Mauldin, W. Parker; Ross, John A.: Family Planning Programme Effort in South Asia. Social Change. Sept-Dec 1994. 24(3 & 4). p.93-117.

Family Planning Programme Effort in South Asia

Parker Mauldin
John A. Ross

All five countries of South Asia, containing over one-fourth of the developing world's population, increased the effort levels of their national family planning programs over the 17 years from 2 to 1989. However, 30 measures of effort show much disparity among the five in the amount increase and in variability across the kinds of effort. The higher the overall effort, score the less variability, and the better the scores for service arrangements and for the availability of contraceptive methods. All these results parallel differences among the countries in rising contraceptive use and in fertility decline. 'The five countries also differ sharply in their likelihood of reaching replacement fertility by the Year 2015. A variety of predictive indicators, combined a single composite index, suggest that only Sri Lanka is certain to reach that goal, that only is "probable" to do so, that Bangladesh is 'possible,' and that Nepal and Pakistan are unlikely.' The actual outcomes will reflect both the degree of program effort and the pace of modernization; in any case very large increments to population size are built into the age the vast body of family planning research there c few attempts to measure program inputs dependently of program outputs. There is however a series of investigations, in 1972, 1982, 1989, that assesses the effort levels, or strengths, of all large scale programs (Mauldin Ross, 1991). This article uses information m this series as it bears on South Asia, to sent detailed country scores and to discuss are developments.

The purposes of this discussion we consider the Asia to include the five countries of Bangladesh, India, Nepal, Pakistan and Sri Lanka. Dr social and economic conditions, combined high fertility and rapid rates of population with, have led each of these countries to adopt population policies designed to reduce fertility and rates of population growth. Policies to reduce rates of population growth were adopted relatively; early by each country, in the region, but implementation of the programs has varied in intensity and effectiveness. The effort scores presented here depict numerous facets of these changes.

Background

The demographic situation of these countries is well known to the readers of this journal, but a brief recapitulation may be useful. From 1950 to 1990 the

population of each country in the region averaged more than two percent growth per year, with Sri Lanka having the least rapid rate of growth (2.02 percent per year) and Pakistan the most rapid (2.74). In absolute numbers the combined populations of the region increased by 660 millions from 455 to 1,115 millions.

At the beginning of this period, life expectancy at birth was less than 40 years except in Sri Lanka where it was about 56 years. Male life expectancy was greater than that of females in each country, and with the passage of 40 years only in Sri Lanka does female life expectancy clearly exceed that of males. In India, female life expectancy is calculated to be 60.67 for the period 1990-1995, and that of males slightly less at 60.08. In the other countries the values for males and females are about the same, with males slightly exceeding those of females in Bangladesh and Nepal.

Infant mortality has declined by almost 100 points from 1950-55 to 1990-95, but remains close to 100 in Bangladesh, Nepal and Pakistan, and 88 in India. Sri Lanka had lower infant mortality in the earlier period (90), and now has a rate of about 24. Adult literacy has more than doubled during the past four decades but is only 35 or less in Bangladesh, Pakistan, and Nepal. India has done better, but even so more than half of adults are illiterate. Adult female literacy is extremely low throughout the region (13 to 34 percent) except in Sri Lanka where it is 83 percent.

Table 1: Estimates for GDP and GNP Per Capita

	PPC Estimate of GDP Per Capita	**GNP Per Capita Based on Exchange Rates**
Bangladesh	1,160	220
India	1,150	330
Nepal	720	180
Pakistan	1,970	400
Sri Lanka	2,650	500
United States	22,130	22,240

Primary plus secondary school enrolment averages about 70 percent for males, and 50 percent for females. The largest differential is Nepal 80 percent for males but only 39 percent for females but the lowest females enrolment ratios are in Pakistan where only one in five females in the relevant age range is enrolled in school.

Each of the countries in South Asia is classified the World Bank as 'low income' nations. Average annual increases in GNP- per capita 1965-1990 were less than one percent in Bangladesh and Nepal, almost two percent (1.9) India, 25 in

Pakistan, and 2.9 percent in Sri Lanka. In the World Development Report of 1993 for the first time the World Bank gave estimates of per capita GDP based on purchasing power of currencies (PPCs) as well as GNP per capita based on exchange rates. The 1991 estimates for South Asian countries along with those for the United States of America are given below.

The starkness of the differentials of industrialized countries and those of South Asia, for example, is greatly lessened by the estimates of GDP per capita based on purchasing power of currencies. However, the differentials remain very large, particularly for Bangladesh, India and Nepal.

Literature Review

The First undertaking to measure program independently of outputs was by Lapham & Mauldin (1972). They developed 15 input measures, applied them to 20 countries, and set an evaluation framework as a context for the general approach.

Those scores were applied to 46 countries by, Freedman and Berelson (1976) in a comprehensive review of families, planning programs, and to 96 countries by Mauldin and Berelson (1978) in their study of the conditions of fertility decline. An entirely new questionnaire in 1982 by Mauldin and Lapham produced information for an expanded set of 30 scores on countries, which they used in a series of analyses and publications (Lapham and Mauldin, 1984 and 1985; Mauldin and Lapham, 1985a and 5b). The present study has replicated that investigation through a 1989 questionnaire inquiry to the same countries. The most recent calculation for the demographic impact of the programs for the entire developing world is by Bongaarts, Mauldin, and Phillips (1990).

The 1982 measures have been employed by a member of analysts for a variety of purposes. Jain (1989) used the measures in his study of the effects of an improved method mix, and Entwisle, Mason, and Hermalin (1986) used them with WFS survey data in their multilevel inquiry into the, determinants of contraceptive use. Updated scores for Zimbabwe were published by Boohene Dow (1987) in a reassessment of that country's program.

Other authors have reviewed the literature on particular program inputs; for example, the assessments of contraceptive availability by Tsui and Ochoa (1991), of government policy positions concerning fertility interventions by the United Nations Population Division (1990a and 1990b: 3, p. 107), of donor financial inputs by and Thomas on behalf of UNFPA (United Nations Population Fund, 1989), of social marketing (Sheon et al., 1987), of community based programs

(Ross et al., 1987), and of access to birth control (with modifications and updates of certain of the measures) (Camp and Speidel, 1987).

The 30 scores, measured across 100 countries, provide a 30 by 100 matrix. Entwisle (1989), applying confirmatory factor analysis to the matrix, presented eight underlying dimensions to the 30 scores, which she compared to the four groupings of the scores used here and in the 1982 work. Entwisle (1989), Nortman (1981), and Hemandez (1989) have all commented on the difficulties of conceptualizing and measuring a clean set of program effort measures. In other work, Ness and Ando (1984) undertook an extensive study of Asian programs that related the Mauldin Lapham inputs to outcomes, but they also added measures of political commitment and strength to their analysis.

A separate but related body of work is concerned with the 10 principal technical methods of assessing program effect on fertility, and some of these employ the degree of strength of the program, as opposed to using its mere presence or absence. The publications cited above by Freedman, Berelson, Mauldin, and Lapham all applied multiple regression methods to area (national) units of observation using the degree of program strength. During the 1970s, the United Nations Population Division, in co-operation with the International Union for the Scientific Study of Population (IUSSP), stimulated numerous analyses of program effort, which used various methods (United Nations 1978a, 1981, and 1985). Manual IX (United Nations, 1978b), presents these methods and illustrates their application. Other estimates of program effects, either on the fertility of acceptors or on the general population, proliferated from the mid 1960s onward, and these were reviewed through the late 1970s according to their methodological character (Forrest and Ross, 1978; Ross and Forrest, 1978), and again through 1989 (Ross and Lloyd, 1991).

