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SUMMARY VIEWS ON THE ECONOMICS OF FAMILY PLANNING IN BANGLADESH

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ABSTRACT

This paper summarizes our findings from a larger research project dealing with family planning in Bangladesh. We have organized our presentation around three questions.

Question I. Cost-Benefit Analysis: Are the past expenditures on family planning justified by their demographic and economic impact?

There was a large increase in contraceptive acceptance between 1981-82 and 1983-84. Our analysis suggests that this acceptance will be having an effect on population growth in Bangladesh for the next several years. If we multiply our estimate of the demographic impact (as measured in births prevented) by the value of a birth prevented, we get an estimate of the economic gains from family planning. Comparing this number with the estimated costs of family planning, we conclude that by any reasonable set of estimates, the economics of family planning in Bangladesh are very favorable. The economic benefits generated consistently exceed the costs.

Question II. Component Analysis: Are all of the various components of the program justified in terms of the benefits they generate? Are some of the elements in the program yielding a higher level of return than others?

We examine the economics of three components of the national family planning program: 1) the U.S.A.I.D.-funded NGO's, 2) the Social Marketing Program and 3) the rest of the program (which we call the "Residual"). Benefit cost ratios for each of the three program components are consistently positive. That is, in each case the benefits generated are larger than the costs. The three programs vary in terms of the cost per couple year of protection. Overall, the U.S.A.I.D.-funded NGO's have the lowest cost per CYP, the Residual program has the second, and the SMP is the most costly. When, however, these cost-effectiveness ratios are estimated separately for sterilization and other methods, the SMP is seen to have the lowest unit costs for methods other than sterilization.

Question III. Conclusions and Some Thoughts on the Relevance of These Findings for the Future: What are the implications of the empirical record for the future?

The data in this paper are incomplete in many respects, but they do suggest important conclusions about family planning programs in Bangladesh. The support that is given to family planning seems to be well justified by the demographic and economic impacts that it generates. It is easy to be pessimistic about the pervasive poverty in Bangladesh and the difficulties that are often encountered in the implementation of programs and conclude that nothing worthwhile is happening. While the data are far from perfect, they indicate that some important things are beginning to happen to contraceptive practice. We conclude that the economics of family planning are highly favorable, but that program effectiveness can be increased by continuing efforts to increase the output per unit of expenditure.

In sum, both the overall national program and the three components examined here are extremely worthwhile investments. While clinical methods of contraception (especially sterilization) are inherently more cost-effective than other methods, the program needs to offer a full range of methods, and the present mix of service delivery systems seems well geared to achieve both a high impact and a good balance in program services.

Population growth and its implications for development are a matter of major concern in Bangladesh, and both the government and donor agencies have committed themselves to an attempt to reduce the rate of growth. To this end, the quantum of resources for family planning programs has increased considerably. During 1983-84 we estimate that expenditures on family planning amounted to 126 crore Taka, or about $56.7 million. This amount represents nearly a doubling of the level of expenditure just two years previously. While the numbers are difficult to establish with great precision, this new and higher level of expenditure on family planning may involve as much as 3% of the government development budget. At this point it may be appropriate to examine the economics of investments in family planning in the Bangladeshi context.

The use of large quantities of resources for family planning raises a number of issues: 1) Have the historical expenditures on family planning been justified in terms of their demographic impact and indirect contribution to economic development objectives? 2) Are all of the various elements in the program justified in terms of the economic return which they generate? Are some yielding a higher level of return than others? 3) Does the empirical record, as viewed from an economic perspective, suggest any implications for the future? Should the overall level of effort be increased, decreased or remain the same?

I. Cost-benefit Analysis: Are the past expenditures on family planning justified by their demographic and economic impact?

Trends in fertility in Bangladesh are a matter of considerable controversy. There is no system of data collection that can provide national trends. Such data as are available suggest that fertility remains high although there may have been a modest decline during the past ten years. In the absence of reasonably complete data on fertility we are obliged to use indirect evidence to assess the impact of family planning programs, such as measuring contraceptive prevalence or examining family planning service statistics. The best available evidence for assessing relative performance of different program components is drawn from the family planning service statistics system. These statistics (Table 1) show a dramatic increase in the level of contraceptive distribution during the past several years.

