DEVELOPMENT CENTRE STUDIES

POPULATION PROGRAMMES AND ECONOMIC AND SOCIAL DEVELOPMENT

by

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DEVELOPMENT CENTRE
OF THE ORGANISATION
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- *to achieve the highest sustainable economic growth and employment and a rising standard of living in Member countries, while maintaining financial stability, and thus to contribute to the world economy;*
- *to contribute to sound economic expansion in Member as well as non-member countries in the process of economic development;*
- *to contribute to the expansion of world trade on a multilateral, non-discriminatory basis in accordance with international obligations.*

The legal personality possessed by the Organisation for European Economic Co-operation continues in the OECD which came into being on 30th September 1961.

The members of OECD are Austria, Belgium, Canada, Denmark, Finland, France, the Federal Republic of Germany, Greece, Iceland, Ireland, Italy, Japan, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States.

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The purpose of the Centre is to bring together the knowledge and experience available in Member countries of both economic development and the formulation and execution of general policies of economic aid; to adapt such knowledge and experience to the actual needs of countries or regions in the process of development and to put the results at the disposal of the countries by appropriate means.

The Centre has a special and autonomous position within the OECD which enables it to enjoy scientific independence in the execution of its task. Nevertheless the Centre can draw upon the experience and knowledge available in the OECD in the development field.

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SUMMARY AND CONCLUSIONS

Three points are developed in Chapter I. The first is that while the underdeveloped countries are demographically heterogeneous in many respects, they have the common characteristic of high rates of population growth. The second point is that their population growth is taking place under widely different economic and social conditions. Finally, the current demographic-economic-social development process is, in terms of the rate of population growth and its timing in development, a new phenomenon which does not have general historical precedents.

Chapter II reviews studies concerned with the effects of population growth upon economic and social development. Theoretical and empirical analyses show that fertility reduction is not a prerequisite for economic development and that constant high fertility is not an absolute barrier. These studies demonstrate, however, that the changes in economic growth parameters, which are required to offset the disadvantage of constant fertility and rapid population growth, increase significantly the difficulty of the development task. A reduction in fertility can make an important contribution to development, especially in the longer run period after 15-20 years.

Original research reported in Chapter II shows that because the effects of a demographic event are not fully worked out for very long periods, often exceeding 50 years, long lead times are required in population policy. Satisfactory current levels of economic performance cannot, therefore, be used as criteria for ruling out the existence of a "population problem".

From other original research in this chapter, the conclusion is reached that the argument that larger populations are desirable as a means of increasing the size of the domestic market is inadequate since it neglects the very important per capita income dimension. It is found that a slowing of the population growth rate produces a more developed economic structure in that the agricultural sector is relatively smaller and the industrial and transportation and

communication sectors are relatively larger. One importance of this is that it is these latter sectors which are most characterised by economies of size, or the economic advantages associated with large markets and, therefore, large scale production.

The conclusion also emerges that the education problems, as the economic development problems, cannot be eliminated by a reduction in fertility, but can be made substantially easier. Considerable improvement can be received in exchange for moderated rates of population expansion. Similar statements are valid for health and housing.

Chapter III discusses the response to the population problems. Today some thirty governments in the developing world have adopted family planning as an official state-supported policy. In some other thirty less developed countries, the authorities accept the family planning work carried out by voluntary groups. If Mainland China is included, roughly 90 per cent of the Asian population live in countries with established family planning policies and service programmes, while corresponding figures for Africa and Latin America amount to between 20 and 25 per cent.

One outstanding feature of the financing of these programmes is the high proportion of foreign assistance; figures around or above 50 per cent are not uncommon. Foreign aid in population/family planning has increased rapidly in the past few years from some US. $5 million in 1962 to some US. $95 million committed in 1969. A parallel increase can be seen in the number of sources of aid.

External assistance will continue to play an important role; research must be undertaken to increase our understanding of the population factor and its impact upon development; an effective, attractive, safe, and cheap contraceptive must be developed; training institutions must be built in those countries where action is to take place; programme evaluation must be intensified; methods must be explored, whereby traditional cultural patterns can be adapted to the demands of modern society; maternal and child health must be improved. The absorptive capacity of the national programmes must be increased. A first important step may be for donors to expand the family planning concept to cover more than birth control aspects. Family planning programmes must find new ways of reaching out to people, and international support for such programmes should be accorded within a general context of development co-operation.