Most multiple regression analysis across national units has shown separate effects on fertility by program effort and by favorable social settings, and a strong joint effect (Mauldin and Ross, 1991). Critics have been skeptical of both the method and the results; an example is Hemandez (1984), who also takes a critical position (1988) toward the volume, issued under National Academy of Sciences auspices (Lapham and Simmons, 1987). Several chapters in that volume concern the program-fertility question with respect to both methods and findings, and much of the detailed literature is reviewed there. A careful recent assessment of a broad range of evidence on the subject was made by Freedman and Freedman (1991).

Program Effort Measures

Ninety-eight developing countries were rated according to the strength of their family planning program efforts in 1989. Countries were rated on 30 items that are grouped into four components for descriptive purposes: policies and stage setting activities, service and service related activities, record keeping and evaluation, and availability of contraceptive methods.

A detailed questionnaire was prepared in English, and translated into French and Spanish. Questionnaires were sent to four types of respondents in the late summer and early fall of 1990: 1) government officials directly involved in implementation of family planning programs 2) donor personnel (in UNFPA, the World Bank, USAID, CIDA, SIDA, ODA, etc.), 3) citizens in the various countries who were knowledgeable but not involved in policy or management of programmers and 4) knowledgeable foreigners.

Program effort, as used in this article, means the sum of policies adopted and implemented; the activities carried out to provide family planning knowledge, supplies and services; the availability and accessibility of a number of fertility regulation methods; and the monitoring and evaluation of these. The following thirty items were included in the questionnaire (details in Appendix A):

Policy and Stage-Setting Activities

1. Policy on fertility reduction and family planning

2. Statements by leaders

3. Level of program leadership

4. Policy on age at marriage

5. Import laws and legal regulations

6. Advertising of contraceptives allowed

7. Involvement of other ministries and public agencies

8. Percent of in country funding of family planning budget

Service and service-related activities

9. Involvement of private-sector agencies and groups

10.Civil bureaucracy involved

11.Community-based distribution

12. Social marketing

13. Postpartum program

14. Home-visiting workers

15. Administrative structure

16. Training program

17. Personnel carry out assigned tasks

18. Logistics and transport

19. Supervision system

20. Mass media for IEC

21. Incentives and disincentives

Record-keeping and evaluation

22. Record-keeping

23. Evaluation

24. Management's use of evaluation findings

Availability and accessibility of fertility-control supplies and services

25. Male sterilization

26. Female sterilization

27. Pills and injectables

28. Condoms, spermicides, foam, diaphragms

29. IUDs

30. Abortion

A Criticism of relying on judgements of knowledgeable family planning program senior personnel and observers is that persons who are jar with fertility and contraceptive prevalence trends might tend to give more favorable answers than those who are not aware of those trends. However, it should be noted that respondents answered questions about program activities for example whether or not there was a community based distribution program, and if so what proportion of the population was served it; what was the nature of record keeping and feedback of information, etc. They did not assign scores to the various items. The authors developed scores based on respondent answers to questions about program activities, with scores ranging from zero to four for each of the 30 items.

The maximum possible total score was 120. Actual scores ranged from zero to 101, the latter for China.

In response to criticism that knowledgeable persons may present biased pictures of program effort, a recent study attempted direct measurements of program effort in Bangladesh Kenya. The principal investigators in each country reviewed local literature and selected media outlets, interviewed policy makers and program managers, visited hospitals, and obtained information from Management. Information System units of the ministry. The study demonstrated that the differences in the scores being slightly higher than scores based on judgement (Mauldin et al, forthcoming) Also, while it was possible to generate more objective measures for of the 30 program effort variables, this cannot serve as a practical substitute for the current methodology due to the high-costs, time, and personnel required.

A score of four does not mean that the maximum possible is being accomplished on that item. For example, a score of four on the training item can be obtained by having 'very good' answers on training for two categories of personnel, and 'moderately good' on training for four other categories. Such a country might have poor training for another category of personnel; in any case, the 'moderately good' situations could be improved. The reported scores represent the authors' best judgement based upon the replies received and other relevant information. As an example, when one respondent was highly deviant from other respondents on an item, we discounted that answer. However unless there was a specific indication otherwise we took the mean of respondent scores on each item for each country.

The 1982 questionnaire was sent to approximately 630 persons, of whom 433 replied; the 1989 questionnaire was sent to about 550 persons, and responses were received from 359. This gives response rates of 69 percent in the 1982 study and about 65 percent in the 1989 study. Nearly all developing countries with a population of a million or more are included; for obvious reasons we omit Liberia, Kuwait, and Iraq.

Results

Table 2 presents summary scores for the five countries. The total score is to the left, followed by the score for each of the four dimensions, all given as the percent of the maximum score possible (which varies due to differing numbers of score items in each dimension. Because each score can vary from 0 to 4, the maximum for all 30 scores in the total column is 120). Sri Lanka is highest overall and highest on services and on evaluation, and is high also on availability. Bangladesh and India come next, tied on the total score but otherwise close only on evaluation, with 8-10 points difference on the other three dimensions. Nepal is well below them on the total score and on two of the dimensions, particularly on availability. Finally, Pakistan is in the lowest position on all dimensions, and most remarkably so on failing to make contraceptives available to the general population.

Table 2: Programme Effort Scores, 1982 and 1989, for Total Score and Four Dimensions (Percent of Maximum)

		Total	**Policy**	**Service**	**Evaluation**	**Availability**
Bangladesh	1982	57	58	55	43	68
	1989	72	73	73	56	78
India	1982	66	81	62	60	58
	1989	72	81	63	58	87
Nepal	1982	37	55	30	42	27
	1989	59	65	62	58	45
Pakistan	1982	40	59	28	53	37
	1989	48	58	49	54	28
Sri Lanka	1982	67	67	68	59	70
	1989	80	69	82	87	84
Maximum Score		(120)	(32)	(52)	(12)	(24)

All five countries have improved their scores over the seventeen years shown in Figure 1 (Figure 1 is missing), especially Bangladesh, whose score rose impressively from its very low level in 1972, just after the disruptions of the

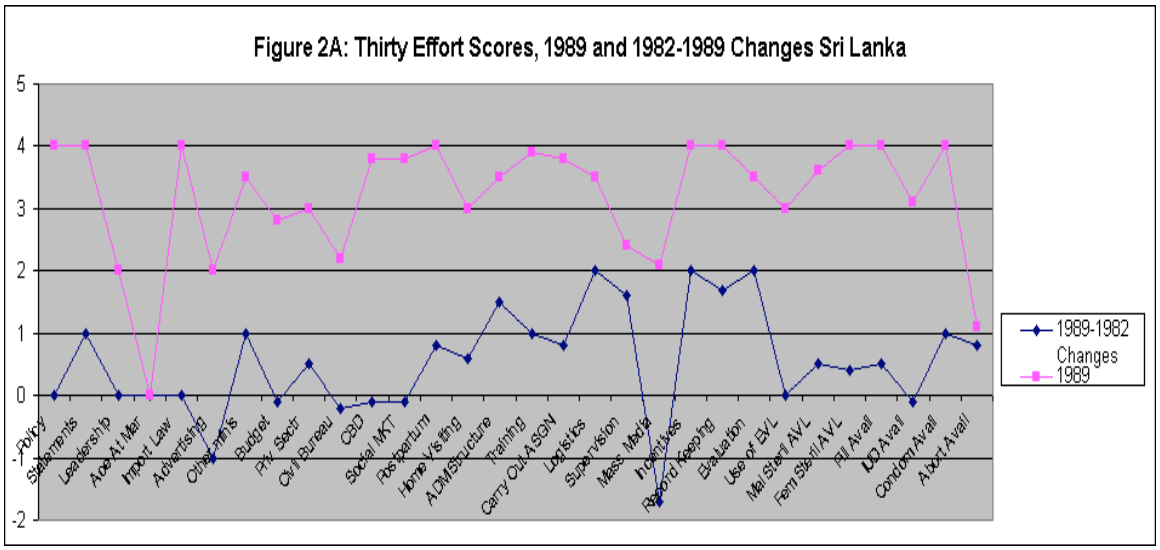
Independence struggle. India, having established a national policy in 1952, was at the highest level two decades later, in 1972, but it rose only nine points after that, to same level as Bangladesh in 1989.