Since contraceptive methods differ in their impact, it is important to weight the statistics relating to individual methods according to their expected demographic impact. A number of techniques for this purpose have been suggested in the literature. We will adopt the "birth prevented" as our measure of impact. A birth prevented is assumed to occur if enough contraceptive protection is offered to protect one couple for three and one half years.[1] Methods are measured against their

ability to offer protection. A sterilization generates 7.75 years of protection or 7.75/3.50 (or 2.21) births prevented. Under the conditions prevailing in Bangladesh, it is assumed that 1050 condoms (300 per year times 3.5 years) will be required to prevent one birth.[2] Table 2 shows the assumptions used in calculating demographic impact. We first calculate the number of couple years of protection (CYP's) associated with each method. These are then adjusted for the average interval between contraceptive use and demographic impact by discounting. Since sterilizations have a longer interval between adoption and impact than condoms or other non-clinical methods of contraception the "adjustment" to their numbers is greater. Adjusted CYP's are then aggregated and converted into adjusted "birth preventions". Table 3 shows the number of birth preventions associated with the contraceptive use patterns of Table 1. Adjusted birth preventions nearly doubled during the period, suggesting that there is a strong positive association between impact and expenditure.

A clarification of the term "birth prevented" and its demographic implications will facilitate the following discussion. A birth prevented is a permanent change in the number of births taking place which results from a deliberate intervention. A birth prevented changes the population of a country by reducing the number of births in the initial year and by permanently changing the size of that birth cohort (and

perhaps of its descendants) in all future years. This impact is shown in Figure 1. In the base year, an investment is made in family planning which reduces the number of births taking place in the following year by a certain number, assumed here for convenience to be 100,000. To simplify the discussion events are assumed to take place exactly at mid-year. In each year after the birth preventions take place, the new (and lower) population differs from the original or base (and higher) population by the number of people who would have survived from the original cohort of birth preventions.

Assessing economic impact involves the additional and more complicated step of measuring the economic value of preventing a birth, VBP. The value of a birth prevented has both political (or normative) and scientific elements. The normative or political elements relate to the goals by which economic activities are to be judged. In the Bangladesh planning documents, the emphasis is on planning as a device for improving the standard of living for the masses. This kind of goal would seem to be reasonably well measured by per capita income, especially if one assumes that the relative income distribution is not adversely influenced by the events under examination. The scientific component of the VBP involves assessing the changes in the standard of living (i.e., the political goal) which result from reducing the number of births. The overall benefits of the family planning activity are the product of the number of births

prevented, BP, and the value of a birth prevented, VBP.

$$\text{Benefits} = BP \times VBP$$

Most economic investments have their primary or exclusive impact on the numerator of the per capita income expression. Family planning investments have their impact on both the numerator and the denominator of the expression. Consequently the VBP cannot be estimated simply by assessing the impact of population growth on GNP. Adjustments must also be made for the fact that the denominator is decreasing. Table 4 presents some estimates of the VBP based on different assumptions.

A substantial impact results from the pure denominator effect. If we calculate the amount of additional income (economic activity) that would have to be generated in each of the next 25 years to provide the high population (that is the one that has not been influenced by a hypothetical investment in family planning) with the same per capita income enjoyed by a lower population (that has been reduced thanks to an investment in family planning) and discount[3] the resulting numbers, the value of a birth prevented comes to Tk 15,570. This is a pure denominator effect.

Population growth also has a number of numerator effects. That is to say, the size, age structure and rate of growth influence the overall size of national income in many respects.