Chapter IV presents an estimate of the growth in the numbers of potentially fecund contraceptors which can be attributed to the

institutionalised family planning activity from 1964 through 1968. A rapid growth has occurred during the period but there are a number of forces at work which will tend to increase the inputs which are required to maintain a given level of impact. A review of contraceptive research does not indicate an impending breakthrough in this area which might change the above evaluation.

Chapter V concludes the report with a brief exploration of the frontiers of current debate on the wider issues involved in the population question.

Chapter I

CURRENT DEMOGRAPHIC SITUATION IN DEVELOPING COUNTRIES

Three points emerge from the following review of the demographic situation in the underdeveloped countries. These are: first, the underdeveloped countries are demographically heterogeneous; second, their populations are increasing rapidly but under widely different economic and social conditions; and third, the current demographic-economic-social development process is a new phenomenon which does not have general historical precedents.

Demographic Heterogeneity

Fertility and mortality are the central demographic determinants in a country. The underdeveloped countries evidence substantial differences in the level and trend of these vital rates. The range is from conditions of high fertility and high mortality such as in Dahomey (with a birth rate of 54 births per year per 1,000 population and a death rate estimated between 26 and 31 deaths per year per 1,000 population), through conditions of high fertility and falling mortality such as in the Dominican Republic (49 and 15), and high fertility and low mortality such as in Paraguay (45 and 11), to falling fertility and low mortality such as in Taiwan (29 and 6) and Singapore (27 and 5).

If we allocate the underdeveloped countries into these four classifications, the resulting population distribution is as appears in Table I.1.

The bulk of the African and Asian population lies in category 2 - high fertility and falling mortality - while three-fifths of the population of Latin America falls in category 3 - high fertility and low mortality.

Table I.1

DEMOGRAPHIC CLASSIFICATION OF UNDERDEVELOPED COUNTRIES
TOTAL AND PERCENTAGE POPULATION

Classification (1)		Location					
		Africa Total		Asia (2) Total		Latin America Total	
Fertility per 000 pop.	Mortality per 000 pop.	in mill.	%	in mill.	%	in mill.	%
1. 40 and +	30 and +	33.3	12.5	27.0	2.6	0.0	0.0
2. 40 and +	15-30	218.8	82.2	869.0	84.1	23.3	12.7
3. 40 and +	Less than 15	13.3	5.0	73.6	7.1	111.0	60.6
4. Falling	Less than 15	0.8	0.3	63.4	6.1	48.8	26.7

(1) Southern Yemen, Malaysia, North Korea, Brazil and Gabon fall outside this classification system.

(2) Excluding Mainland China.

Note: Incomplete birth and death data for 11 African countries having a population totalling 65 million, and 9 Asian countries with a population totalling 86.3 million had to be excluded from the classification.

Source: 1969 World Population Data Sheet, Population Reference Bureau.

The generally high fertility in all four categories does produce one common characteristic which has importance for social and economic development, namely a very young age structure. Fertility is the primary determinant of age structure and high fertility produces young populations in which 38-48 per cent are age 15 or under and in which 15-20 per cent are age 5 or under. In many of these countries this structural characteristic has been intensified by recent falls in mortality since they are concentrated in the young-age groups. The effect may be a rise in the percentage 15 years of age and under to levels as high as 50 per cent.

A high rate of population growth is a second common characteristic which emerges despite the diversity in birth and death rates. Table II.2 shows that rates of 2.0 per cent to 3.5 per cent per year are found in almost all countries and regions. This generalisation is true even in those cases in which fertility has begun to fall, for example, Taiwan has a growth rate of 2.3 per cent per year,

Table I.2

CURRENT POPULATION, SOCIAL, AND ECONOMIC GROWTH
Selected Underdeveloped Countries, Recent Years