Sri Lanka, like Bangladesh, experienced a substantial rise in each of the two periods shown it now places first, at 80 percent of the maximum score. Pakistan and Nepal have exchanged places since 1972; Pakistan now ranks last. The spread of the scores for the five countries, if India is left aside, has hardly changed: the spread for the other four was 30 points in 1972 and 32 in 1989. The mean score rose from 32 to 53 to 66 over the three dates; without India it rose from a lower start: from 24 to 50 to 65.

Overall there is no sign yet of any fall off in the pace of improvement. On average the slope of change was the same in the two periods (mean line). In two countries the pace rose and in three it declined, but some of these changes were slight.

Profiles

The detailed profiles across, all 30 scores (Figure 2A) (Figure 2B) (Figures 2C) (Figures 2D) (Figure2E). The sequence of the 30 scores the figures is arbitrary, but we have grouped according to four dimensions: first the policy items, then the 13 services items three evaluation items, and finally, the availability items. Small changes in scores are not especially important; we discuss only the larger shifts and the main differences in patterns. The overall rankings are consistent Table 2, but interesting differences emerge in the details.



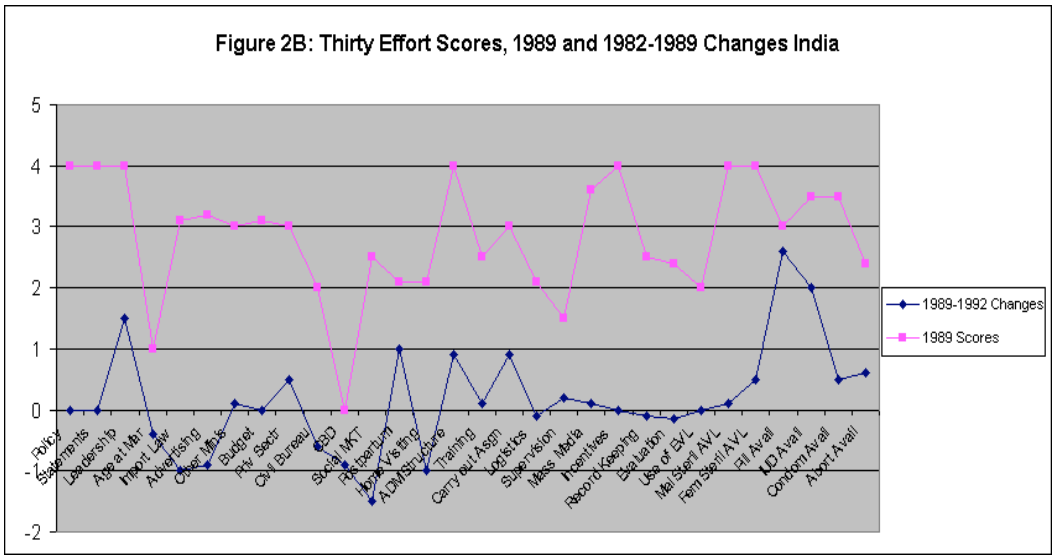


Figure 2B: Thirty Effort Scores, 1989 and 1982-1989 Changes India
5
4
3
2
1
0
-1
-2
1989-1992 Changes
1989 Scores

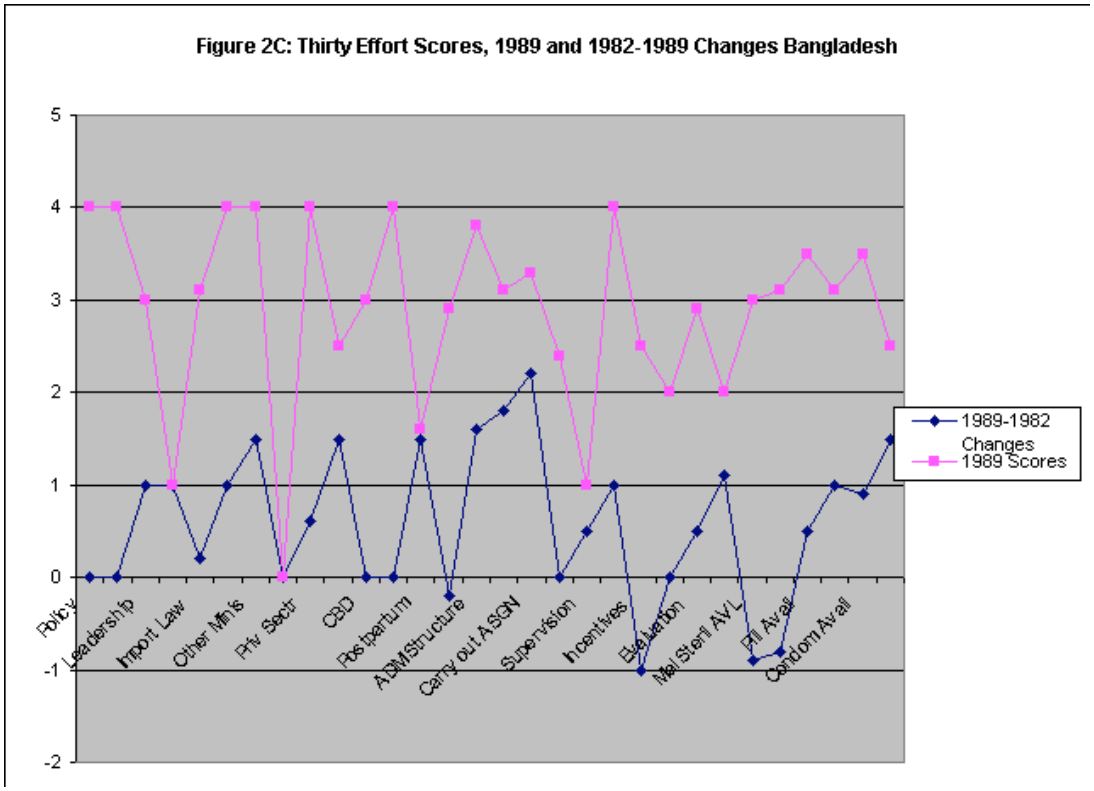
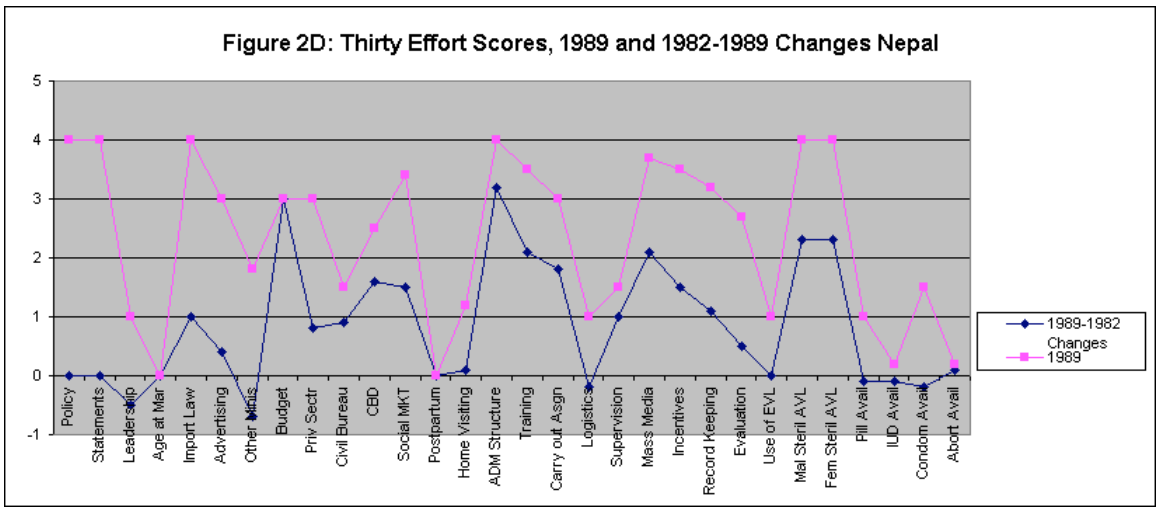
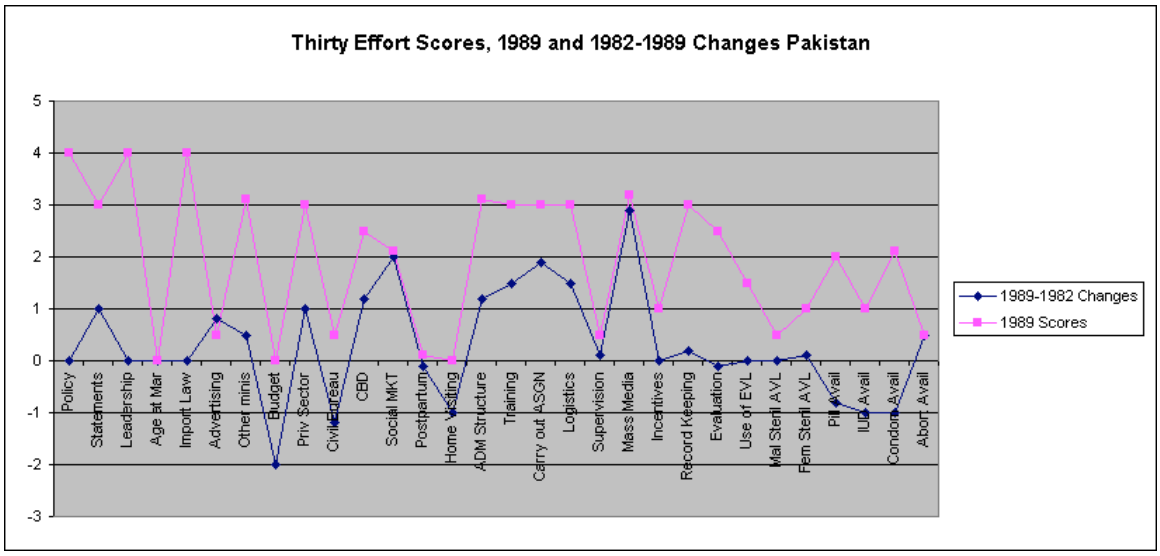