For example, population growth eventually influences the size of the labor force and the amount of savings and investment taking place in the economy. It may also have important effects on technological change in the economy. Unfortunately, while there is agreement that these numerator effects exist, there is less agreement about the magnitude, or in a few cases such as that of technology, even the direction of the effects. The literature does agree that these effects will be strongly influenced by the social, demographic and economic context; the effects of population growth will be different in Bangladesh from what they would be in France or Saudi Arabia. There is also an acute lack of relevant research on the situation in Bangladesh. In any event, the numbers shown in Table 4 represent our best judgment as to the VBP, taking into account the various kinds of effects. All of the calculations have been done with a 15% discount rate.[4] The computer program used to generate the results allows us to examine alternative assumptions. The results shown in the table reflect the important sources of variation in the estimates.

An alternative approach to estimating the effects is to concentrate only on the effects of population growth on government expenditures. Some kinds of expenditures such as education are extremely sensitive to the size of the population receiving services. In Table 4 we show the calculated savings from the education sector and from all public expenditures on the assumption that a reduction in population growth reduces the

need for public expenditure by the magnitude of the reduction in population multiplied by the level of per capita expenditure expected in each year. The considered expenditures have been restricted to those in the ADP budget on the assumption that observed or targeted general revenue budget expenditures, e.g., defense, may not vary with population. In the case of education, we have measured the effects in terms of the age structure of school entrants, but for the more general social expenditures we lacked the information for such refined estimates. Note also that what we are calling "savings" here are hypothetical and may not lead to a corresponding reduction in the government budget. The government may, for example, choose to spend the "savings" from education sector to permit a higher level of expenditure per student or a higher enrollment rate. Under the savings for education criterion, VBP is Tk 580; under the ADP criterion, it is Tk 1,905. Both of these estimates are considerably lower than the other estimates presented here, but, of course, it must be remembered that they reflect gains only in the public sector. Even under this restricted definition of the benefits, the economic returns from the program greatly exceed the costs.

In sum, estimates of the value of preventing a birth vary over a fairly wide range. For the purpose of further discussion, we will use an estimate of Tk 10,000 per birth prevented (see Table 4).

Table 5 provides estimates of the budgets and expenditures on family planning for the most recent three year period for which the data can be assembled. (A brief appendix discusses the flow of resources in the family planning sector.) Note that there is a sizable difference between the budget allocation and the actual expenditure, and that adjustments have been made for some expenditures (Revenue Budget, Commodity Assistance and non-project NGO support) which fall outside the government ADP budget. The reader should also be warned that while these estimates have been done with care, there may be a considerable level of error in the data due to incomplete information or reporting error. Expenditures are estimated to be increasing at a rapid rate. We estimate that they may have reached a level as high as Tk 126 crore, or $54.73 million, during 1983.

The estimated gross benefit from the program in 1983 is then Tk 9,116.01 million calculated as the product of the number of adjusted birth preventions from Table 3 and the Tk 10,000 estimate of the VBP. The total estimated expenditures during the same period were Tk 1,258.79 million. Thus, the project for that year is estimated to have generated benefits substantially greater than costs; the ratio of benefits of costs for 1983 is 7.24. This number depends on the assumptions and the data used in the process of estimation and could be substantially lower or higher if other assumptions are used. On the whole, however, we have tried to be conservative in our approach, and the data

suggest that, from an economic perspective, the family planning program is easily justified. Whether all of the components of the program are so easily justified or whether the program is as productive as possible is another question. The next section will discuss these issues.

II. Component Analysis: Are all of the various components of the program justified in terms of the benefits they generate? Are some elements in the program yielding a higher level of return than others?

While, for the sake of convenience, we tend to think of the family planning program as a single unit, it is, in fact, composed of many sub-activities.

The results presented in the previous section of this paper relate primarily to the overall national program. They show that family planning in Bangladesh generates far more benefits than costs for the country as a whole. Despite these results, it is relevant to ask whether the economic balance sheet is as favorable for the individual components of the program as it is for the program in its entirety. Answering this question requires additional data on the components of the program, and unfortunately, that data are only available on the basis of some special assumptions about costs and, even then, is possible for only a small proportion of the overall program.

