview we can do no better than quote at length from a terse synopsis of the section of their analysis that dealt with fertility:

"Fertility in rural Bangladesh apparently has been roughly constant over recent decades, with a crude birth rate slightly over 40 per thousand. (Higher birth rate estimates also exist, but similarly without indications of significant declines.) The level is consistent with a population that has a very low female age at marriage and shows little use of contraception but where lengthy breastfeeding is practiced and couple separation resulting from death, divorce, or occupational migration is an appreciable factor depressing birth rates. These are all characteristics of the present Bangladesh situation.

"Why fertility should stay at this high level, at a rate that, with present mortality, doubles the population in a generation, can be seen by looking at the opportunities and constraints facing individuals. First, there is an apparent economic rationale for large family size. For affluent landowners, children represent opportunities for the family's occupational diversification and hence for expansion or consolidation of its local power. Lower down, among middle and poor peasants, the evidence suggests that children become net producers early (by about age 12 for the average male child), while

the consumption costs of early childhood tend to be sheltered within a patrilineal family; in addition, sons who have reached majority by the time their father dies are an important source of security for the widow and indeed for the family's assets.

"Second, preserving the 'prisoner's dilemma' aspect of the setting, the pattern of social organization in rural Bangladesh militates against the emergence of social pressures at the local level (or administrative pressures from higher levels) able to oppose high fertility. What are the outlines of this organization? The groupings most distinguishable in what to many observers is a comparatively atomistic society are based on kinship and patron-client ties. Clans, surrounding prominent families, may exert wide-ranging authority over their members' behavior, including marriage and disposition of property. Larger factional groups, also typically with a lineage core, and with a fluid territorial base, dominate the local political landscape and to a large extent monopolize relations with higher levels of government -- including having a major role in agricultural factor and product markets. In contrast, for reasons found in Bangladesh's geography and colonial history, hamlets, locally defined villages, and administrative villages all have little role in the society -- certainly in comparison with their significance in much of the rest of South and East Asia.

"High fertility is no direct threat to the economic or political interests of kin and patronage groups -- interests that in essence are those of the dominant families within them. The numbers and rights of the fringe membership of such groups can adjust to permit maintenance or further accumulation of per capita resources at the core. Families at or beyond the margins of the patronage system bear the major part of the short-run costs of continued high fertility in the society, although costs are also shared more widely through

the high levels of economic and mortality risk and through the uniformly disadvantaged position of women. In the longer run, the society is in a sense transferring demographic costs forward in time, mortgaging its own future generations. For a transition to low fertility to occur in Bangladesh, if this analysis is correct, the institutional setting would have to shift in such a way as to lessen either the opportunity for shedding demographic costs in this manner or the advantage of doing so" (McNicoll, 1980).

This analysis suggests that there are two possible points of leverage upon which public policy could focus. The first would be to "lessen...the opportunity for shedding demographic costs;" that is, containing the negative externalities of individual and group reproductive behavior through drastic administrative reform. However, while it seems that some degree of administrative reform is extremely important, if not essential, for the achievement of a range of current policy goals in Bangladesh (including population policy), the prospect of reform to the extent required to "bottle up" demographic costs appears dim. Social engineering on such a scale represents an enormous undertaking, requiring a high degree of political will and power, and quantities of human and material resources that Bangladesh does not at present possess. The current bases of social organization -- kinship and patronage -- could not easily be subverted, and these, combined with the historical social insignificance of local and administratively defined villages, present formidable obstacles to such a program.

The second point of leverage suggested by the analysis is to lessen the advantage of "shedding demographic costs." This implies undermining the economic rationale for large family sizes. Of the two, this, in our view, presents the most promising line of attack.

(iv) The Risk Hypothesis

The framework for policy analysis proposed here focuses on the economic value of children in rural areas of Bangladesh, and specifically on their value as insurance against economic risk. Recent research has strongly suggested that the persistence of high fertility in Bangladesh can be attributed to a highly insecure environment in rural areas (Cain, 1981). Children represent a means of transferring income and spreading consumption over time and a form of security against the death or illness of the household head or other family members with important economic responsibilities (Cain, 1978). Children can also prove valuable as means of insurance and adjustment in the event of "subsistence crises" triggered by flood or other natural causes, theft or forcible expropriation of land and other assets, and price fluctuations and assorted manifestations of market failure. Market-based insecurities would encompass phenomena such as labor shortages at critical periods in the agricultural calendar from the standpoint of cultivators, and intermittent unemployment on the side of labor (Cain and Mozumder, 1981).

The susceptibility of poor households to downward fluctuations in income has been exacerbated by population growth, which has engendered greater land fragmentation, increased competition for jobs, and has contributed to a downward shift in the ownership and operational distributions of land holdings. In addition, the advent of new plant varieties, techniques, and labor utilization patterns, and a shift to more market-oriented forms of agriculture have increased the incidence and scope of various production-related risks. For example, improved seeds are often less resistant than traditional species to infestations, viruses, drought, and weather fluctuations and more sensitive to microclimatic variations. The yields obtained through the use of sophisticated new technologies may be reduced by incorrect or ill-timed

application of inputs by inexperienced and poorly educated cultivators. The shift from diversified, subsistence-oriented forms of agriculture to specialized production of improved varieties has increased vulnerability, not only to natural factors and deficiencies of farming information and expertise, but to changes in output prices and to disruptions in input flows and in the availability of credit.

In the face of a generally worsening climate of risk, the options and fallback mechanisms available to poor households appear to have narrowed in recent years. On the one hand, subsistence guarantees once embodied in landlord-tenant arrangements, patron-client relationships, access to underutilized land resources, and horizontal ties to kinfolk and neighbors are generally no longer available (Cain, 1982). On the other hand, market- or institutionally-based forms of protection and risk-sharing have yet to emerge. More generally, poor families lack effective access to market-based means, through near-term or future transactions in factors, goods, or credit, of spreading and reducing risks of income insufficiency.

In the generally unfavorable environment of risk which prevails in rural Bangladesh, children represent an important means of insurance for many households. Indeed, the protective function of children may have supplanted their directly productive role in the household labor force. While children typically yield a surplus on parents' cumulative investment by age 15, it is doubtful whether children in land-deficient, low income families have a net present value at birth as economic assets greater than zero (Cain 1977, 1982). However, as security guarantees and means of deferring consumption what matters is not whether the rate of return to children is positive but whether it is less negative (and uncertain) than the rates of return (and degrees of risk) associated with alternative investment strategies and forms of insurance

(including holding cash, precious metals, and so forth). Here it should be noted that children have various desirable characteristics as assets and security guarantees (Lieberman, 1980). First, child "insurance policies" remain relatively inexpensive to individual parents even though the social costs of high fertility have increased. Second, children have low fixed costs as investment goods and their incremental, maintenance costs to parents are conveniently spread over a ten to fifteen year period. Third, children are "inflation proof" and therefore are attractive investments in a setting where prices are rising rapidly and persistently. Finally, children are unlikely to be confiscated or stolen, while in-house socialization, training, and parental control of property, age of marriage, and career choice provide means of increasing the probability that children will yield expected benefits. Of course, investments in child insurance policies are themselves risky ventures, especially in the presence of high infant and child mortality and in situations where children may fail to recognize obligations to parents. The latter may occur because of the limited extent of parental property, because of sibling rivalry over inheritance shares, or because of the opening up of earning opportunities beyond the reach of parental controls or sanctions. In such circumstances, what is indicated is diversification of the investment portfolio — higher birth rates and lower levels of expenditure per child.