Figure 2C: Thirty Effort Scores, 1989 and 1982-1989 Changes Bangladesh
5
4
3
2
1
0
-1
-2
1989-1982 Changes
1989 Scores
Leadership
Import Law
Other Mins
Priv Sector
CBD
Postpartum
ASMStructure
Carry out ASGN
Supervision
Incentives
Evaluation
Mal Steril AVL
Fml Avail
Condom Avail





In Figures 2A - 2E the top line shows the 1989 score pattern, or profile, and the bottom line shows the 1982-1989 change in each score. We discuss the countries in the order of their total effort score to make clearer the systematic increase in pattern variability as the scores fall. This approach places Sri Lanka first. (All five countries, as well as nearly all of the 98 countries investigated, scored extremely low on marriage item, due in large part to the rules of the original scoring system; therefore, we omit comments on it below.)

Sri Lanka

Sri Lanka's total score of 80 is accompanied by the most favorable pattern (Figure 2A). All scores lie within a narrow range, near the top the figure, with less

variation among them the other countries. The pattern is high ant relatively consistent across the 30 items.

Changes: The total score rose by 13 points (67 to 80) from 1982 to 1989, reflecting positive changes (of one point or more) in nine items declines in only two. Scores for the available dimension were all high; scores for advertising and mass media were relatively lower then most others, as were those for supervision and use of the civil bureaucracy.

The total scores for India and Bangladesh are the same; we discuss India first since historically it has been higher.

India

India pattern is visibly less even than the Sri Lanka one, with more variability across the rare items and within each of the four dimensions. The first three policy ones are as they have been for some years, and several scores fall at 3.0 or above throughout, except for the three evaluation scores. The incentives score is high (4.0) as it is also in Sri Lanka (4.0) and Nepal (3.5); Bangladesh is lower at 2.5; Pakistan is 1.0. Community based distribution (CBD score) is little used, the supervision score is low.

Male and female sterilization are widely available, as reflected in the two scores of four (note that four means availability to eighty percent or more of the population). The pill, IUD, and condom receive lower ratings, though still relatively high ones. Abortion was the least readily available; no doubt the urban population has considerably greater access to it than the rural population.

Changes: Score changes of one point or more from 1982 to 1989 fall on the positive side; only one is negative and six are positive. Most lie close to zero. Social marketing fell, but increases appeared for the leadership score, and for the postpartum, administrative structure, and assignment execution scores. The score for pill availability rose sharply between 1982 and 1989, perhaps because some respondents were thinking of official rather than actual availability to the whole population. The IUD access score also rose.

Bangladesh

The Bangladesh pattern is also more variable than that for Sri Lanka; most scores lie between 2.0 and 4.0, with some unevenness within that range. The budget score is new zero since most funding for supplied. The postpartum and vision scores are relatively low, but the availability scores are high except for the abortion/menstruation regulation one, which has ably risen since 1989.

Changes: Thirteen items rose by one or more points between 1982 and 1989 and Only, one (incentives) fell by that much. However access to and female, sterilization diminished some, reducing those to scores of about three. Increases occurred in each of the four dimensions.

Nepal

Nepal ranks fourth with a total score of 59, which however rose appreciably (from 37 to 59) in the seven year period studied. Its pattern of effort across the 30 items is quite uneven. The availability scores are all low except for male and female sterilization. Other relatively low ones are the use of the civil bureaucracy and postpartum provision of family planning, home visiting by workers, logistics, supervision, and use of evaluation information. Higher scores appear for the basic policy position, substantive government statements, import laws, and selected items in the service dimension.

Changes: As in Bangladesh, many (12) scores rose by one or more points; none fell by that much. Availability of sterilization improved but fell slightly for the pill, IUD, and condom.

Pakistan

The total score for Pakistan rose only modestly (from 40 to 48) over the seven years and remained well below the other four countries. Its pattern is the most uneven of the five, with the low scores at or near zero. This includes especially low scores on the six availability items, as well as on several of the service-related items such as postpartum provision of family planning, home visits by workers, and supervision; other low ones occurred for advertising and for percent of budget locally provided. (The Pakistan score for incentives is low; Pakistan is the only one of the five countries to make very little use of incentives.)

Higher scores were recorded for the basic policy position and for leadership statements, as well as for selected other items in the policy and service dimensions, all within the uneven pattern noted.