An examination of the individual sub-activities can provide an idea of the extent of variations in efficiency, i.e., costs per unit of impact, within the larger system. Two generalizations facilitate judgements about the comparative efficiency of different units. First, each activity should be justified by generating benefits in excess of its costs. Second, where activities are competitive, and where there is a binding budget constraint, the lower cost activities are to be preferred over high cost activities. Data limitations preclude estimation of the costs or the demographic impact for all of the relevant sub-programs in the government system. In particular we do not have cost and impact information for the various geographic subdivisions in the programs administered directly under the MOHPC. Thus for the present analysis we will concentrate on comparisons among the Social Marketing Program (SMP), the USAID-sponsored non-governmental organizations (NGO's), and the rest of the government program, including non-USAID-funded NGO's, which we will refer to as the "Residual". Two kinds of analysis are presented. First, we compare the costs of each component of the program with the benefits it generates to see if that program component can be justified. Second, we estimate the cost per unit of demographic impact for the different program components.

Table 6 presents an array of benefit-cost estimates for the identified program components for 1982 and 1983. These

estimates assume that the VBP of Tk 10,000 is appropriate for both years. Note that in all cases the benefits exceed the costs by a considerable margin. Thus, unless the programs are seen as directly competitive, all are easily justified in economic terms.

Table 7 provides some basic estimates of the levels of expenditure per couple year of protection for the various components of the government program. As noted above the "residual" program is, by far, the largest unit under consideration, and future efforts should be oriented towards further dissaggregation, separating out non-USAID-funded NGO costs, examining costs of clinical programs versus non-clinical, calculating the cost-effectiveness of programs organized in different geographical regions. The data do show that there is considerable variation among the three program components in both 1982 and 1983. The costs for the NGO program are substantially less than those for either the SMP or the residual program. Moreover, the estimate is based on the most unfavorable interpretation of NGO costs, including no referral credit and overseas overhead.

Since these results are sensitive to the underlying assumptions about demographic impact and the allocation of costs, Table 8 provides some alternative estimates. Panel A shows that under different assumptions about demographic impact, the SMP looks much better. As might be expected, the change that makes the difference is altering the number of condoms assumed to

provide one CYP from 250 to 100. Panel B shows that when it is assumed that some of the costs of running the NGO and the SMP program are carried as a part of the residual budget, the cost-effectiveness ratio looks more favorable to the Residual program. In all cases, however, the NGO program is shown to be the most cost-effective of the program components among those examined.

Care must be exercised in the interpretation of these results. All three of the subprograms identified for analysis meet the criterion that the benefits they generate exceed the costs. They do differ in cost per CYP or per birth prevented, but on the whole they are not competitive projects. Rather, they are directed towards different markets or social niches; they are designed as complements rather than substitutes. In short, a retrospective examination suggests that all three family planning activities are easily justified in the aggregate.

The complementarity of the different program components can be viewed in a somewhat different manner. It seems clear that the long run success of the family planning program cannot be based exclusively on sterilization. Survey results and common sense both suggest that many users are not ready to use permanent and irreversible methods. Moreover, many couples who will eventually use sterilization begin with temporary and non-clinical methods. Thus, a mix of temporary and permanent methods is essential for a complete program, and the SMP has the lowest

cost per CYP for methods other than sterilization.

Assuming that there is a need for both temporary and permanent methods, it is interesting to speculate on the cost-effectiveness of alternative ways of delivering each type of contraception. From this perspective, using calculations not shown here, the SMP can be shown to be a cost-effective approach to delivering temporary methods of contraception. Moreover, the residual program is a relatively expensive way to deliver sterilization services. In other words, the relative cost-effectiveness of the three major sub-programs is in many respects the result of the mix of contraceptive methods used by each. If there is no severe lack of resources for family planning and if it is considered important to maintain a balance between sterilization and other forms of contraception, then both the NGO and the SMP programs are important and economically justified complements to the residual program.

III. Conclusions and Some Thoughts on the Relevance of These Findings for the Future: What are the implications of the empirical record for the future?