(v) Bangladesh in the Broader Context of South Asia: A Comparative Perspective

Bangladesh presents a stark contrast even to neighboring countries in South Asia both in the harshness of its environment of risk and in the paucity of effective means of insurance. Because the value of children as a source of insurance is directly related to the degree of insecurity in a given setting,

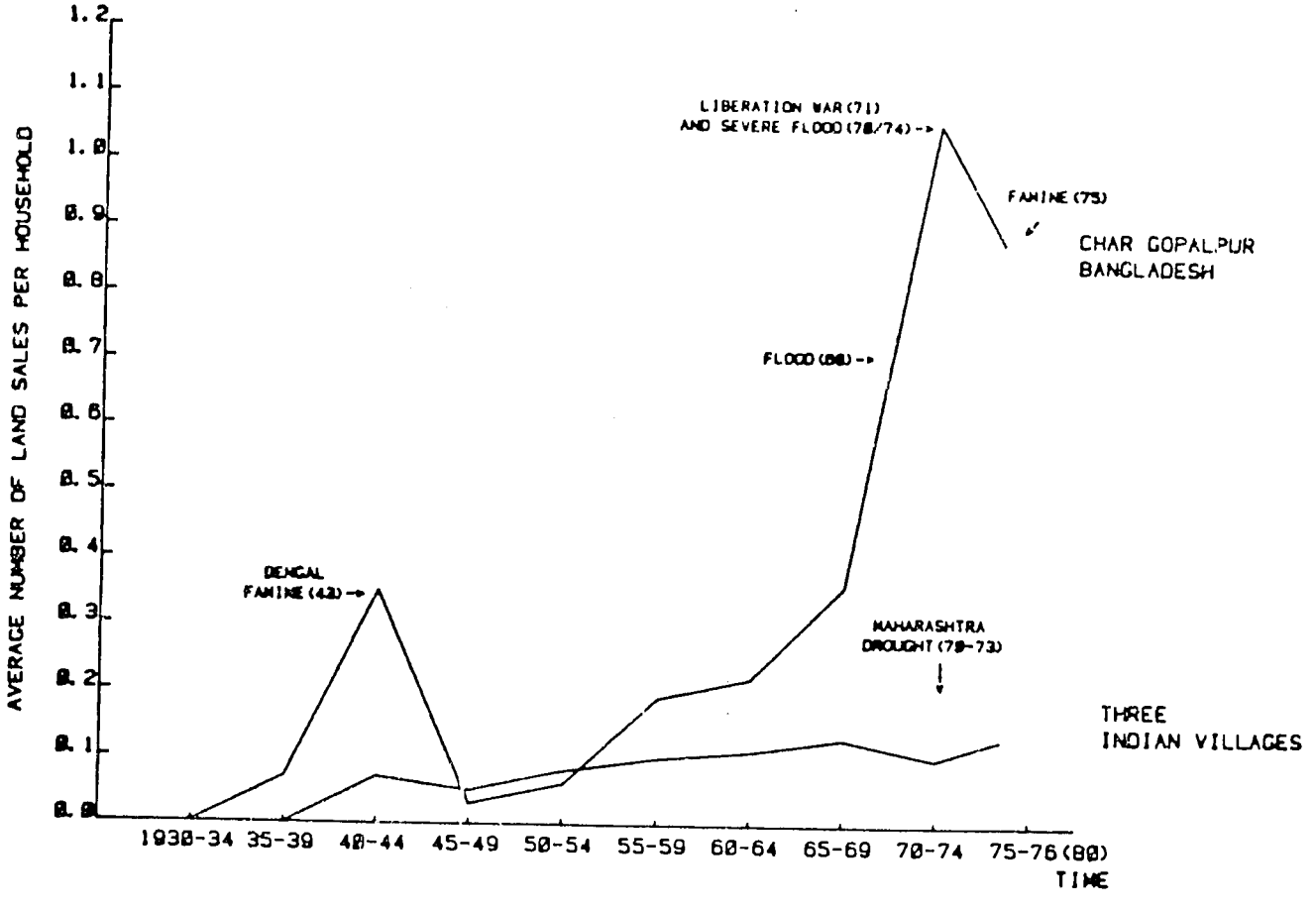
and inversely related to the availability of effective alternative forms of insurance, it is important to appreciate this fact. Similarly it is important to recognize the diversity in sources of risk that characterizes rural Bangladesh and the varying vulnerability of different population subgroups.

Little need be said about the level of weather-induced risk, and the incidence of natural calamities and other community-wide disasters; the litany is all too familiar: three successive years of bad floods from 1968 to 1970, the worst cyclonic storm of the century in 1970, war in 1971, flood and famine in 1974 and 1975, the Sylhet floods of 1977, and the drought of 1978 and 1979. A sense of the magnitude of weather-induced risk, its implications for the rural population in the absence of adequate protection, and the contrasting situation of Bangladesh in relation to neighboring countries, is given in Figure 1.

Figure 1 compares the frequency of land sales over time in one locality of Bangladesh and three villages located in semi-arid tropical India (in the states of Maharashtra and Andhra Pradesh). The data for Figure 1 were collected from samples of approximately 120 households in each setting (Cain, 1981). In the miserably poor conditions of both these settings, distress sale of land is a means of last resort as an adjustment to risk. Given the objective of maintaining minimally adequate consumption streams, sale of land is the least attractive means of smoothing such streams. However, the great majority of sale transactions recorded for the Bangladesh village — 80 percent — were distress sales made for the purpose of purchasing food and other life supporting necessities.

The contrast between India and Bangladesh in response to natural disaster is dramatic. The frequency of land sales in the Indian villages remained low and almost constant over the period in question, despite a series of natural

Figure 1: FREQUENCY OF LAND SALE TRANSACTIONS IN INDIA AND BANGLADESH



disasters of comparable magnitude to those occuring in Bangladesh, including the extended Maharashtra drought of the early 1970s. By contrast, the frequency of land sales, almost all reflecting distress, soared in response to the series of calamities that beset Bangladesh in the late 1960s and early 1970s. The same analysis from which Figure 1 is drawn showed, in addition, that the periods of high volume distress sales were also periods of acceleration in the trend toward increasing inequality in the distribution of land assets (Cain, 1981). That is, although all classes of cultivators were subject to some loss in the face of natural disasters, the relatively small farmers were at greater risk of distress sale.

While Bangladesh does indeed have a harsher environment of risk than most parts of rural India (particularly because of the presence of such additional sources of risk as political depredation and lawlessness), the major explanation for the contrast in frequency of distress land sales lies in the availability of insurance. In the three Indian localities, relatively cheap credit from formal institutions was accessible even at the height of the drought, while credit is much more dear and generally available only from informal sources in rural Bangladesh. More importantly, in the Indian setting, particularly in the state of Maharashtra, the timely provision of a variety of forms of public relief, including public works employment, served to carry people through the worst periods of crises and avert resort to distress sale of land. The Maharashtra Employment Guarantee Scheme, a state-wide, on-going public works program that grew out of relief programs initiated in response to the Maharashtra drought, continues to provide a "safety net" to the rural population of that state. By contrast, during the flood and famine of 1974-75, no comparable relief effort was undertaken by the Government of Bangladesh.

A close look at the pattern of land sales, and the distribution of famine distress in the Bangladesh village referred to in Figure 1, reveals that the resilience of households, the success with which they were able to avoid distress, was clearly related to their demographic composition — most particularly with respect to the number of able-bodied males in the household. Mature sons present opportunities for spreading risk and reducing household vulnerability through diversification of income sources, temporary migration for work, and as labor reserves in case the head of household falls ill or dies. In the atmosphere of high risk and meager insurance that prevails, it is natural that children emerge as the focal point of parental security concerns, and that they are highly valued as security assets.

(vi) The Special Case of Women

Women in Bangladesh represent a group that is particularly vulnerable to risk because of their position of extreme economic dependence. As such, they have a special incentive to minimize risks and seek insurance in the form of sons. We would agree with the many others who perceive that the low and dependent status of women in Bangladesh is a major obstacle to appreciable fertility decline. We take issue, however, with the typical reasoning behind this conclusion, and offer, instead, an interpretation that is consistent with our risk-framework of analysis. The interpretation adopted has a great deal of bearing on the choice of remedial policy.

Analysis of the relationship between female status and marital fertility typically focuses on the opportunity costs of childrearing: the negative impact that female labor force participation and education have on fertility by raising the opportunity costs of childrearing. In Bangladesh, where, as is well known, the status of women and their participation in economic activity

are unusually low, it is often suggested that the correspondingly low opportunity costs of childrearing are a major reason for the persistence of high fertility. The associated policy prescription is expansion of female education and female labor force participation.