Changes: movements up and down, of a point or more, were roughly balanced (five down and eight up). Access to the pill, IUD, and condom fell, as in Bangladesh. The budget item, use of the civil bureaucracy, and home visiting also fell. However scores improved for social marketing and for certain other items in the services dimension.

Time Trends: Changes over the three cycles of the study can be examined in another way. To, simplify comparisons we have divided the total program effort score into four categories using the percent achieved of the maximum possible (120). The categories are Strong (67+%),

Medium (46-66 %), Weak (21- 45 %), and Very Weak or None (0-20 %). In Table 3, we classify the five programs in South Asia as Strong, Moderate, or Weak, in each cycle of the study.

Table 3: Seventeen Year Trend in Strength of Family Planning Programmes

	Date Policy Was Adopted	1972	1982	1989
Bangladesh	1971	Weak	Moderate	Strong
India	1952	Moderate	Moderate	Strong
Nepal	1966	Weak	Weak	Moderate
Pakistan	1960	Weak	Weak	Moderate
Sri Lanka	1965	Moderate	Strong	Strong

Sri Lanka was rated as having a moderately strong family planning program in 1972 but a strong program in 1982 and thereafter. It ranks higher on each of the socio-economic indices than do the other countries in the region. Accordingly, one would expect that its contraceptive prevalence would be higher than that of other countries of the region, and as is shown below, its contraceptive prevalence of 62 percent in 1987 was much higher than that of any other country in this group.

India had moderately strong family Planning programs at the two earlier dates and a strong program in 1989. It ranks next to Sri Lanka on most socio-economic indices and, not surprisingly, has the second highest level of contraceptive prevalence, with 45 percent of married women reported using contraception in 1988. Surprisingly, prevalence in India apparently has dropped in the years since, down to 41 percent in 1992-93.

Pakistan ranks third on most socio-economic indices, but has by far the lowest percentage of females enrolled in primary plus secondary schools. It also fares badly on the strength of its family planning program. Its level of contraceptive prevalence is the lowest of the countries in South Asia, only 12 percent in 1990-91.

Bangladesh ranks below Pakistan on most socio-economic indices, but has more than twice as large a proportion of young girls enrolled in primary and secondary schools as does Pakistan. Its family planning program was weak in

1972, moderate in 1982, and strong in 1989. Its contraceptive prevalence of 45 percent in 1993-94 is generally credited to its strong family planning program.

Nepal ranks last on almost every socio-economic index and its family planning program has been relatively weak during the 1970s and in the first half of the 1980s. Its contraceptive prevalence is low as compared with Sri Lanka, India, and Bangladesh, but is appreciably higher than that of Pakistan.

Client Payments

One of the unusual, almost unique, features of family planning programs in South Asia is payment to clients for sterilization, and sometimes for the IUD. "The use of financial payments as a state instrument of reproductive control is the most controversial and divisive aspect of population policy in developing countries ... Few other demographic subjects have generated so much discussion, such a wide range of opinion, and such large shifts in the policy of donor organizations. (Cleland and Robinson, 1992). Payments to clients have attracted most attention, but payments per case to motivators, recruiters, or referrers have also aroused concern because they may jeopardize the principle of informed consent and free contraceptive choice. Cleland and Mauldin (1991) note that . . . the operation of worker rewards in conjunction with targets, whereby family planning staff are expected to recruit a, specified number of new clients per month, may lead to methods of persuasion that border on coercion. They conclude that Bangladesh evidence strongly suggested that client payments exceeded the official purpose of compensation costs associated with the procedure and acted; an inducement, particularly for men and the very poor. However, the element of inducement operated only when there was an underlying strong desire to limit family size.

In Asia the amount of payment to the client varies from time to time and from country to country. The table below gives the latest information we have, with payments being expressed in of local currencies, then in GNP Per Capita (which converts local currencies into U.S. based on exchange rates), then in the last column a conversion of local currencies into U. S. dollar based on purchasing power of currencies (PPC) [World Development Report, 1993]. The latter figures are, we believe, a better reflection of the value to clients than are the GNP, PC figures.

Nepal and India have emphasized sterilization very strongly; recently more attention has been given to reversible methods. For example, in Nepal 86 percent of all contraceptive users in 1986 were sterilized, and this fell to 78 percent 1991. We do not have data for India later then1988. The Government of India has indicated that it is emphasizing reversible, methods, but payments to clients for

sterilization, are relatively high, and it is likely that sterilization will continue to be the dominant in India in the years ahead.

Prospects for Fertility Reduction

Table 4: Client Payments for Sterilization Procedures

		US$ Based on:	
Country	**Local Currency**	**Exchange Rates of Currency (GNP Per Capita)**	**Purchasing Power of Commodities (GDP Per Capita)**
Bangladesh	175 tonnes	$5.42	$28.58
India	100 tonnes	7.62	26.55
Nepal	100 tonnes	2.13	9.02
Pakistan	75 tonnes	2.33	11.48
Sri Lanka	600 rupees	13.87	73.51

Table 5: Among Contraceptive Users, Percent Relying on Each Method

Country	**Sterilization**	**Pill**	**IUD**	**Condom**	**Traditional and Other**
Bangladesh	21	39	5	7	28
India	76	3	5	6	10
Nepal	78	4	1	2	13
Pakistan	31	8	8	23	31
Sri Lanka	48	6	3	3	40

We have assessed the likelihood that each of the 37 developing countries with populations of 15 million or more in 1990 will reach replacement fertility by 2015, less than a quarter century from now. The predictions given below cannot Of course take account of extraordinary or cataclysmic events that no one can foresee. They may occur, and they have done so throughout history, but an exercise like this one must be grounded in the more general and pervasive forces that are now ongoing and will clearly persist. Unanticipated events like the collapse of the Soviet Empire, or the near total breakdown of social order in a Zaire or Somalia, cannot be worked into a calculus of demographic predictions (McNicoll, 1992a, 1992b).

Methodology

A country's prospects for substantial fertility decline can be judged by a variety of indicators. In this analysis we have relied principally upon the following five:

1) the socio-economic setting,

2) the past trend of the Total Fertility Rate (TFR)

3) the present level of the TFR,

4) the prevalence of contraceptive use,

5) the strength of effort by large-scale family planning programs.

To merge these indicators into a single Composite Index we located each country within the observed range of variation of each indicator. We then adjusted that range to go from zero to one hundred, so that if a country were at the top of the range on all five it would score 100 on each, and 100 on the resulting index since that is a simple average of the five ranks. We recalculated the index in various ways and found it to be robust against different assumption's such as giving different weights to the five indicator, or omitting one indicator. Such variations only trivial differences in the ranking of the countries; the country positions were essentially undisturbed. Therefore we use here the simplest version, giving equal weights to all five indicators.

Table 6: Correlation Matrix for Indicator's

Variable	**TFR 1985-1990**	**TFR Decline 1960-1965 to 1985-1990**	**Programme Effort Score 1989**	**Prevalence**	**SES**
TFR	0.75				
Programme Effort Score 1989	0.30	0.38			
Prevalence 1990	0.91	0.79	0.32		
SES Index	0.55	0.48	0.04	0.59	
Composite Index	0.92	0.88	0.46	0.94	0.58

The close interrelationships among the indicators and the Composite Index appear in the following correlation matrix (r^2 values). The Composite Index closely follows the TFR, the TFR decline, and the prevalence level. It correlates well with the SES indicator, and appreciably so with the program Effort score. The five indicators themselves are only moderately inter-correlated. The level of program effort is not highly correlated with any of the other variables, and is independent of SES. Contraceptive prevalence is of course, highly correlated with the TFR and with TFR decline.