Location	Annual Rate of Growth		Per cent Output	Per cent Labour Force			Per cent Pop. 15 and over
	Population 1969	Per Capita Income 1957-59 to 1964-66	Agriculture	Agriculture		Industry ILO	Illiterate
			1960	FAO	ILO		1960
N. Africa	2.9	1.3					
Morocco	3.0	.2	32.3	54	56.3(1)	11.4	86.2
S. Africa	2.4	1.8					
Mozambique	1.2	2.9	25.1	69	75.3	6.0	-
Nigeria	2.5	3.2	61.3	80	-	-	-
Uganda	2.5	1.2	61.3	89	-	-	74.9(2)
Sudan	3.0	1.7	57.1	78	85.8	5.6	88.0
Cen. America	3.1	2.6					
Dominican Rep.	3.4	-.6	26.6	57	61.4	11.4	35.5
El Salvador	3.3	2.5	32.3	59	-	-	51.0
Panama	3.2	4.2	22.9	43	46.2(1)	12.5	26.7
S. America	2.7	1.4					
Bolivia	2.4	2.8	28.9	65	63.4	20.7	67.9(3)
Brazil	2.8	1.9	27.8	52	51.6	24.8	39.3(4)
Chile	2.3	2.3	11.1	26	27.7	28.3	16.4
Colombia	3.4	1.4	34.6	47	47.2	19.0	37.7(5)
Peru	3.1	3.5	25.4	47	49.7	19.0	39.4(6)
Mid E. Asia	2.9	4.6(7)					
Iran	3.1	3.7	32.1	57	46.9	24.8	87.2
Iraq	2.5	4.2	18.7	50	47.9	14.8	85.5
S. Asia	2.6	1.9					
Burma	2.2	1.5	31.8	62	-	-	30.1(8)
India	2.5	1.7	51.4	70	72.9	11.4	72.2
Pakistan	3.3	2.8	53.0	74	68.8	10.5	81.2
Far E. Asia	2.8	2.7					
Indonesia	2.4	-	52.0	66	68.0(1)	6.5	57.1
S. Korea	2.8	3.2	32.7	54	51.8(1)	15.1	29.4
Malaysia	3.1	2.8	37.9(9)	55(1)	51.4(9)	10.5	53.0(10)
Philippines	3.5	.9	32.3	57	60.5(1)	12.3	28.1
Thailand	3.1	4.2	38.9	78	82.0	4.2	32.3

(1) Excludes significant unemployment in sector allocation. (2) African population. (3) 1950. (4) Population 10 and over. (5) 1951. (6) Population 17 and over. (7) Excluding Israel. (8) 1953. (9) West Malaysia. (10) West Malaysia excluding European population.

Sources:

Column 1 - 1969 World Population Data Sheet. Population Reference Bureau, Washington D.C.
Columns 2 and 3 - National Accounts of Less Developed Countries, Development Centre, Organisation for Economic Co-operation and Development, Paris, July 1968.
Column 4 - 1967 Production Yearbook, Volume 21, Food and Agriculture Organisation of the United Nations, Rome.
Columns 5 and 6 - 1968 Yearbook of Labour Statistics, 28th issue, International Labour Office, Geneva.
Column 7 - World Literacy at Mid-Century, UNESCO, Monographs on Fundamental Education, Paris, 1957.

Mauritius 2.1 per cent, Chile 2.3 per cent and Singapore 2.2 per cent. The generalisation is less true for countries still suffering from very high mortality such as Chad with a population growth rate of only 1.4 per cent, Central African Republic 1.8 per cent and Mozambique 1.1 per cent, but these countries can anticipate an increase in these rates as reductions in mortality are achieved.

Economic and Social Heterogeneity

The next point to be emphasised is the heterogeneity in the economic and social conditions under which the rapid population increase is occurring.

An examination of Table I.2, which contains several social and economic development variables, indicates this diversity. Rapid rates of population growth are found in association with high rates of increase in per capita income, e.g. in Panama, Thailand and Iraq and with low rates as in Morocco, the Dominican Republic and the Philippines. They are associated with relatively agricultural economies, e.g., India and Uganda, and with economies, e.g. Chile and Iran, which have moved much further toward industrialisation. Wide differences also appear in social development, where for example, literacy varies from low levels in Morocco and Sudan to high levels in Chile and in the Philippines.

In addition, dissimilar patterns or combinations of conditions exist. If we arbitrarily distinguish between high and low rates of growth of per capita income, high and low levels of literacy and high and low dependence upon agriculture we have a 2 x 2 x 2 categorisation.

It is possible from the countries listed in Table I.2 to represent seven of the eight possibilities. For example, both Panama and South Korea exemplify the category with high rates of growth of per capita income, low illiteracy and a relatively low dependency upon agriculture. Thailand, Nigeria, Colombia, Uganda, Morocco and the Philippines can be allocated to the remaining six cases. The conclusion is that the current high rates of population growth are occurring under a variety of economic and social conditions in the underdeveloped countries.