In our view, there are several difficulties with this approach. First, is the problem of time horizon alluded to earlier. Even if the analysis is correct, the associated policy prescription is hardly responsive to the need to act decisively in the near term. Certainly, given the fact that women in rural areas are almost completely excluded from participation in the major agricultural field operations, the opportunity costs of childrearing are very low. However, and this is the second problem, there is a good deal of evidence from otherwise similar agricultural societies that even if women were to participate fully in field operations, such work is not seriously incompatible with childrearing. Third, such analysis tends to underestimate the considerable force of the current division of labor by sex, and the complexity and power of the institutional structure that underlies the current system. To quote from a recent analysis of the status of women in Bangladesh: "The picture that emerges from our analysis of patriarchy and women's work in rural Bangladesh is bleak. Male dominance is grounded in control of material resources and supported by interlocking and reinforcing elements of the kinship, political, and religious systems. Powerful norms of female seclusion extend to labor markets, severely limiting women's opportunities for independent income generation. At the same time evidence suggests that under the pressure of increasing poverty, male bonds of obligation to support women are weakening, thus creating increasing numbers of women who must fend for themselves. Potential agents of change and sources of resistance to the current system of patriarchy are undermined by the interaction of age, sex, and

class hierarchies. Among women, solidarity and potential resistance to patriarchy are undermined by an age hierarchy that allies older women with patriarchal interests and by class differences between women. Moreover, the institution of purdah confers social status upon women, while at the same time serving as an instrument of repression. Similarly, among poor men, for whom the material benefits of patriarchy are less than for the relatively rich, and whose well-being might improve if their wives could find more employment, potential resistance is blunted by their position of dependence in the class hierarchy" (Cain, et al., 1979). Fourth, and most important, the analysis overlooks the fact that with respect to fertility determinants, the whole issue of costs may be subordinate to the positive incentive that women have to reproduce and to acquire sons in response to their vulnerability to risk and their need to insure against risk. In this latter view, policy would focus not on female employment per se (in order to influence the opportunity costs of childrearing), but rather on provision of insurance (in order to reduce the dependence of women on children for security).

It is important to note that, in addition to the risks faced by all households in rural Bangladesh, women face the possibility of sharp declines in economic welfare in the event of widowhood, divorce, or separation. The strictures of purdah and other elements of the patriarchal system severely limit economic opportunities for women alone, and, without a man on whom to depend, their prospects are poor. In the same village referred to earlier, the fate of widows who had no mature sons or other men to depend on during such crises as the flood of 1974 was uniformly grim: all of those who had land to begin with lost some through distress sales, and many lost all of their land (Cain, 1981).

(vii) Concluding Comments

We have thus far focused exclusively on the positive reproductive incentive associated with children as insurance against risk. We have stressed the exceptional characteristics of rural Bangladesh in South Asia with respect to both the harshness and diversity of its risk environment, and the absence, there, of effective forms of insurance. Without any further discussion, we would suggest that sustained fertility decline in Bangladesh cannot be achieved without eliminating, or substantially reducing, this incentive. Therefore an attack on the risk-insurance-fertility nexus is, we would argue, a necessary condition for fertility transition in Bangladesh. The question remains, however, would such an attack be sufficient to induce a substantial fertility decline? Our answer would be yes to this question. Note, it is conceivable that even if the insurance motive were removed, high fertility might persist if the cumulative value of children continued to exceed the costs of childrearing to parents. However, in rural Bangladesh this is most unlikely to be the case. Evidence suggests first, that other sources of economic utility derived from children -- old age security and child labor -- when weighed against the cumulative costs of children, cannot justify unconstrained (natural) fertility on economic grounds (for an extended discussion, see Cain, 1981a and 1982). Therefore, in the Bangladesh setting, elimination of the insurance motive for reproduction would result in a shift in the benefit-cost ratio such that unconstrained fertility would yield a net loss. Second, we would predict that parents in rural Bangladesh would be sensitive to such a shift, and adjust their reproductive behavior accordingly, because of another exceptional feature of the society -- its extreme poverty. One can think of many societies where decisions about family size are influenced primarily by non-economic concerns; where a certain family size is targeted by parents despite the substantial net

economic costs thereby generated. At high levels of fertility, however, this sort of behavior represents a luxury that is associated only with a certain freedom of choice that comes with affluence. Such freedom does not exist in rural Bangladesh, where poverty is widespread, and only a tiny minority of the population could safely ignore issues of cost. There, the marginal utility of income is high and the costs of children's consumption represent a substantial proportion of a family's budget.

We feel that the evidence in support of the risk hypothesis of fertility determinants in Bangladesh is sufficiently strong to warrant serious policy consideration. This evidence, it should be emphasized, is not to be found in interpersonal or inter-household fertility differentials. While certain sub-groups of the population can be identified as being at greater or less risk (e.g., coastal populations exposed to cyclones versus inland populations) and certain classes may be better able to self-insure than others (e.g., those who are relatively wealthy), these differences in circumstance do not lead one to expect associated fertility differentials, because even for those groups that are most favorably situated with respect to risk and insurance, the environment of risk remains sufficiently harsh and sources of insurance sufficiently inadequate to warrant natural fertility levels. Rather, evidence is to be found in an appreciation of the extraordinary frequency and severity of economic crisis in rural Bangladesh, the meager means by which households can protect themselves, and the fact that children reduce the vulnerability of households to economic decline in times of crisis.

The broad implications for policy informed by this hypothesis are clear enough: the objective would be to either significantly alter the environment of risk or introduce effective alternative means of adjusting to risk. We conclude this section with several comments on the scale of effort implied by

the latter objective. First, the economic incentive for high fertility created by the current environment of risk is powerful. One need only consider what is at stake for rural households -- what is normally irrecoverable loss of land or other assets, and, possibly, starvation -- to see how powerful the incentive is. Reproduction, viewed as a means (often the only means) of self-insurance, will, therefore, not be easily altered or manipulated by public policy. This implies that the Government must be prepared to commit substantial resources in order to have a significant impact on fertility. Second, the diversity of sources of risk, the pervasiveness of risk throughout the population, and the mixture of threats to whole communities with more idiosyncratic threats to individuals, argue for the provision of broad-based insurance which is flexible enough to accommodate the diversity in sources and levels of risk. Third, successful policy must take heed of the special vulnerability of women in Bangladesh.

II. The Fertility Impacts of Development Policy in Bangladesh

(i) Introduction

The framework articulated in the previous section can be used 1) to explore implications for fertility behavior of development policies and activities envisaged in the Second Plan, and 2) to suggest policy adjustments that would enhance prospects for an early fertility decline in Bangladesh. Reduced to bare essentials, the risk hypothesis attributes persistent high fertility to the value of children as all-purpose security assets and means of protection in volatile environments; fertility decline is anticipated as a consequence of changes in the climate of risk which lessen the need for children as insurance policies.

(ii) "Non-Family Planning" Initiatives Suggested in the Second Five Year Plan

One set of policies which deserves attention from the vantage point of the risk framework is the group of measures mentioned in the Second Plan as likely to influence fertility behavior. These suggested "non-family planning" initiatives include improved career opportunities and perquisites for government employees with small families, and changes in revenue and civil codes aimed at encouraging late marriage and denying income tax exemptions and transfer payments to high parity couples. Administrative and legal measures such as these are important, within the bureaucracy and within the society as a whole, as symbols of the government's determination to achieve fertility reduction in Bangladesh. However, the direct demographic impact of these policies is likely to be minimal because of the numerical insignificance of the groups primarily affected -- civil servants and other government personnel, public and private sector employees liable for income tax payments -- or

because of the impossibility of enforcing upward changes in age of marriage. A second set of measures detailed in the Second Plan aims at enhancing female status and welfare by broadening educational and employment opportunities. These policies which include stipends to students, financial support to job training and preferential treatment for women in the labor market bear close attention because of the likely relationship, outlined above, between low female status, pervasive insecurity and vulnerability to disaster, and high fertility. The proposed initiatives represent elements essential to a long term decline in fertility in Bangladesh. In the immediate future, however, such educational and labor force policies, which to be effective must necessarily be preceded or accompanied by large scale investments leading to economy wide structural changes and significant growth of non-agricultural employment, seem fated to have but a marginal impact on the position of women in Bangladesh. Clearly, the low status, the appalling vulnerability, and the persistently high fertility of Bangladeshi women must be addressed in the short term through other government interventions.

Finally, the Second Plan suggests a bond scheme that would provide a guaranteed income in old age to low parity couples. This proposal is intriguing because it attempts to devise a substitute for children in their role as long term assets and insurance policies. However, the bond scheme idea is encumbered with problems. One difficulty arises out of the requirement that participants in this pension-like arrangement agree to accept a permanent method of contraception. This stipulation effectively reduces the coverage of this program to the small number of areas in Bangladesh with facilities sufficient to perform large numbers of sterilizations. The insistence on sterilization could of course be waived and participants could be permitted to use conventional means of contraception. Such a step would however saddle the

government with the high (and unsustainable) costs of preventing fraud and noncompliance by purported beneficiaries of a narrowly focused pension scheme. Another problem is that a pension-like program such as that mentioned in the Second Plan fails to protect against various harmful eventualities that threaten households in the short run and medium term. Theoretically, it would be possible for the government to offer income support in old age as well as insurance against contingencies such as accident, premature death, and unexpected decline in income because of disaster or the like. Financial and administrative constraints make it unlikely though that the government would be able to organize and operate a program of comprehensive protection in a setting where private firms have found it impossible to market insurance policies. For example, a viable, large scale government program would have to overcome such apparently insurmountable obstacles as high costs of servicing customers and collecting premiums whose flow is often interrupted because of marked variations in income, and difficulties of placing individuals in various risk categories, accurately determining the magnitude of risks of income loss, unemployment, and so forth because of crop failure, incapacity and the like, monitoring outcomes, and protecting against fraud. An inference that might be drawn from this discussion is that the provision of substitutes for children in their role as protective assets poses complex problems. Instead of attempting to establish specialized insurance schemes which are separately constituted and administered it appears that the protective needs of the population can best be addressed through pursuit of production, employment and social welfare policies which have desirable consequences for household security. In the following paragraphs, the program of the Second Plan is evaluated from the vantage point of alleviating insecurity and providing a modicum of protection to vulnerable rural households.