The data in this paper are incomplete in many respects, but they do suggest important conclusions about family planning programs in Bangladesh. A first conclusion is that the support that is given to family planning seems to be well justified by

the demographic and economic impacts that it generates. It is easy to be pessimistic about the pervasive poverty in Bangladesh and the difficulties that are often encountered in the implementation of programs and conclude that nothing worthwhile is happening. While the data are far from perfect they seem to suggest that some important things are beginning to happen to contraceptive practice. A second important conclusion is that the program's impact is by no means uniform throughout the range of sub-activities that make up the national program. The aggregate of USAID-funded NGO programs examined here, for example, has a lower cost per unit of demographic impact than the SMP or the Residual Program. As we have seen in the previous section, the SMP seems to be the lowest cost method of delivering family planning services other then sterilization. There also seems to be some variation from one year to another in the cost per birth prevented of offering family planning services, and it seems likely that if the data for different regions or administrative units were available, it would similarly show considerable variation.

The fact that there is this variation in performance suggests the possibility that program administrators may be able to find ways of making the program yet more effective. Both by shifting resources from low productivity to high productivity activities, e.g., expanding the proportion of the budget devoted to NGO activities, and by searching for new medical and

administrative technologies to improve the level of acceptance of family planning, the return from these investments can be increased. The primary goal is to increase the overall contribution that family planning makes to development. We believe that the evidence provided here supports the idea that even though the budget for family planning has increased significantly in recent years, even more can be done in an economically justifiable effort. As a secondary goal continuing efforts should be made to scrutinize the components of the program in an effort to find ways to increase efficiency.

FOOTNOTES

1. The figure 3.5 is approximate and is derived by calculating the inverse of the age-specific fertility rates in the ages during which contraceptive adoption takes place most frequently (i.e., 25-29 and 30-34). The age-specific fertility rate for the age group 25-29 reported for the Bangladesh Fertility Survey of 1975 was 291 per thousand, which is approximately consistent (1.0.291 = 3.44) with an average interval between births of 3.5 years. The average rate for the 30-34 age group is consistent with an interval of approximately 4 years, but in both cases the numbers are probably too high, since contraceptors are selected for higher fertility than the general population.

2. The estimation of the impact of condoms is particularly difficult, since the major source of information concerning condom use is the set of service statistics which indicate how many condoms have been introduced into the commercial network by the Social Marketing Program (SMP) or distributed free by government health centers. In either case the numbers refer to distribution, not use. We have made our estimate of 300 condoms by dividing the number of condoms sold or distributed during 1983 by the product of the number of women the Planning Commission estimates to have been eligible at mid-1983 and the estimate of condom prevalence drawn from the couple sample of the 1983 Contraceptive Prevalence Survey (300 equals approximately 127 million pieces/(5.465 million eligible couples x .027)). This number, which represents our estimate of actual use patterns, is obviously more than would be needed by an average couple, suggesting that some condoms must be lost in the process of distribution.

3. Discounting is a procedure used by economists to compare economic events in different years. It consists of dividing the number to be discounted by a discount factor dependent upon the discount rate and the number of years elapsed between the base year and the reference year.

4. This is the rate used by economists doing analysis at USAID office in Dhaka. Lower rates typically yield estimates of the VBP that are higher, since the effects of a reduced population take a long time to work out and are heavily discounted by the use of the 15% rate.

FIGURES AND TABLES

Table 1

Contraceptive Distribution by Year and Method

Method	Unit	Year 1982	1983	1984
Oral Pill	cycles (1000)	8122	8839	10935
Condom	pieces (million)	107	128	157
Emko	vials (1000)	67	72	64
Foam Tab	pieces (million)	4	6	4
Injection	units (1000)	64	108	141
IUD/Cu T	units (1000)	108	182	400
Tubectomy	operations (1000)	297	290	336
Vasectomy	operations (1000)	97	113	306