Current Population Growth Rates are Historically Unprecedented

The point that population growth rates of the magnitude of 2 - 3.5 per cent per year are unprecedented historically needs to

be appreciated. World population grew very slowly in the interval AD 1 - 1750. It required more than a thousand years to double as compared to the 35 years it takes at a 2.0 per cent rate. It is not possible to determine exactly the date when the rate accelerated, but by 1750, population was growing at approximately 0.5 per cent per year, a rate that yields a doubling time of some 150 years.

During the eighteenth and early nineteenth centuries an approximately simultaneous up-turn in the rate occurred in most regions of the world. (An exception was China which saw a decline in its rate from 1800 - 1900. Since the Chinese population weights large, the world rate for this period is dampened and the accelerating growth elsewhere masked). The up-turn of this period is documented for Europe in Table I.3 which shows an acceleration to 0.9 per cent in the decade 1820 - 1930 followed by a subsequent fall, and finally a re-acceleration to the neighbourhood of 1.0 per cent for the period 1880 - 1910. Higher and more sustained rates occurred in Eastern Europe where the rate reached 1.0 per cent by 1860 - 1870, a peak of 1.5 per cent in 1900 - 1910, and a sustained rate in excess of 1.0 per cent for five consecutive decades, 1860 - 1910. Maximum rates in individual Western European countries were in the 1.2 per cent - 1.4 per cent per year range as may be seen in the final column of Table I.4.

The only historical cases in which population grew in now developed countries at rates comparable to the current situation were in the open countries of migratory settlement, the United States, Canada, Australia and New Zealand. Here, rates of population growth close to 3.0 per cent were obtained. The experience of these countries, however, has limited current relevance even for today's open countries which have large potential agricultural resources. This limited relevance is due to the fact that the population dynamics of natural and migratory increase are very different. This difference is especially obvious in relation to age structure which is weighted toward the younger ages under conditions of rapid natural increase and toward the middle, productive, ages under conditions of migratory increase because of the predominance of adult migrants.

The conclusion which follows is that the underdeveloped countries today are facing their development task under demographic conditions which are substantially different from those which prevailed in the great majority of the now developed countries. It is our opinion that this difference is not merely a difference in

Table I.3

THE RATE OF POPULATION GROWTH IN EUROPE
Average Annual Rate of Increase in Per Cent

Individual Countries
Early Dates

England and Wales 1701-41:0.013 1741-77:0.456	Sweden 1700-48:0.362 1748-70:0.664	Norway 1935-50:0.216 1750-70:0.805	Finland 1750-70:1.434
France 1701-70:0.184	Prussia 1748-70:0.844	Russia 1721-63:0.730	Austria 1754-84:0.862

Period	All Europe	North-west Europe	Eastern Europe
1770-1800	0.682	...	...
1800-1810	0.603	0.626	0.794
1810-1820	0.703	0.864	0.766
1820-1830	0.942	1.142	0.940
1830-1840	0.706	0.818	0.726
1840-1850	0.581	0.606	0.629
1850-1860	0.620	0.655	0.734
1860-1870	0.769	0.755	1.024
1870-1880	0.831	0.977	1.011
1880-1890	0.901	0.811	1.292
1890-1900	0.992	1.105	1.252
1900-1910	1.114	1.106	1.482
1910-1920	0.219	0.272	0.172
1920-1930	1.025	0.635	1.519
1800-1850	0.707	0.811	0.771
1850-1900	0.823	0.861	1.062
1900-1930	0.785	0.671	1.056

Source: A.M. Carr-Saunders, World Population: Past Growth and Present Trends, Frank Cass & Co.,Ltd., London, 1964, p.21.

degree but a difference in kind. This point may be seen by a comparison between the historical European and the current situation in the time required to double the population. The maximum European rate of 1.1 per cent (Table I.2) was capable of doubling the population in 61.2 years. The maximum individual country rate of 1.4 per cent could double it in 49.9 years. The commonly experienced rate in the underdeveloped countries of 3 per cent doubles the population in only 23.5 years. These are differences of 2 to almost 3 times. Furthermore, a reduction of .5 percentage points from the maximum European rate of 1.5 per cent extends the doubling time by 23.1 years (from 46.6 to 69.7 years) while a similar reduction from 3.0 per cent to 2.5 per cent stretches the doubling time by only 4.6 years. This is a difference of 5 times.