(iii) The Medium-Term Foodgrain Production Plan

As noted in the introduction, Bangladesh's development strategy rests on a growth-oriented program of investments and revised incentives in the farm sector. Alongside of measures intended to increase productive capacity, the government is pursuing or considering various policies aimed at intensifying use of and broadening access to income-generating assets and services, alleviating poverty, and more generally, altering the institutional setting in which agricultural growth takes place. These initiatives, ongoing or contemplated, include continued development of a network of multipurpose village cooperatives, experimental approaches to the delivery of credit, rural works and employment generating schemes of varying focus and administration, investment in designated "rural growth centers," strengthening the four-tiered system of local administration, and implementation of an agricultural income tax.

Of the disparate elements in the planned development strategy the core investment program is the most carefully formulated and has been accorded prior claim on the government's scarce resources. Additional components are described with less specificity and coherence in the Second Plan and other planning documents. The desired phasing and the ultimate size and scope of these interventions remains under investigation. More generally, the diverse measures proposed in the Second Plan have yet to be blended together into a sustainable and consistent package. Because the overall shape and the detailed content of the development effort remain in doubt, we explore implications for fertility of discrete programs and activities.

We begin with the Medium-Term Foodgrain Production Plan (MTFPP), a program of public and private investment in the agriculture sector. The MTFPP consists of government expenditures on irrigation, flood control, and drainage

structures, on feeder and access roads, on storage depots and marketing facilities, and on rural electrification and related infrastructure. These capacity building activities are to be complemented by measures providing direct incentives and serving in other ways to stimulate private savings and initiative. Such interventions include expanded procurement efforts to sustain declared increases in support prices, and increases in the ration price and an induced shift in urban purchases away from the Public Food Distribution Scheme to open market expenditures. Other initiatives involve privatization of input distribution, for example, by reducing subsidies and removing price, quantity, and geographic restrictions on retail fertilizer sales (Tarrant, 1982). As seen in the MTFPP, infrastructure improvements and market interventions will stimulate cultivator demand for low-lift pumps, tubewells, and for fertilizers, high yielding seeds, and pesticides. These investments are expected to initiate a virtuous cycle of farm level capital formation, increased output and employment, and reinvestment with impacts on non-farm rural activities and in the economy as a whole. The MTFPP aims at doubling acreage (from 3.6 million acres in 1980 to 7.2 million in 1985) under irrigation and increasing foodgrain production from a benchmark level of 13.5 million tons of foodgrain in 1980 to 20 million tons by 1985; employment in crop production is expected to grow by 16 percent in the plan period with two million new jobs being added and additional work (not estimated) being generated in processing and marketing activities. Attainment of these targets would represent a significant achievement in a setting where trends in per capita consumption and in unemployment and underemployment have been unfavorable (see above, section I).

The MTFPP promises to have a major impact on the broad context and specifically on the environment of risk in which fertility behavior occurs. Indeed, one of the principal objectives of this investment program is to reduce

dependence on weather in agriculture and to diminish vulnerability to crop failure because of flood, drought, or other climatological or agronomic events. Protection against natural calamity is to be provided through completion of major irrigation undertakings such as the Barisal, Karnafuli, and Pabna projects, through the installation of electrification facilities, and through investment in small scale drainage-cum-irrigation works affording greater cultivator control over water supplies. (Modern inputs such as pesticides and herbicides clearly have risk-diminishing functions as well.) The MTFPP also aims at protecting farmers against economic risk. Important program elements in this respect are price setting and procurement efforts and measures facilitating delivery of inputs and marketing of output.

While seeking to directly reduce the likelihood of various threats to rural well-being the MTFPP also has the potential of strengthening household capacity to withstand economic losses and to adjust to inevitable fluctuations in weather and in market conditions. An augmented ability to "self-insure" and to manage risk can be anticipated as a consequence of higher prices at farmgate and sustained increases in output and employment. Production increases are expected as a result of higher cropping intensities achieved by expanding area cultivated during the dry (boro) season and by improving drainage and flood control during the amon season. Output gains are also anticipated from the higher yields associated with irrigated cultivation. Yield increases should follow in addition from the switchover, especially in boro crops, to high yielding varieties of rice and the accompanying package of inputs and practices and from further adoption of hybrid varieties of wheat. More extensive government crop procurement efforts, at guaranteed prices, coupled with improved processing and marketing facilities would enable production gains to be translated into higher incomes for cultivators, farm workers, and those

working in activities with close linkages to agriculture. A significant proportion of these initial income increases would likely go to meet household consumption needs. However, if sustained over several years, output and income gains would surely be channeled into larger savings, and transformed into assets providing enlarged productive capacity and enhanced security for households. Protective investments might include farm level improvements in drainage and irrigation capacity, in storage facilities, and so forth, purchase of land and livestock, participation in non-farm economic ventures, and, institutional conditions permitting, accumulation of financial assets. As a by-product of such changes in household asset holdings, the insurance role that children have fulfilled could well be reduced or eliminated.

Actual implementation of the MTFPP has fallen behind schedule, and there seems to be little chance that irrigation structures and so forth will be in place and that output and employment gains will be attained in the predicted sequence and pattern (World Bank, 1982). Accordingly, there is little hope that the MTFPP -- through its impact on weather and market uncertainty, on household ability to self-insure, and derivatively on children's value as protective assets -- can significantly alter features of the setting which seem to account for persistent high fertility. Delays, unexpected outcomes, and differential impacts may be traced to the novelty, complexity, and unpredictability of the technologies and market policies being introduced through the MTFPP. Consider, for instance, the provision of assured and controlled water supplies (Stepanek, 1979). Major irrigation-flood control-drainage schemes typically involve lengthy construction periods (due to the need to survey terrain, import equipment, excavate huge channels and so forth) as well as further delays due to start-up problems associated with operating large scale and sophisticated engineering systems in volatile and untested

hydrological settings. Minor irrigation works, which are favored for their lower gestation periods, introduce their own problems of engineering design, appropriate scale and technical efficiency.

Difficulties also arise in regard to the use of irrigation water once structures assuring adequate and controlled supplies are in place (de Vylder and Asplund, 1979). Adoption of irrigated cultivation and shifts to higher cropping intensities require development of new skills and entail significant adjustments in the nature and phasing of farm operations and market activities and in the management of household land and labor resources. In a like fashion, efficient exploitation of the new agricultural technology can be slowed by cultivator unfamiliarity with recommended practices, such as appropriate time specific dosages of inputs, and cultural techniques. Because of these complications the MTFPP is likely to have a differential impact, yielding benefits initially to farmers who are already knowledgeable or who can afford, because of asset endowments and scale advantages, to bear the substantial risks involved in experimenting with new inputs and techniques. These market-oriented farm operators will benefit from price supports and expanded procurement efforts (but not from proposed cuts in input subsidies); some of the benefits that accrue to these households will flow in turn to wage laborers who will necessarily provide much of the work force for intensified cropping on larger holdings (Tarrant, 1982). On the other hand, small farmers with their acute vulnerability because of low reserves of food and cash to crop failure, debt, and forced sale of assets, have a more limited ability to finance a period of familiarization with the new techniques. The more venturesome smallholders who do adopt may benefit from the market policy introduced in the MTFPP (if they have effective access to approved grain dealers and to procurement centers). However, higher market prices for food

work on balance to the detriment of small farmers (and landless laborers) who as a group purchase a major portion of their consumption needs.