Table 2

Assumptions Used for Calculating Demographic Impact of Contraceptive use

A. Temporary methods

Method	Units per CYP	CYPs per BP	Units per BP	Discount Rate	Adjustment Factor*
Oral Pill	14.00	3.5	49.000	15	0.87
Condom	300.00	3.5	1050.000	15	0.87
Emko	5.33	3.5	18.655	15	0.87
Foam Tab	125.00	3.5	437.500	15	0.87
Injection	4.00	3.5	14.000	15	0.87

B. Long-term methods

Method	Units per CYP	CYPs per BP	Units per BP	Discount Rate	Adjustment Factor*
IUD/Cu T	2.45	3.5	0.70	15	0.756
Tubectomy	7.75	3.5	2.21	15	0.572
Vasectomy	7.75	3.5	2.21	15	0.572

* Average expected lifetime of effects of method used in calculating adjustment factors:

Temporary methods= 1.0 year
IUD/Copper Tube= 2.0 years
Sterilizations= 4.0 years

Table 3

Adjusted Births Prevented by Year of Contraceptive Adoption and Method (thousands)

Method	1982	1983	1984
Oral pill	144.135	156.855	194.055
Condom	88.919	105.731	130.021
Emko	3.146	3.355	2.983
Foam Tab	8.240	11.030	7.950
Injection	4.005	6.678	8.758
IUD/Cu T	57.239	96.089	211.720
Tubectomy	376.474	367.132	425.384
Vasectomy	122.642	143.132	387.404
Total	804.801	890.002	1368.275

Note: see Table 2 for assumptions used in calculations

Table 4

Alternative Estimates of the Value of a Birth Prevented
Discount Rate=15%, Values in Taka, for 1983-84

ASSUMPTION	VALUE OF A BIRTH PREVENTED
A. Effects on Per Capita Income:	
1. Pure Denominator Effect (INDEP)	15,570
2. Mixed Numerator and Denominator Effects:	
a) Population growth increases Labor Force and thus GNP (LAB FORCE).	12,309
b) Population growth discourages saving and thus decreases GNP (SAVING).	19,062
c) Population growth forces technological innovation increasing GNP (TECH).	10,432
d) Combined 2a, 2b, and 2c effects.	10,664
B. Effects Resulting from Social Expenditure Savings:	
1. Savings in education sector (EDUC).	580
2. Savings in all ADP Expenditures (ADP).	1,905

Table 5: Expenditure on Family Planning in Bangladesh
1981-82, 1982-83, 198384

Item	1981 -1982 Alloc.	1981 -1982 Expend.	1982-1983 Alloc.	1982-1983 Expend.	1983-1984 Alloc.	1983-1984 Expend.
A. In lac Taka						
1. ADP:Ministry(a)	7869.00	3424.57	7657.26	6397.87	9975.00	8490.38
Multisectoral(a)	759.00	580.43	907.74	726.13	913.00	879.00
Subtotal	8628.00	4005.00	8565.00	7124.00	10888.00	9369.38
2. Revenue Budget(b)	1120.00	1321.00	1231.00	1452.00 (c)	1291.00	1523.00
3. Total GOB		5326.00		8576.00		10892.38
4. Non-ADP or project commodity and NGO support	1350.08 (d)	1350.08	3812.64	3812.64	3685.71	3685.71
5. Unadjusted total		6676.08		12388.64		14578.09
6. Adjustment(e) to avoid ADP overlap		-893.00		-790.00		-960.00
7.Adjusted Grand Total		5783.08		11598.64		13618.09
8.Estimated expend. in calendar year			8690.86		12608.37	
A. In $ millions U.S.						
9. Dollar conversion (Tk/$)		20.00		22.00		24.00
10.Estimated expend. in BDG Fiscal Year in $		28.92		52.72		56.74
11.Estimated expend. in calendar yr. '82&'83			40.82		54.73	

Sources and Notes:

(a) ADP expenditure on Family Planning
Source: Planning Commission.

(b) Source: GOB, Demands for Grants and Appropriations, 1983-84, p.113.

(c) Revenue Budget expenditures are assumed to be 1.18 x reported 1981-82 allocations.