Another way of appreciating the disparity between historic and current experience is to ask what the world population would be today if it had grown from 1900 at the rate currently prevailing in the underdeveloped countries rather than at the lower actual rate. If, starting in 1900 with a population total estimated at 1,650 million, it had increased at 2.3 per cent per year (the current rate for underdeveloped countries) until the present, the total population of the world would now be 7.93 billion. This represents a population more than 2.3 times what it actually is (3.55 billion) and 0.4 billion more than the highest U.N. projections (constant fertility, falling mortality projections) for the year 2000.

A final aspect of the relevancy of historical demographic experience may be seen from a comparison between the timing of economic development and the period of most rapid population increase. Considerable diversity in economic and social development is apparent in the European case as well as in the current situation for the underdeveloped countries. (Table I.4 may be used to examine this point). It appears that over the 19th century, Western European countries evidenced growth rates in per capita income which ranged from rates as high as 3.0 per cent per year in Germany 1875 - 1890 to as low as 1.5 in Sweden 1870 - 1880 and 1.0 or less in Italy 1860 - 1890. Differences in literacy levels are also apparent as are dissimilarities in economic structure. Regarding the latter point it may be noted that in 1870 the percentage employed in agriculture was 19 in Great Britain, 43 in France, and 62 in Italy. While these dissimilarities existed, it is clear that by the time population growth reached its maximum rate after 1880, the level of economic, social and political development was considerably more advanced than is the case in most underdeveloped countries today.

.21.

Table I.4

SOCIAL AND ECONOMIC GROWTH

	Per Cent Illiterate		Rostow's Economic Take-off Dates	Annual Growth Rate of Per Capita Income	Economic Structure, Per Cent of Active Males in Agriculture	Maximum Population Growth Rate
1850-1900	1881	1891				
W. Europe						
Belgium	30.6(1)	25.5(1)	1833-60		31.0 (1880)	=1.0
Great Britain	13.5(2)	6.4(2)	1783-1802	2.1 (1880-85) 2.0 (1890-95) 1.8 (1885-90) 1.7 (1895-1900) 1.1 (1883-88)	31.4 (1841) 17.2 (1881)	1.2 (1781-1820) 1.2 (1891-1900)
France	19.0(2)	10.5(2)	1830-60		51.0 (1872)	= .7
Italy	59.1(2)	50.1(2)		-.3 (1888-93)	51.0 (1870)(3)	1.1 (1891-1900)
Germany			1850-73	3.3 (1880-90) 1.5 (1890-95) 1.5 (1883-88)	41.6 (1883)	1.4 (1891-1900)
Denmark				2.3 (1893-95) 1.6 (1883-88)	51.0 (1870)(3)	1.2 (1891-1911)
Sweden			1868-90	2.9 (1893-98)	49.6 (1880)(4)	1.1 (1781-1820) (1891-1900)
E. Europe						
Rumania	78.0 (1900-10)				72.0 (1930)	
Bulgaria	73.6 (1900-10)				67.0 (1910)	
Hungary				1.4 (1900-12)	59.0 (1900)	
Asia						
Japan			1878-1900	3.1 (1882-87) 3.9 (1887-92)	63.0 (1878-82)	

(1) Census Population age 10 and above. (2) Marriage Data. (3) Per cent employed in agriculture.
(4) Per cent total population dependent on agriculture.

Sources: Column 1. World Literacy at Mid-Century, UNESCO Monographs on Fundamental Education, Paris,1957.
Column 2. Walt. Rostow, The Stages of Economic Growth - A Non-Communist Manifesto, Cambridge University Press, 1961, p.162.
Columns 3, 4, 5. Simon Kuznets, "Quantitative Aspects of Economic Growth of Nations, II Industrial Distribution of National Product and Labour Force". Economic Development & Cultural Change, Vol.V, No.4, July 1967. Simon Kuznets, Modern Economic Growth: Rate Structure and Spread, Yale University Press, New Haven, 1966.
Column 4. Wilber Moore, Economic Demography of Eastern and Southern Europe, *League of Nations*, Geneva, 1945.