Fertility clearly responds to contraceptive prevalence (r^2=.90). As noted, both underwent transformations between the early 1960s and the late 1980s, and the relationship between the two is strong both cross-sectionally and over time. A regression on 95 countries using data available as of February 1993 gives the relation TFR = 7.3142 - (0.0704) X (Percent Prevalence). The R^2 is 0.89.

From this formula, contraceptive prevalence of 74 percent leads to replacement fertility, at a TFR of 2.1. This relationship would, of course, change if there were a significant change in the frequency of abortion, in the use of "morning after" pills, or in the average use-effectiveness of contraception. It is also affected to a lesser degree by factors such as natural infecundity and sterility, and accuracy of national estimates.

Results

Our five countries fall across all four categories:

Certain: Sri Lanka

Probable: India

Possible: Bangladesh

Unlikely: Nepal and Pakistan

Sri Lanka ranks high on almost every socio-economic index, and its level of contraceptive use is above 60, having risen an average of 2.5 points annually (Table 7). Our analysis results in classifying Sri Lanka as certain to reach replacement fertility before 2015. As was noted earlier, India ranks very low on almost every socio-economic variable. It has high infant mortality, low literacy, low school enrolment, particularly of girls, and low income per capita. Although India was the first country in the world to articulate a policy to reduce its rate of population growth, it has often been criticized for its heavy focus on sterilization. However, contraceptive prevalence increased from 14 percent in 1970 to 34 percent in 1980, to 45 percent in 1988, and tapered off a bit to a level of 41 per cent in 1992-93; an average of 1.2 percentage points increase per year (Table 7). The social and economic setting of which the program is a part is however daunting: low per capita income ($350), low annual rate of increase from 1960 to 1990 (1.9% per year), relatively low life expectancy (58), high infant mortality (98), low literacy (48%), particularly among women (34%), and low female enrolment in primary and secondary schools (55).

Table 7: Time Trends for Contraceptive Prevalence

	Earliest Date		Latest date		Average Annual Increase in Percentage
	Year	**Prevalence**	**Year**	**Prevalence**	**Points**
Bangladesh	1969	4	1993/94	45	1.67
India	1970	14	1992/93	41	1.20
Nepal	1976	3	1991	23	1.33
Pakistan	1968/69	6	1990/91	12	0.27
Sri Lanka	1975	32	1987	62	2.50

Despite these unfavorable social and economic indicators, the TFR has gradually fallen from about 5.8 in 1960 to below 4, a decrease of more than one third. If that pace of decline were to be continued until 2015, the TFR would be just, under 2.5. There is increased emphasis on the availability of a larger number of effective contraceptive methods; with less emphasis on sterilization. The Government of India has identified 90 districts with high fertility, mostly in the four large northern states, of Bihar, Madhya Pradesh, Rajastan, and Uttar Pradesh (containing 336 million persons in 1991) and it will provide a larger proportion of its resources to these districts.

There has been steady though unspectacular improvement in social and economic factors. If the pace of those changes should increase, and if the family planning program continues to improve, it is possible that India could achieve replacement fertility by 2015.

Bangladesh is more disadvantaged than neighboring India. Its income per capita is lower; its rate of increase in GNP has been smaller; life expectancy is lower; infant mortality is higher; literary, particularly of women, is lower; and enrolment in primary and secondary schools is lower then the low rates of India. Contraceptive prevalence was only 4 percent in 1969, but it increased steadily to 19 percent in 1981, 25 percent in 1985, and 45 percent in 1993-94, an annual average rise of 1.7 points. Its family planning program was weaker than that of India in 1972 and 1982, but by the end of the decade of the 1980s its family planning program was judged to be as strong as that of India, without the extremely strong emphasis on sterilization.

Although social and economic factors in Bangladesh seem incompatible with low fertility, rapid increases have occurred in contraceptive prevalence as the result both of a strong national program and strong efforts of non-governmental organizations (NG0s). A continuation of past trends would lead to a sufficiently high level of contraceptive use to bring about replacement fertility by 2015. This is not highly likely, but is by no means impossible.

Nepal and Pakistan are classified as having essentially no chance of reaching replacement fertility by 2015. Based on past fertility trends both of these countries are likely to continue to have high TFRs for a substantial number of years in the future. Pakistan is among the largest seven developing countries, and is low on nearly every indicator. It has taken steps to strengthen its action program to address rapid growth, but has not yet extended services effectively to the rural population. Nepal is similarly dis-advantaged, and progress in socio-economic variables and in fertility reduction are judged to be low.

The perceptions of many professionals in the field are that Sri Lanka has implemented its program very successfully, that Bangladesh has done extremely well considering its disadvantaged socio-economic situation, that India has not performed as well as many had expected and that Nepal and Pakistan have performed rather poorly. Such perceptions partially reflect objective criteria of program performance, including levels and changes in contraceptive prevalence, and in fertility levels and changes. Ideally, it would be desirable to have objective measures of accessibility of contraceptive services, and quality of reproductive health systems, but there are only limited data on the former, and no systematic measures of the latter.

Sri Lanka's TFR is estimated by the United Nations to be a little under 2.6. India's TFR is probably about 3.7; Bangladesh's TFR is 3.44 according to the 1993-94 sample survey, but a figure of 3.8 is probably more realistic. Nepal's TFR is estimated to be 5. 1. The Pakistan figure is 5.36 according to the 1990-91 Demographic and Health Survey (DHS); whereas the United Nations estimates Pakistan's TFR well above 6. However, detailed examinations of the DHS data have not found evidence of substantial under-reporting.

Conclusion

These South Asian weigh heavily in the future of the developing world as a whole. They include three of the five largest members of that world, and they represent 27 percent of its total population. They have faced, and continue to face, severe difficulties in mounting strong population and family planning programs, and their success in doing so has been mixed. The thirty indices

examined here show uneven efforts, with a number of weak ones. Implementation is a function of the available skills and infrastructures, as well as political will, ministry of health traditions, and other determinants.

Past efforts demonstrate clearly that remarkable progress can be made under these difficult conditions: that contraceptive prevalence can spread throughout a poor, rural population that family size can decline and that overall fertility can fall. If the faster rates of increase for contraceptive prevalence in three of the countries were to continue until 2015, their total fertility rates would probably approach replacement levels. That would go far beyond observer expectations when these programs began and 'would constitute a social revolution, even though the momentum of growth will add many additional millions to the populations to be served.

References

1. Bongaarts, John, W. Parker Mauldin, and James F. Phillips. 1990. "The demographic impact of family planning programs. "Studies in Family Planning 21, 6: 299-310.

2. Boohene, Ester and Thomas E. Dow. Jr. 1987."Contraceptive prevalence and family planning program effort in Zimbabwe". International Family Planning Perspectives 13,1.

3. Camp, Sharon L. and Joseph J. Speidel. 1987. 'Access to birth control: A world assessment. Population Briefing Paper. No.19. Washington. DC: Population Crisis Committee.

4. Cleland, John and Warren Robinson. 1992. "The Use of Payments and Benefits to influence Reproductive Behavior," in J. F. Phillips and J. A. Ross, eds. Family Planning Program and Fertility, Clarendon Press, Oxford.

5. Cleland, John. and W. Parker Mauldin. 1991. 'The Promotion of Family Planning by Financial Payments: The Case of Bangladesh." Studies in Family Planning, 22/1, January/February, pp 1-18.

6. Entwisle, Barbara. 1989. 'Measuring components of family planning program effort.' Demography 26, 1: 53-76.

7. Entwisle, Barbara, William M. Mason, and Albert I. Hermalin. 1986. "Multilevel dependence of contraceptive use on socio-economic

development and family planning program strength." Demography 23, 2: 199-216.