(d) Allocation for US fiscal year is assumed to be fully spent next BD fiscal year.

(e) Planning Commission estimates under Row 1 already include this amount as an estimate of Row 4.

Table 6

Benefit-Cost Calculation for the Components of the Bangladesh Family Planning Program

Year	Source	Benefits (B) (Tk in m)	Costs (C) (Tk in m)	Net Contribution (Tk in m)	B/C Ratio
1982	SMP	207	108	99	1.9
	NGO	209	85	124	2.5
	Residual*	1140	665	476	1.7
	Total	1556	857	699	1.8
1983	SMP	272	146	126	1.9
	NGO	252	100	152	2.5
	Residual*	1222	1012	209	1.2
	Total	1746	1259	487	1.4

* "Residual" includes all family planning program services except those delivered under the SMP and USAID-funded NGOs

Table 7

Cost Effectiveness of the National Program by Sub-component: Standard Assumptions

Year	Source	Cost (million $)	Impact** (million ABP	Cost-Eff. Ratio
1982	Residual*	31.648	0.606	52.186
	SMP	5.140	0.083	61.714
	NGOs	4.030	0.115	35.025
	TOTAL	40.818	0.805	50.718
1983	Residual	44.021	0.645	68.204
	SMP	6.360	0.109	58.103
	NGOs	4.350	0.135	32.200
	TOTAL	54.732	0.890	61.496

* "Residual" includes all family planning program services except those delivered under the SMP and USAID-funded NGOs

** ABP Assumptions are in Table 2

Table 8A

Sensitivity Explorations of Cost Effectiveness Analysis of the National Program by Sub-Component: Estimates with Changes in the Impact Assumptions

Year	Source	Cost (million $)	Impact** (million ABP)	Cost-Eff. Ratio
1982	Residual*	31.648	0.670	47.206
	SMP	5.140	0.198	25.932
	NGOs	4.030	0.125	32.217
	TOTAL	40.818	0.994	41.076
1983	Residual	44.021	0.704	62.497
	SMP	6.360	0.258	24.669
	NGOs	4.350	0.151	28.744
	TOTAL	54.732	1.114	49.151

* "Residual" includes all family planning program services except those delivered under the SMP and USAID-funded NGOs

** Assumptions as in Table 13 except 100 condoms = 1 CYP, & 13 cycles of oral pills = 1 CYP

Table 8B

Sensitivity Explorations of Cost Effectiveness Analysis of the National Program by Sub-Component: Estimates with Changes in the Impact Assumptions

Year	Source	Cost (million $)	Impact** (million ABP)	Cost-Eff. Ratio
1982	Residual*	31.143	0.606	51.352
	SMP	5.243	0.083	62.948
	NGOs	4.433	0.115	38.527
	TOTAL	40.818	0.805	50.718
1983	Residual	43.459	0.645	67.333
	SMP	6.487	0.109	59.265
	NGOs	4.785	0.135	35.420
	TOTAL	54.732	0.890	61.496