The upshot of this discussion is that the MTFPP will very likely have a delayed and uneven effect on the environment of risk in rural Bangladesh. Gestation lags and system start-up problems will limit the impact of the agricultural investment program on the severity of natural calamities and market dislocations. Unequal capacities within the population to bear the costs and risks of adopting the new technology figure to slow development of cultivator capacity to insure against various economic hazards. Larger farmers are likely to gain a measure of economic security from the MTFPP program; it remains to be investigated whether the security afforded these rural households is sufficient to encourage interest in contraception. Small farmers and landless laborers are likely to enjoy at best minimal income and employment benefits from MTFPP investments in the forseeable future. These households will remain, in the absence of other government programs, highly susceptible to the class of natural and economic risks against which, as argued in section I, children represent a versatile and attractive form of insurance.

(iv) Cooperatives

In Bangladesh, the standard response to the differential consequences of agricultural growth has been to shore up village institutional structure by establishing multifunctional cooperatives along the lines of arrangements tested in Comilla Kotwali Thana in the early 1960s. When this pilot effort demonstrated favorable results, the project was replicated in a modified form as the Integrated Rural Development Program (IRDP). By 1980 IRDP cooperatives were operating in 267 out of 415 thanas (Huq, 1981).

The Comilla model comprised village primary cooperatives (Krishi Samabaya Samiti, or KSS) linked into a thana-wide federation, the Thana Central Cooperative Association (TCCA). Village level units, which were established for the benefit of farmers owning five acres or less, served as means through which government-supplied credits, inputs, and extension services could be delivered to cultivators. TCCA staff supported the production objective set for cooperatives by facilitating flows of credit and inputs, and by organizing training sessions for KSS members and provision of expert advice. In addition, state-funded thana-based irrigation and rural works programs made available tubewells and lowlift pumps on subsidized terms and undertook infrastructural investments.

Cooperatives were also endowed with significant insurance functions, serving in the view of Akhter Hamid Khan who initiated the Comilla experiment to protect peasant proprietors against natural disaster, market fluctuations, and the exploitative demands of money lenders, landlords, and the like (A. H. Khan, 1974). Cooperatives were seen as fulfilling this protective role by enabling cultivators to bargain for improved terms in factor and output markets, to mobilize available labor resources, to accumulate capital and to jointly undertake and manage investment and social welfare projects, to enforce a collective discipline, and in general, to instill a sense of solidarity and interdependence among members.

As a set of arrangements designed with protective objectives in mind, the Comilla system of cooperatives holds special interest from the perspective of the approach to fertility sketched earlier in this report. Cooperatives were expected to significantly increase productivity, thereby augmenting capacity to self-insure and possibly circumscribing the insurance functions which are now apparently assigned to children. A favorable effect on the environment of

risk and on fertility behavior could also be expected for the intended goal of cooperatives of shielding and supporting members in the face of natural and social hazards. In this respect, the risk diminishing and risk diffusing activities suggested by A. H. Khan include drainage and irrigation improvements, construction of storage facilities, group action to break local monopolies and to obtain better terms in markets for credit, land, and inputs, and finally joint savings and lending practices in which the risks of default are assumed by the cooperative as a whole. Cooperatives also provide a framework through which insurance facilities and guarantees of economic security can be organized and administered. Such arrangements could involve cooperative planting, harvesting, and so forth for households experiencing adversity; repayment of loans by the collective body in the case of unavoidable cultivator default; reliance on provident funds or credit sources controlled by the cooperative; investments, mediated through cooperative financial undertakings, in urban-based capital markets and in private insurance plans; and access, through cooperative administrative auspices and guarantees of individual premium payments, to government-operated crop, livestock, all purpose income-maintenance, and old age insurance schemes. These or related security guarantees, which are attractive as means of providing substitutes for the protective functions of children, have been tested in countries such as Sri Lanka and the Philippines, and could, in principle, be included among the core responsibilities and activities of the Comilla-style cooperatives.

The multi-purpose cooperatives tested in Comilla district and subsequently introduced on a wider basis have brought in their wake productivity increases and output gains of varying extent. Results have been most impressive in Comilla Kotwali Thana where the cooperatives program was initiated and where, critics suggest, modern inputs, credits, and extension services were made

available on a lavish scale and on highly subsidized terms (A. R. Khan, 1979; Asplund, 1979; Blair, 1978). Production effects have been less dramatic in the IRDP thanas in which a modified version of the Comilla style system was introduced in the 1972-80 period (Asplund, 1979).

Far less encouraging has been the performance of multipurpose cooperatives as means of protecting and improving the economic position of small farmers. In the Comilla districts, cooperatives were successful, at least initially, in attracting a significant proportion of smallholders and encouraging adoption of modern inputs and techniques (Asplund, 1979; A. R. Khan, 1979). By the mid-1970s, however, large farmers had increased their representation in these institutions, and had succeeded in gaining access to credits and inputs originally reserved for small holders. Small holder participation in the Comilla cooperatives fell sharply, while those small farmers who remained members achieved lower rates of increase in yields and in per capita income. Despite its objectives, the Comilla scheme failed to protect small farmers from loss of land and was unable to slow the rate of increase in the number of landless wage laborers, a group for which the Comilla scheme offered only limited benefits.

As regards the IRDP cooperatives, rapid replication has denied these units resources of the scale and quality made available in Comilla. Comilla style units have now been introduced in 267 thanas, although only a small proportion -- approximately ten percent -- of eligible households have joined, with individual societies having, on average, only thirty members. Total membership is now 1.3 million representing a modest proportion of all farm households in Bangladesh. Largely on account of the unavailability of administrative and financial resources, IRDP cooperatives have given lower priority, as compared to the original Comilla pilot project, to activities such as training, bulk

input purchasing and produce marketing, which are of special significance to small holders. The IRDP approach has also relied more heavily than in Comilla on targets set in Dacca, on administrative guidelines, and on standardized procedures in such crucial matters as determining eligibility for credit, for example, for irrigation equipment and performance in repaying loans. Such organizational modifications were resorted to as a means of preserving program integrity and reaching intended small farmer beneficiaries during a period of rapid expansion and in the absence of seasoned and dedicated field and supervisory personnel. Bureaucratization, which is reflected in the emergence of a hierarchical IRDP "department" structure based in Dacca and in the diversion of resources to construct office buildings in thana centers and to acquire vehicles for IRDP officials, has however not prevented larger farmers from achieving a dominant position in the operation of village level units and from enjoying a major share of the benefits made available.

In short, cooperatives appear promising, at least in principle, as an organizational device for protecting and insuring small farmers against weather and market-based risks and providing guarantees that could substitute for children in their capacity as security assets. Realization of the protective objectives set for cooperatives has been hampered in Bangladesh by a lack of financial resources, and perhaps more acutely, by a shortage of trained, resourceful field agents needed to take on the multiple, open-ended and drawn out tasks involved in building and preserving cooperative structures. The aim of eventually developing cooperatives to fulfill productive and protective functions remains important for Bangladesh. In the short run, however, cooperatives do not represent a feasible and sustainable means through which to provide protection to smallholders, yet alone to the landless who derive only

indirect benefits from these institutions. It seems inevitable that the government will look to other policies and interventions as ways of meeting the security needs of the population.

(v) Rural Public Employment

The difficulties encountered by IRDP have elicited various reactions from the Government of Bangladesh and from participating donor agencies. One response has been to increase the level and quality of resources made available and to correct design flaws attributed to IRDP cooperatives. For example, the Bangladesh government and the World Bank have jointly planned and financed a project, designated RD-1, which is being implemented through the IRDP framework in seven thanas (Wood, 1980). RD-1 has intensified the flow of physical inputs and credits to Comilla-type cooperatives in the affected areas and has strengthened the technical services and improved management; the project is scheduled to be extended to 29 additional thanas in the next four years. Analogous efforts, undertaken with the same broad aim of testing what could eventually become replicable models of support and service delivery to small farmer groups, have been initiated in eleven other thanas with support from the Asian Development Bank, the Danish government, and the Dutch government.

While these small scale and resource- and time-consuming experiments are continuing, the government is exploring alternative means of shielding and supporting small farmers and generating employment. Such highly focused, separately administered measures include the Rural Finance Experimental Project and other models of credit distribution, the Training and Visit approach to providing extension services, introduction of a New Marketing System to widen access to fertilizer supply points, public employment schemes and other direct interventions to aid the rural poor.