8. Forrest, Jacqueline D. and John A. Ress. 1978. 'Fertility effects of family planning programs: A methodological review.' Social Biology 25: 145-163.

9. Freedman, Ronald and Bernard Berelson. 1976. "The record of family planning programs.' Studies in Family Planning 7, 1: 1-40.

10. Freedman, Ronald and Deborah Freedman. 1991. "The role of family planning programs as a fertility determinant". In Family Planning Programs and Fertility. Eds. James F. Phillips and John A. Ross. Oxford: Oxford University Press.

11. Hernandez, Donald J. 1984. Success or Failure? Family Planning programs in the Third World. Westport: Greenwood Press.

    ----1988. Book review of organizing for Effective Family Planning programs. Eds. Robert J. Lapham and George B.Simmons. Population and Development Review 14, 1: 198-202.

    ----1989. 'Comment. "Demography 26, 1: 77-80.

12. Jain, Anrudh K. 1989. Fertility reduction and the quality of family planning services." Studies in Family Planning 20, 1: 1-16.

13. Lapham, Robert J. and W. Parker Mauldin. 1972. National family planning programs: Review and evaluation. "Studies in Family Planning 3, 3: 29-52.

    ----1984. 'Family Planning program effort and birth-rate decline in developing countries.' International Family Planning Perspectives 10, 4: 109-118.

    ----1985. 'Contraceptive prevalence: The influence of organized family planning programs. "Studies in Family Planning 16, 3: 117-137.

14. Lapham, Robert J. and George B. Simmons (eds.). 1987. Organizing for Effective Family Planning Programs. Washington, DC: National Academy Press.

15. Mauldin, W. Parker and Robert J. Lapham. 1985a. "Conditions of fertility decline in LDCs, 1965-80." Background paper, World Bank, Washington, DC.

----1985b. "Societal influences on family planning program effort.' Paper presented at the IUSSP Seminar on Societal Influences on Family Planning program Performance, Ocho Rios, Jamaica, April 10-13.

16. Mauldin, W. Parker and Bernard Berelson. 1978."Conditions of Fertility Decline in Developing Countries, 1965-75".Studies in Family Planning vol. 9, no. 5, pp. 89-148.

17. Mauldin, W.P. and J.A. Ross. 1991. 'Family Planning program: Efforts and Results, 1982-89." Studies in Family Planning 22(6):350-367.

18. McNicoll, Geoffrey. 1992a. 'The Agenda of Population Studies: A Commentary and complaint." Research Division Working Paper No. 42. New York: The Population Council.

    ----1992b. 'Malthusian Scenarios and Demographic Catastrophes. Research Division Working Paper No. 49. New York: The Population Council.

19. Ness, Gayl D. and Hiro Ando. 1984. The Land is Shrinking: Population Planning in Asia. Baltimore and London: Johns Hopkins University press.

20. Nortman, Dorothy L. 1981. "Measurement of Family Planning program Inputs in Different program Structures.' Population Council Working Paper No. 69. New York: The Population Council.

21. Pohlman, L. 1973. 'Birth Planning Incentives: Psychological Research," in J. Fawcett (ed.) Psychological Perspectives on Population, New York, Basic Books.

22. Ross, J.A. and J.D. Forrest 1978. "The demographic assessment of family planning programs: A bibliographic essay.' Population Index 44(l): 8-27.

23. Ross, J.A. and C. Lloyd. 1992. 'Methods for measuring program impact: A review of applications in the last decade.' In Phillips, J.F. and J.A. Ross (eds.), Family Planning program and Fertility. Oxford University Press.

24. Ross, J.A., J. Wray, A. Rosenfield, and D ' Lauro. 1987. "Community based distribution programs.' Eds. R.J.Lapham and George B. Simmons Washington D.C.: National Academy Press, pp.367-390.

25. Sheon, Amy, William Schellstede, and Bonnie Derr. 1987. "Contraceptive social marketing." In Organizing for Effective Family Planning programs. Eds.

26. Robert J. Lapham and George B. Simmons. Washington, DC: National Academy Press, pp. 367-390.

27. Tsui, Amy Ong and Luis H. Ochoa. 1991. "Service proximity as a determinant of contraceptive behavior: Evidence from cross-national studies." In Family Planning Programs and Fertility. Eds. James F. Phillips and John A. Ross. Oxford: Oxford University Press.

28. United Nations. 1978a. Methods of Measuring the Impact of Family Planning Programs on Fertility: Problems and Issues. Sales no.E.78.XIII.2.New York: United Nations.

----1978b. Manual IX. The Methodology of Measuring the Impact of Family Planning Programs on Fertility. Sales no. E.78.XIII.2. New York: United Nations

----1981. Evaluation of the Impact of Family Planning Programs on Fertility: Sources of Variance. Sales no. E.81.XIII.9. New York: United Nations.

----1985. 'Studies to enhance the evaluation of family planning programs Population Studies, no. 87. ST/ESA/SER.A/87. New York: United Nations.

29. United Nations Population Fund. 1989. Global Population Assistance Report 1982-1988. New York: United Nations Population Fund.

30. World Bank. 1993. World Development Report. New York: Oxford University press.

Appendix A

Summary description of the 30 items included in the family planning program effort scale

Policy and stage setting activities

1. Government's official policy or position concerning fertility/family planning and rates of population growth.

Existence and type of official policy: to reduce the population growth rate, to support family planning activities for other than demographic reasons, to allow

private and/or commercial family planning activities in the absence of government sponsored activity, or to discourage family planning services.

2. Favorable statements by leaders

Whether the head of the government speaks publicly and favorably about family planning at least once or twice a year, and whether other officials also do so.

3. Level of family planning program leadership

Level of the post (person appointed) to direct the national government family planning program, and whether or not the program director reports to the highest level of government.

4. Age-at-marriage policy

Minimum legal age at marriage for females at least 18 years (higher scores for legal ages of 19 and 20+), and the extent of effort to enforce any changes in the law since 1960 regarding legal age at marriage for females. (The score for the latter component is allowed only if the new legal minimum is at least 18.)

5. Import laws and legal regulations regarding contraceptives

Extent to which import laws and legal regulations facilitate the importation of contraceptive supplies that are not manufactured locally, or the extent to which contraceptives are manufactured within the country;

6. Advertising of contraceptives in the mass media allowed

Whether the advertising of contraceptives in the mass media is allowed with no restrictions, whether there are weak restrictions, whether there are social restrictions, or whether there are strong restrictions.

7. Other ministries/government agencies involved

Aside from the ministry or government agency that has primary responsibility for delivering family planning supplies and services, the extent to which other ministries and government agencies assist with family planning and/or other population activities. This involvement or assistance may be provided through the public sector or through private-sector family planning programs or population activities, and is classified as follows: assistance with the delivery of family planning supplies and services, assistance in the form of services particular to that ministry, assistance with family planning information and

education in specific ways, membership on a council for family planning that meets at least twice annually, moral support and small miscellaneous assistance, no assistance.

8. In-country budget for program

Percentage of the total family planning/population budget available from in country sources. A top score is given if in-country sources provide 85 percent or more of the budget; no score is given if these sources provide less than 50 percent of the budget.

II. Service and service-related activities

9. Involvement of private-sector agencies and groups

Extent to which private-sector agencies and groups assist with family planning or other population activities. These groups include family planning associations, and so on. The involvement or assistance with family planning and population activities may include the following: delivery of family planning supplies and services, training, family planning information and education, membership in a family planning interagency group that meets at least twice annually, moral support or other types of assistance.