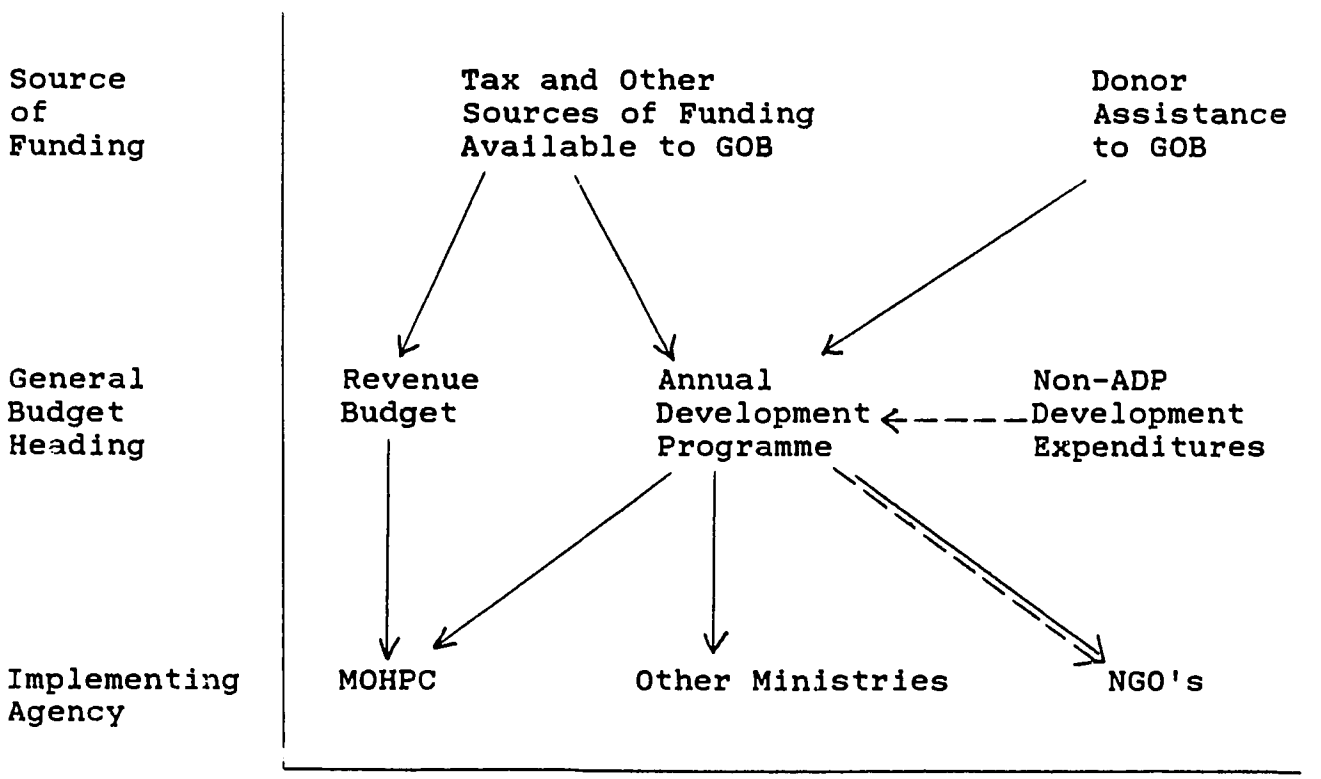
* "Residual" includes all family planning program services except those delivered under the SMP and USAID-funded NGOs

** 10% of NGO Cost added for indirect NGO costs; 2% of SMP Costs added for indirect SMP costs

APPENDIX

Figure 3 illustrates the complex flow of resources with the population sector in Bangladesh. Resources are available either from internal sources or from international donor agencies. The funds available from these three sources flow through three general budget headings. The Revenue Budget, which is used to fund the activities of agencies such as police, tax collection and key personnel from other ministries, such as the Ministry of Health and Population Control,is funded from internal sources of funding. The Annual Development Programme (ADP), the collection of activities oriented towards "development" and implemented by a variety of agencies, is funded partly from internal resources but mostly from funds provided by bilateral and multilateral international assistance. Many of the funds in this category are directed towards specific development activities, such as family planning. Most of the funds available for family planning in Bangladesh are included in either the Revenue Budget or the ADP. There are a few activities which fall outside of both the ADP and the Revenue Budget. USAID, for example, provides contraceptives to both MOHPC and NGO programs and this assistance is in kind. There are also some NGO programs which are not formally budgeted through the ADP. These activities are approved by the GOB, but are only partially accounted for in the ADP budget. The Planning Commission makes an estimate of what these flows are each year, but our impression is that the amounts actually spent exceed those budgeted by the Planning Commission. In Figure 3, we have

included broken arrows to indicate the partial flows assumed by the Planning Commission. In our estimates of the amounts of money spent on family planning, we have summed the three general expenditure headings and adjusted for the extent to which non-ADP expenditures are already included in the Planning Commission's estimates.

Figure 3

The Flow of Family Planning Expenditures in Bangladesh