Of the specialized responses to rural problems that are being investigated, employment-creating public work schemes offer potential advantages and opportunities as means of providing flexible and broad based protection against various contingencies. As noted above, the employment program that has been in place in rural Maharashtra since the mid 1970s has served as an effective safety net and probably accounts for the limited recourse by farmers in that Indian state to distress sales of land and livestock. Employment generating rural works schemes have operated elsewhere in India and in other countries as well. In Bangladesh, the history of large scale job-creating efforts begins with the Rural Works Program (RWP) which was tested in Comilla district in 1961 and then implemented throughout what was then East Pakistan. The RWP was funded through sales of surplus American wheat and administered at the thana level. A development committee made up of the thana circle officer, rural works supervisors and overseers and other civil servants, was responsible for preparing an overall thana investment plan, reviewing projects drawn up and submitted by elected union council representatives, allocating funds disbursed by the central government and assisting local project implementation committees in executing sanctioned projects (Asplund, 1979).

The RWP achieved greatest success between 1962 and 1967 when the scheme generated an annual average of 30.8 million man-days (123,152 man-years) of employment at an estimated cost of $0.97 per man-day (Thomas, 1971). The program which accounted for up to nine percent of the total development budget, made possible the construction of thousands of roads, embankments, and canals, and hundreds of bridges and buildings. The fall of Ayub Khan, a strong backer and would-be beneficiary of RWP, brought a decline in the resources allocated to the program; thana plan books, design criteria, and

execution procedures were neglected while observers noticed a deterioration in the entire system of decentralized planning with thana-based technical and administrative support. After Independence there were further cutbacks in funds and in program discipline and effectiveness. RWP received less than three percent of the development budget in the 1970s and created less than 50,000 jobs per year (Asplund, 1979). Currently, a revival of RWP, first proposed in the First Five Year Plan and reiterated in the Two Year Plan (1978-80) and in the Second Five Year Plan, is being attempted through two pilot schemes, the Special Rural Works Program undertaken with ILO-Swiss assistance and the Intensive Rural Works Program being executed with Swedish funding. These experimental efforts are aimed at enhancing the managerial and technical capacities, at headquarters and in the field, of the Ministry of Local Government, Rural Development and Cooperatives which administers RWP, and sharpening the impact of the scheme on specific target groups.

Alongside of these attempts to resurrect RWP, Bangladesh has since 1974 been operating a Food for Work (FFW) program. Indeed, FFW, which began as a relief measure in the wake of the 1974 flood and continues to be coordinated by relief and rehabilitation officials in the Ministry of Food has become the dominant public employment generating activity in the country. In FFW projects, wheat supplied by the U.S.A. under Public Law 480 (title II), by the World Food Program and by other donors on a lesser scale is distributed as wages to laborers employed (as in the RWP) in the dry months between December and May. World Food Program resources are largely applied to major water, power, drainage, and flood control schemes through the administration and coordination of the Water Development Board which works through project implementation committees. Wheat supplied by AID and made available to the government through CARE is channeled through the Relief and Rehabilitation

Division of the Ministry of Food and applied to small scale, locally generated projects. Project initiatives drawn up at the union or ward level or by thana officials such as the Project Implementation Officer are submitted to relevant thana, subdivision, district and central government authorities; approved projects are executed by FFW project committees at different administrative levels. CARE personnel are involved in surveying, designing, selecting, approving, implementing, and monitoring local initiative FFW projects (USAID, 1979).

FFW began on a small scale with a distribution of 32,000 metric tons of wheat in 1974/5. The allotment increased in the next year to 209,000 tons and grew to 263,000 metric tons in 1977/8 (USAID, 1979). Since then the program has been allocated approximately 300,000 metric tons of grain annually. These resources have been used to create assets on an impressive scale. The achievements of FFW include excavation of hundreds of tanks and over fifteen thousand miles of canals, embankments, and drainage channels, construction of miles of roads as well as numerous bridges. Substantial employment has been created through these diverse and numerous projects. Assuming an annual total of 300,000 metric tons some 107.5 million man-days of labor can be reimbursed at the official wage rate of three seers per day. Total person days would amount to 80 million if a figure of four seers per day, reflecting possible losses and leakages of program resources, was used in the calculation. If a full year of work is taken (generously) to comprise 250 man-days, then FFW is currently generating between 320,000 and 430,000 man-years of employment on an annual basis (based on USAID, 1979). These totals may appear relatively modest when compared to an estimated increment of the rural labor force of 400,000-500,000 workers annually (Clay and Khan, 1977). A much broader impact is revealed, however, if we recall the part-time nature of work on FFW; if we

assume that each participant works 30 days then an estimated 2.7 million to 3.6 million laborers are benefiting each year. If each of these workers represented a different household about one-seventh of all families would be affected. If the RWP and other, smaller programs operated by private voluntary organizations are taken into account these figures would be significantly higher.

In short, FFW has been successful in reaching and mobilizing a relatively large fraction of the rural labor force and spreading employment benefits widely. However, despite the scale of program impact, assessed in employment terms and in relation to the number of projects undertaken, the opportunities inherent in Food For Work and related activities as means of creating jobs and wealth, and providing a broad-gauged form of insurance are not being satisfactorily exploited. Some recent appraisals of FFW have raised questions about program priorities and objectives and about the way in which the scheme has been administered (USAID, 1981; Brundin, 1979; Institute of Nutrition and Food Science, 1981). For example, a thorough USAID review of FFW policies and procedures suggests that the program has overemphasized relief and employment creation concerns and neglected essential long term production objectives. The USAID audit report finds that actual implementation of FFW has been hampered by such chronic problems as breakdowns and bottlenecks in communications, transportation, storage, and distribution of grain arising out of the excessive number and wide geographic coverage of projects, and leading to acute shortages and delays in paying workers and in starting and completing projects; poor control and monitoring of grain flows resulting in underpayments of wages and extensive misuse and misappropriation of commodities; lack of thana level planning, reliance on implementation by officials who have insufficient technical education and limited time and

financial resources, and derivatively, inadequate technical supervision of project design and execution. These problems have prevented FFW from further expanding its already considerable job creating efforts. Indeed, one assessment suggests that FFW at current staffing could reach roughly twice as many beneficiaries by effecting changes in program planning and execution that appear feasible and practicable (Brundin, 1979).

Changes in program organization and implementation could also serve to regularize and intensify linkages between FFW and present and future beneficiaries. The delays, wage underpayments and commissions claimed by "employment" agents, high travel costs, disputes and slack administrative practices that characterize current operations all work to reduce the significance of FFW in the calculations and expectations of the rural population (Marum, 1981). Accordingly, we doubt that FFW, as presently implemented, has significantly improved the environment of risk in rural Bangladesh and we see little likelihood that the program has had any perceptible impact on fertility.

The existence of problems in implementing FFW is hardly surprising given the program's origins as a relief effort, its subsequent very rapid expansion, and the patchwork administrative structure that has evolved. These flaws are remediable and it is heartening that the government and interested donor agencies are exploring ways of measuring the productive impact of FFW projects and alleviating organizational shortcomings. One interesting proposal involves assigning USAID-supplied, CARE administered food resources to a new Food for Development scheme. This initiative would involve RWP staff and infrastructure and would effectively constitute an experimental and initially small scale amalgamation of RWP and FFW. We have already mentioned ongoing donor-financed efforts to resuscitate and reshape RWP. An enlarged and

greatly strengthened public employment program could emerge in Bangladesh if the pilot Intensive and Rural Works Programs are successfully completed and if FFW resources can be applied and fully exploited.

(vi) Towards a Policy of Guaranteed Public Employment

This process of revamping and redesigning Bangladesh's rural employment policies, which hopefully will gain momentum in the coming months, offers a rare opportunity of creating a rural works-cum-insurance scheme with significant antinatalist implications. As argued earlier, continuing high fertility represents an adjustment to an environment of pervasive risk in Bangladesh; the economic rationale for large family sizes can be addressed through government policies which provide substitutes for children in their role as all-purpose security assets. Employment schemes can assume such a role by offering work when individuals experience unexpected declines in income. To attain the desired demographic impact such programs must operate in a timely and consistent fashion and must be available to broad segments of the population; such schemes need to be rigorously administered, securely financed, and carefully coordinated with other development measures and with the delivery of family planning services.

No attempt will be made here to suggest a detailed design and organizational structure for an employment-insurance scheme in the Bangladesh context. Still, information on employment generating programs in other settings may be of value to those involved in rethinking and reshaping current job creating activities in the country. In the following paragraphs, we describe a public works scheme which, as noted above, has functioned as an effective safety net in the Indian state of Maharashtra. We then discuss

issues likely to emerge when (and if) an employment-insurance scheme is tested in Bangladesh conditions.