10. Civil bureaucracy used

Use of the civil bureaucracy of the government to ensure that program directives are carried out, and the extent to which the senior government administrator at the following levels feels responsible for the success of the program: central government level, provincial or state levels, district/governorate/regency/etc. levels, county levels.

11. Community-based distribution (CBD)

Proportion of the country covered by CBD programs for the distribution of contraceptives in areas not easily served by clinics and/or other service points. Public and/or private CBD systems are included. The essential feature of CBD is that the contraceptive supplies are available upon request within the village, local community, or local residence neighborhood. CBD programs are assumed to be primarily rural; however, a partial extra score is allowed for urban CBD programs.

12. Social marketing

Proportion of the country covered by a social marketing program, that is, subsidized contraceptive sales in the commercial sector. The essential feature of social marketing is that contraceptives are sold at low cost, i.e., a (heavily) subsidized price, through channels easily, available to rural or urban residents, such as local shops, pharmacies, or specially created local sales outlets. Some forms of social marketing are called commercial retail sales (CRS) programs. Social marketing programs are assumed to be primarily urban programs; however, an extra score is allowed for rural programs.

13. Postpartum programs

Extent of coverage of new mother's by postpartum programs, which may be hospital or field-based. Most programs are field-based. (1) For hospital-based programs, the score is constructed from the proportion of deliveries in hospitals and maternity centers for which the new mothers are provided a family planning information and education service (by trained female workers), and the proportion of all deliveries in the country that take place in hospitals and maternity centers (often a small proportion). (2) For field-based postpartum programs, the score is constructed from the proportion of women who deliver at home and are offered a family planning information and education service by trained fieldworkers.

14. Home-visiting workers

Proportion of the population covered by a group of workers whose primary task is to visit women in their homes (at least in the rural areas) to talk about family planning and childcare. Account is taken of the population that must be covered by each fieldworker; the score for the proportion of the country covered by fieldworkers is deflated if the average population covered by each home-visiting worker is more than 15, 000.

15. Administrative structure

Whether there is adequate administrative structure and staff at three levels (national, provincial, and country). Adequate means that the administrative structure is sufficient to ensure that plan's developed for each level are carried out, that the administrative structure is capable of recognizing and solving problems that cause low performance, and that cause low performance, and that the administrative structure is able and willing to use existing resources needed to carry out plans for the delivery of family planning supplies and services.

16. Training Programs

Whether there is an adequate training program for each category of staff in the family planning program: administrative staff, physicians, nurses, paraprofessionals, village-level distributor's, fieldworkers/motivator's, staff in other ministries and organization, others. Adequate means that the training provides personnel with the knowledge, information, and skills necessary to carry out their jobs effectively, and that facilities exist to carry out the training. The score is determined by the extent to which the training program, for each category of staff, is very good, moderately good, mediocre or poor, or non-existant.

17 Personnel carry out assigned tasks

Extent to which each category of family planning program staff carries out assigned tasks (task implementation): administrative staff, physicians, nurses, paraprofessionals, village-level distributors, fieldworkers/ motivators, staff in other ministries and organizations, others. The score is determined on the basis of the extent to which each category of staff carries out assigned tasks very well, moderately well, or poorly.

18. Logistics and transport

Extent to which the logistics and transportation systems are sufficient to keep stocks of contraceptive supplies and related equipment available at all service points at all times, at the following levels: central, provincial, county. The score is based on the availability of supplies and equipment: all or almost all of the time, about half to three-quarters of the time, sometimes, or seldom or never.

19. Supervision

Whether there is an adequate system of supervision at all levels. Adequate means that: (a) supervisors exist at all levels of program operations in sufficient numbers to make possible supervisory visits at least once a month at service delivery levels (and quarterly at higher administrative levels): (b) supervisors in fact make such supervision, visits to the work sites of the persons supervised. (c) during these supervisory visits, encouragement, advice, and support are provided to supervised workers, in addition to any, necessary checking of operations and records that assist in the evaluation of worker performance; and (d) supervisors carry through on providing/obtaining supplies and services identified as needed during their visits (or at least make serious attempts to obtain these needed supplies and services).

20. Mass media for information, education, and communications (IEC)

Frequency of mass media messages that provide family planning information, including where family planning services are available, and how much of the country is covered by various types of mass media: newspapers, magazines, radio, television, mobile IEC units (films, etc.), billboards and other outdoor media (buses, etc.), traditional types (puppet shows, folk dances, local theater, etc.), other types. The frequency classifications include: at least once a month, sometimes (about once every 36 months), infrequently (about once a year or less often), never.

21. Incentive s/disincentives

Use of monetary or other incentives for the adoption of family planning. The incentives may be provided to: clients, recruiter's service personnel (including CBD personnel), communities. The disincentives may refer to individuals or to communities, and include regulations or constraints designed to encourage family, planning or small family size.

III. Record keeping and evaluation

22. Record keeping

Whether or not there are record keeping systems for family planning clients at the clinic level, plus a system for the collection and periodic reporting of summary statistics at regional and national levels (that is, numbers of acceptors, supplies distributed, numbers of workers, and so on), and whether or not there is feedback to each reporting unit from regional or national units. The scoring takes into account the existence of good systems as well as their implementation.
Feedback refers to reporting back to lower-level units on a regular basis, with progress measured against some standard, such as acceptance or prevalence targets or trends.

23. Evaluation

Whether or not some or all of the following exist (partial score given for each): regular estimation of prevalence levels and trends (annually or quarterly) using program statistics and estimated continuation rates; measurement every two to four years of family planning prevalence levels and trends using data collection methods that are independent from program statistics (such as contraceptive prevalence studies); implementation of operations research studies designed to help program management understand the program, its problems, and potential improvements; professional staff in an evaluation unit who prepare technically

correct periodic report's on the program, what it has achieved, etc.; professional staff who interpret and summarize, for program management, national and regional population data collected through censuses, vital registration systems, and surveys (these staff may be directly associated with the program or with other institutions); good co-ordination, working relationships, and timely sharing of inform between the evaluation unit and other units in family planning program partial score is also given for the existence of universities or research institutes in the country that carry out demographic research, family planning research, or population research of other kinds.

24. Management use of evaluation findings

Extent to which the program managers (decision-makers) use the research and evaluation findings to improve the program in ways suggested by those findings.

IV. Availability and accessibility of fertility control methods

25. Male sterilization

Whether or not medically adequate voluntary sterilization services for males are legally and openly available, and the percentage of the population that has ready and easy access to such services.

26. Female sterilization

Whether or not medically adequate voluntary sterilization services for females are legally and openly available, and percentage of the percentage of the population that has ready and easy access to such services.

27. Pills and injectables

Percentage of couples of reproductive age who have ready and easy access to pills through programs other then CBD and social marketing programs. Ready and easy access means that the recipient spends no more than an average of two hours per month to obtain contraceptive supplies and services. Easy access also implies that the cost of contraceptive supplies is not burdensome, i.e., to meet this criterion, a one-month supply of contraceptives should cost less than 1 percent of a month's wages. (If the availability of in injectables is higher than that of pills, the data on injectables were used to score this item.)

28. Condom, diaphragm, spermicide

Percentage of couples of reproductive age, who have ready and easy access to condoms, through programs other than CBD and social marketing programs. Ready and easy access is defined as in item 27, above. (If the availability of other conventional contraceptives is greater than that of condoms, the data on those other methods were used to score this item.)

29. IUDs

Percentage of couples of reproductive age who, have ready and easy access to IUDs through programs other than CBD and social marketing programs. Ready and easy access is defied as in item 27.

30. Abortion

Proportion of the population that has ready and easy access to abortion services, whether or not abortions are legal, but excluding in the scoring the availability of abortions carried out only under poor conditions.