Since 1974 the government of Maharashtra has operated an employment creating scheme that fulfills a public commitment, articulated in resolutions of the legislative assembly and codified as a state law, to provide work to all job-seeking adults residing in rural areas. This Employment Guarantee Scheme (EGS) was preceded (and foreshadowed) in the 1960s and early 1970s by pilot projects and state-wide programs aimed at providing gainful employment, creating productive assets, and alleviating rural poverty. The impetus to such measures lay in the high frequency of drought and famine in Maharashtra's technologically backward and demographically saturated rural sector. The economy of Maharashtra is highly dualistic; rural areas outside of the relatively prosperous enclaves of Bombay and environs are subsistence-oriented and dependent on rain-fed agriculture carried out in small fragmented holdings on marginal, ecologically degraded lands. EGS was officially launched in 1972 as a key component of a fifteen-point state program to alleviate the worst features of rural poverty and to build a new economic base. The large relief operations carried out in the wake of the severe 1973-74 drought delayed implementation of EGS; the scheme began operation on a modest scale in 1974/5 and then expanded rapidly.

The statutory guarantee of employment in Maharashtra is operationalized through distinctive administrative and revenue raising arrangements. Beneficiaries, defined as unskilled and jobless persons registered with a village panchayat in rural areas, who are prepared to do manual labor, have no choice over the type or location (within the district) of work provided but are assured of receiving employment within fifteen days of presenting their job application (Reynolds and Sundar, 1977). Wages are paid on a piece rate

basis calculated so that seven hours of work yields the minimum agricultural wage of three Rupees. At the state level, the Secretary of the Planning Department is the responsible officer and the individual charged with making financial disbursements, integrating EGS activities into state and district plans, and coordinating works projects with the programs of other departments such as irrigation, soil conservation, and power. In the field, authority and responsibility lie primarily with the district collector. This official, with the assistance of a deputy collector for EGS, superintending engineers, block development officers and various skilled and clerical workers, supervises the registration by secretaries of village panchayats of eligible jobseekers, and oversees preparation, in conjunction with local committees, of detailed blueprints and plans of action for production work that could be taken up in EGS. The collector also sanctions and allocates work to state departments which typically serve as executing agencies. Finally, the district collector audits and monitors the implementation of individual projects.

Expenditures on EGS have risen from 137 million Rupees in 1974/5 and 515 million Rupees in 1977/8 to annual figures of over one billion Rupees in 1979/80 and 1980/81 (MHJ, 1982). The EGS share of planned state expenditures grew from five percent in 1974/5 to over fifteen percent in the late 1970s. The financial resources needed to implement the state's employment guarantee derive in roughly equal measure from special taxes and from the regular state budget (including funds received from the central government in Delhi). The revenues earmarked for support of EGS in 1974 legislation include 1) taxes on professional and other salaried or earned income, 2) a surcharge on the state automobile tax, 3) a surcharge on the state sales tax, 4) a special irrigation assessment, 5) a special land revenue assessment, and 6) a surcharge on non-residential urban lands and building taxes. Returns from the levy on

professional, salaried, and earned incomes have risen over three fold since 1975 and provide the bulk of the funds raised specially for EGS. The land and water surcharges are not very productive as cultivators in Maharashtra as elsewhere in the Indian subcontinent remain relatively free of taxes (MHJ, 1982).

The increased resources allocated to EGS have financed sustained growth in the employment provided through the program. The number of man-days generated by EGS has increased from 4.8 million (192,000 man-years) in 1974/5, to 16.0 milion (640,000 man years) in 1978/9, 205 million (820,000 man years) in 1979/80, and 220 million (880,000 man years) in 1980/81 (Bahadur, 1982; Abraham, 1980). EGS compares favorably with other programs in regard to costs of creating work. Costs per man-day of employment created in EGS have varied between four and five Rupees a day ($0.45 - $0.55) over the last seven years. These figures are similar to expenses incurred in operating other works programs in India, but are significantly less than the estimated costs of the RWP (see above) as well as programs implemented elsewhere.

EGS remains a novel and controversial venture. The operational arrangements, physical achievements and distributional consequences of the program have been closely scrutinized. Evaluation studies have pointed to problems in EGS ranging from delays in completing works and compensating laborers and excessive spending on soil conservation works and roads of marginal value, to inadequate provision for the care of the children of the large number of female workers and underdeveloped linkages with various social welfare programs. Yet these program reviews also reveal a capacity to overcome difficulties, while confirming that EGS has yielded employment, income, and productive benefits of unprecendented magnitude. Available information, including evidence from special surveys of EGS beneficiaries,

suggests that the scheme has significantly altered the social and economic environment in rural Maharashtra. For example, productive assets such as minor irrigation tanks, terraces, and barriers against erosion constructed under the aegis of EGS have reduced the incidence of drought and made Maharashtra's agriculture more resilient, productive, and labor intensive. Earnings from EGS have helped participants to repay loans (and to avoid distress sales of land) and to acquire new productive, household, and financial assets. Evidence on the impact of EGS on fertility is less direct: however, it is notable that Maharashtra has one of the lowest fertility rates among the Indian states. Moreover, there are clear indications that fertility has declined in Maharashtra in recent years (Cain, 1981).

There is no warrant for assuming that EGS can be readily transferred to Bangladesh or even that the replication of the Maharashtra scheme would be desirable. Indeed, whatever form an employment-insurance scheme takes in Bangladesh it will surely have a "home grown" quality with organizational arrangements that reflect and respond to local conditions and constraints. Still our review of EGS experience discloses certain findings of general interest and suggests issues likely to arise in designing an employment program in Bangladesh with economic as well as demographic objectives.

One lesson of EGS is that it is essential to try out different approaches to employment creation on a small scale before proceeding with a full-fledged program. In Bangladesh, RWP and FFW were each tested in brief experimental phases. These programs were quickly expanded into large scale efforts by governments trying to alleviate the distress caused by serious floods in 1962 and 1974. Significantly, the government of Maharashtra delayed introducing EGS on a state-wide basis and resorted to traditional relief measures when faced with a natural disaster (1973 drought) of similar magnitude. The

coverage of EGS increased steadily in its first half decade of existence but grew at a more moderate pace than the expansion of RWP and FFW. EGS has continued to expand in size and impact. Both RWP and FFW encountered significant (and similar) operational difficulties that led in the case of RWP to rapid deterioration in program performance. As noted above, the bottlenecks, delays, misappropriation of funds and so forth observed in the implementation of FFW have prompted a rethinking of the role and scope of that program. In 1983, some FFW resources will be used to support an experimental Food for Development Project. FFW could also provide the wherewithal to test variants of an employment-insurance scheme in Bangladesh. Additional resources for such pilot undertakings could be funded by cash generated through sales of wheat made available under Title III of PL 480. Of course the use of grain supplies for this purpose would have to be coordinated with such other objectives of the Title III program as maintaining cereal prices and disbursing funds to support approved irrigation and fertilizer projects.

Small scale investigations of employment insurance schemes could be used to explore alternative administrative arrangements. Pilot projects are needed to identify critical functions and procedures and to assist in allocating responsibility for various tasks and phases of an employment scheme. The present status of RWP and FFW indicates that much remains to be sorted out in the management of public employment programs in Bangladesh. RWP and the much larger FFW are being implemented concurrently (but not in a coordinated fashion) and are impeded by similar problems and constraints. FFW is administered and implemented by project officers working with part-time local committees; these groups which are constituted on an ad hoc basis are typically made up of local, well-to-do farmers (or the nominees of such farmers). Standing project committees with local union councils remain the

primary implementing mechanism in RWP (including the Intensive and Special Rural Works Programs). Evaluations continue to find that committee members are unqualified and uninformed while the committees themselves fail to meet regularly or to function effectively (Swedish Embassy, 1981).

The administrative shortcomings observed in RWP and FFW are a consequence in large part of a premature devolution of planning, decisionmaking, and implementation authority to various non-governmental bodies. Decentralization offers opportunities of engendering participation, mobilizing previously untapped local energies and resources and shifting monitoring, supervision, maintenance, and other essential tasks to those near to the scene of action. However, these potential advantages may not emerge immediately if rural communities are disorganized and conflict-ridden. In such situations, the decentralized works program functions in effect as a means of shoring up local organizational capacity and strengthening the position of poorer groups. The desired results of devolving planning and administration are also unlikely to materialize if local elites succeed in distorting program objectives and claim an undue share of program benefits for themselves. Many of the operational problems experienced in RWP can be traced to an over-reliance on union chairmen and other local notables who lack the time, skills, and incentives to participate effectively in administration. (On the other hand, attempts in the Special and Integrated Rural Works Programs to reach and organize target groups add to the already formidable administrative tasks of running an employment program.) Similar attempts to involve or placate influential farmers or to direct projects at specific beneficiaries have created unnecessary organizational difficulties for FFW.

In contrast to RWP and FFW, the devolution of authority and responsibility in EGS has proceeded in relatively deliberate phases. The

program has been bureaucratically decentralized from the beginning, with district collectors playing a crucial operational role. The collector has retained discretionary control and authority over virtually the entire project; elected local officials (and other individuals) are involved in the administration of EGS through performance of specific tasks (maintaining registers of jobseekers) and by serving in advisory positions. The lesson we would derive from EGS experience in this respect is that there are advantages in concentrating responsibility and decisionmaking powers in the early stages of project development when the very shape and ultimate impact of the venture on prospective beneficiaries remains in doubt. The objective of eliciting local participation, particularly from poorer segments of the community, can be pursued once these groups have begun to derive significant employment, income, and insurance advantages from the job creating scheme.

Pilot schemes also offer opportunities to assess possible costs (and the ultimate size) of employment insurance programs and to examine alternative revenue sources and various development implications of such policies. In addressing these issues it is important to remember that employment schemes represent one component of a larger development program aimed at expanding incomes (and enlarging the tax base) and generating employment (lessening the need for job creating schemes). In Bangladesh the major development initiative is detailed in the MTFFP; this program aims essentially at increasing cropping intensities (by expanding the coverage of irrigation) and augmenting yields on cropped land. Recent economic difficulties in Bangladesh as well as problems specific to the program have delayed implementation of the MTFPP. However, agricultural growth and employment prospects under this scheme remain good in the near term if not in the immediate future. Indeed most commentators expect that the various measures subsumed in the MTFPP will

eventually generate employment at rates exceeding the growth of the agricultural labor force (A.R. Khan, 1979).

In the short run, however, the employment problem in Bangladesh will as noted earlier likely worsen, making it all the more important that the government establish a workable employment-insurance scheme. The size of the market for a guaranteed employment scheme in Bangladesh can only be assessed in approximate terms. One illustrative analysis begins with an estimated ten million unemployed and underemployed in agriculture in 1981 and calculates that a program employing fifty percent (five million) of available surplus labor would result in a scheme approximately twelve times larger and more expensive than current RWP and FFW activities combined (Asplund, 1979). Brundin produces more refined estimates (ranging between 2.7 million and 4.7 million participants) of the potential demand for employment in such schemes by including only males aged fourteen to sixty-four from households operating less than one acre of land.

Judging from EGS experience these figures are far in excess of the actual number of individuals who would participate in an employment-insurance scheme. Thus, results from the Indian National Sample Survey suggest that only fifteen to twenty-five percent of the estimated pool of underutilized labor in Maharashtra have participated in EGS (Dandekar and Sathe, 1980). For Bangladesh, this would imply that a guaranteed employment scheme would have to generate two to three million man-years of work annually, amounting to a three to five fold expansion of present job creating activities. The seemingly low turnout in Maharashtra can be attributed to the design of EGS, not as a blanket relief effort, but as a supplementary employment insurance scheme paying guaranteed but below-market wages and offering assured but relatively unattractive work opportunities. It would be worthwhile for pilot schemes in

Bangladesh to attempt to duplicate this feat of assuring the availability of employment but at wage rates and in working conditions such that the guarantee is invoked only in extreme circumstances.

An employment program three to five times larger than the present level of activity would have to be funded in large part from domestic sources. It goes beyond the scope of this report to delve into Bangladesh's public finances. However, we would call attention to a recent analysis by the World Bank (1982) which suggests that there are many unexploited opportunities for resource mobilization. These opportunities include assessing or raising taxes in various areas and eliminating a wide range of subsidies. Considerations should also be given to the possibility of diverting development expenditures from certain areas of current emphases to support of an employment insurance scheme.

Conclusion

The premise of this report, a premise shared by the cosponsors of the report -- the Planning Commission of the Government of Bangladesh and USAID, is that in order for a timely fertility transition in Bangladesh to occur, the desire for smaller families, and a matching demand for the means of fertility reduction, must be stimulated and sustained through public policy measures. We recognize the enduring importance of a vigorous family planning program and other social welfare programs, and, indeed, the recommendations that we put forward are based on the assumption that such programs will continue to operate and improve in the future. Our task was to review government development policy more broadly (and the overall progam of USAID in Bangladesh), and, as far as possible, indicate which development measures outside of the provision of family planning information and services hold the promise, either currently or potentially, of significantly altering the demand for contraceptives.

Our strategy was, first, to develop a framework for policy analysis appropriate for the Bangladesh context. This involved a critical review of the fertility determinants literature in general, and in the specific case of Bangladesh. We considered and rejected conventional approaches (section I (ii)), in favor of an institutional framework (section I (iii)). The analysis identified the extraordinarily harsh environment of risk, and the absence of effective forms of risk insurance, as central to understanding the persistence of high fertility in Bangladesh (sections I (iv), (v), (vi), and (vii)). The analysis yielded a strong policy conclusion: that a necessary condition for fertility transition in Bangladesh consists in eliminating, or substantially reducing, the positive reproductive incentive associated with children as

insurance against risk. This conclusion informed our assessment of the fertility impacts of development policy: policies with the greatest potential impact on reproductive behavior would either significantly alter the environment of risk or introduce effective alternative means of adjusting to risk.

Among the elements of the development program set out in the Second Five Year Plan -- including the Medium Term Foodgrain Production Plan, the Integrated Rural Development Program, and initiatives specifically designated as "beyond family planning" measures -- rural public employment measures were found to hold the greatest potential for substantial fertility impacts. Current rural public employment initiatives such as RWP and FFW have not had a significant fertility impact owing to a variety of program limitations (section II (v)). Nevertheless, these efforts constitute a basis for developing what would amount to a policy of guaranteed public employment in Bangladesh. Because of its potential flexibility and broad base, and its successful implementation in other parts of South Asia (Maharashtra State in India, in particular), a policy of guaranteed public-works employment, we suggest, offers the most attractive means of providing insurance against various contingencies in rural Bangladesh. Formidable problems in moving towards this goal exist, and several specific recommendations, including an initial small scale pilot approach, are offered in section II (vi).

The Population Section of the Planning Commission could be instrumental, we feel, in redefining the population sector in broader terms and in scrutinizing the large non-family planning development budget for possible fertility effects (relying on the risk framework described earlier in the paper). The Population Section could also serve as an influential advocate, within the Planning Commission, of a policy of guaranteed rural employment.

These Population Section roles and activities could be accomplished, in part, by holding regular briefings and seminars for officials at various levels in the Planning Commission hierarchy and by sponsoring research on the demographic ramifications of rural employment programs.

We reviewed the entire USAID program in Bangladesh in the course of our work, and looked thoroughly at the portfolio of ongoing and proposed projects. The following projects were reviewed and found to have little or no potential impact on fertility behavior in Bangladesh: Palli Chikitsak; Fertilizer Distribution Improvement; Rural Finance Experimental Project; Water Management Systems I and II; Zilla Roads Maintenance and Improvement; Farm Implements Production and Distribution; Agricultural Inputs Distribution and Marketing; Agricultural Research I and II; and Rural Industries I and II. We conclude, as detailed in sections II (v) and (vi), that with respect to fertility impacts, FFW (Title II) and PL 480 Title III (as a source of financing pilot employment schemes) have the greatest potential.

It is essential, we feel, that the population policy debate be broadened in recognition of the powerful linkages that exist between demographic phenomena and social and economic structure. The design and implementation of effective remedial policy depends on such a broadening, because it is only from an appreciation of the forces that combine to produce individual demographic outcomes that adequate public resources will be mobilized and appropriate policy measures identified. As in the case of the Population Section of the Planning Commission, USAID can have an important role in reorienting the common, narrow conception of the "population sector" in Bangladesh — through its dealings with the Government of Bangladesh and other donors, and the design of its program. In this regard, we note that the current sectoral program strategy of the USAID mission may be ill-suited for

this end, in as much as the "population sector" is explicitly segregated from those program and policy areas that promise the greatest leverage for fertility decline. An alternative strategy -- one adopted by the USAID mission in the Philippines, for example -- would focus on key policy goals, such as employment, and identify the several interacting program elements that further a particular goal. In Bangladesh, this strategy would be particularly apt, because, as is stressed in our analysis, employment represents a critical focal point, as both the most pressing problem associated with rapid population growth and the most promising means of introducing broad based insurance against risk, and thus of inducing significant fertility decline.

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