We may summarise the principal conclusions of this Chapter in three statements. It is a mistake to think that the demographic situation is similar in all underdeveloped countries. It is an error to conclude that the demographic dynamics to which these countries are subject are occurring under essentially identical social and economic conditions. Finally, it is misleading to believe that the current demographic-economic-social development process has general historical precedents.

Chapter II

THE POPULATION VARIABLE IN SOCIAL AND ECONOMIC DEVELOPMENT

In this chapter we will look at the role of population in the social and economic growth process. We review recent studies which examine its impact upon economic growth and per capita income over time,(1) its influence on the evolution of economic structure, and its role in the solution of education, health and housing problems.

The Impact of Population upon National Economic Development

Theoretical and empirical analysis of the effects of rapid population growth upon the performance of the total economy show that a reduction in fertility can make significant contributions to the development process. These contributions become increasingly important after 15 to 20 years.

A number of economic growth models have been designed to explore the effects of different demographic conditions - especially different trends of fertility - upon economic development and per capita income. Several of these models relate to particular countries in recognition of the demographic, economic and social diversity emphasised in the preceding chapter.

In conception the models are more or less similar, all are dynamic simulation models in which various predetermined population projections work through capital-output ratios or production functions to yield output projections. The models do, however, differ in the number of parameters through which population affects

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(1) The reader may wish to consult the Development Centre study, Goran Ohlin, Population Control and Economic Development, Development Centre, OECD, Paris, 1967.

the growth process, the level of disaggregation, and the conceptualisation of the behavioural relationships. Generally speaking, population is visualised as influencing economic growth through its effect upon the basic economic inputs of land, labour and capital. The supply of utilised agricultural land is influenced by the pressure of population upon the extensive land margin. The level and growth of employment is affected from both the supply and demand side. From the supply side, it is influenced by the size and growth of the population, and from the demand side by the level of employment-generating investment in the non-agricultural sector and by the supply of land in the agricultural sector. Investment is, in turn, affected by the impact of population upon the saving-consumption decisions of households, governments and business. In addition, population is seen to play a part in shaping the composition of investment via its role in determining the alternative demands for investment in, e.g. schools, houses or directly productive equipment. It also enters the development equation through the rate of technological change.

Table II.1 of this chapter presents the results of these models in terms of per capita percentage advantage of reducing fertility compared with constant fertility. The table shows that the results derived from the various models are quite consistent. The advantage of fertility reduction amounts to a per capita income advantage of approximately 3-5 per cent after 10 years, 15-25 per cent after 20 years, and 25-50 per cent after 30 years, thus demonstrating that it is an important development variable. The table also demonstrates the point that the economic impact is more a long-run than a short-run phenomenon.

Since the economic impact is relatively small in the short-run and since economic development plans are also short-run, usually five years or less, a tendency exists to dismiss population considerations and fertility control measures as unimportant in economic planning. The danger is, however, that as short-run periods follow one another, the long-run is entered without ever having considered population which is an important long-run growth variable.

The contributions to per capita income of a reduced rate of population growth can be seen from Figure II.1 which contrasts the time trend of per capita income under three sets of parameter conditions representing different levels of economic "success". Case 1 is the pattern forthcoming when economic and social parameters are "unfavourable for sustained growth", case 2 is a pattern

Table II.1

POPULATION - ECONOMIC GROWTH MODEL COMPARISON

Per capita income under declining fertility in comparison to that under constant high fertility, various time periods

Model	Country	Percentage ratio of per capita income of declining fertility case to high fertility case after		
		10 years (1)	20 years (1)	30 years (1)
Coale & Hoover	India	103	113-116	138-148
Hoover & Perlman	Pakistan		114-120	
Ruprecht	Philippines	104-105	117-132	135-193
Newman & Allen	Nicaragua	105	115	125
Enke ("Fewer Births")	General	109	119	129
		15 years		
(Tempo)	General	111		136

(1) Range in ratios produced by alternative parameter values, e.g. saving propensities, levels of autonomous growth element, etc.

Sources: Ansley J. Coale and Edgar M. Hoover. Population Growth and Economic Development in Low-Income Countries, Princeton University Press, Princeton, 1958.

Edgar M. Hoover and Mark Perlman, "Measuring the Effects of Population Control on Economic Development: Pakistan as a Case Study", Pakistan Development Review, Vol.6, No.4, Winter 1966, pp.545-566.

Theodore K. Ruprecht, Population and Economic Development in the Philippines, unpublished.

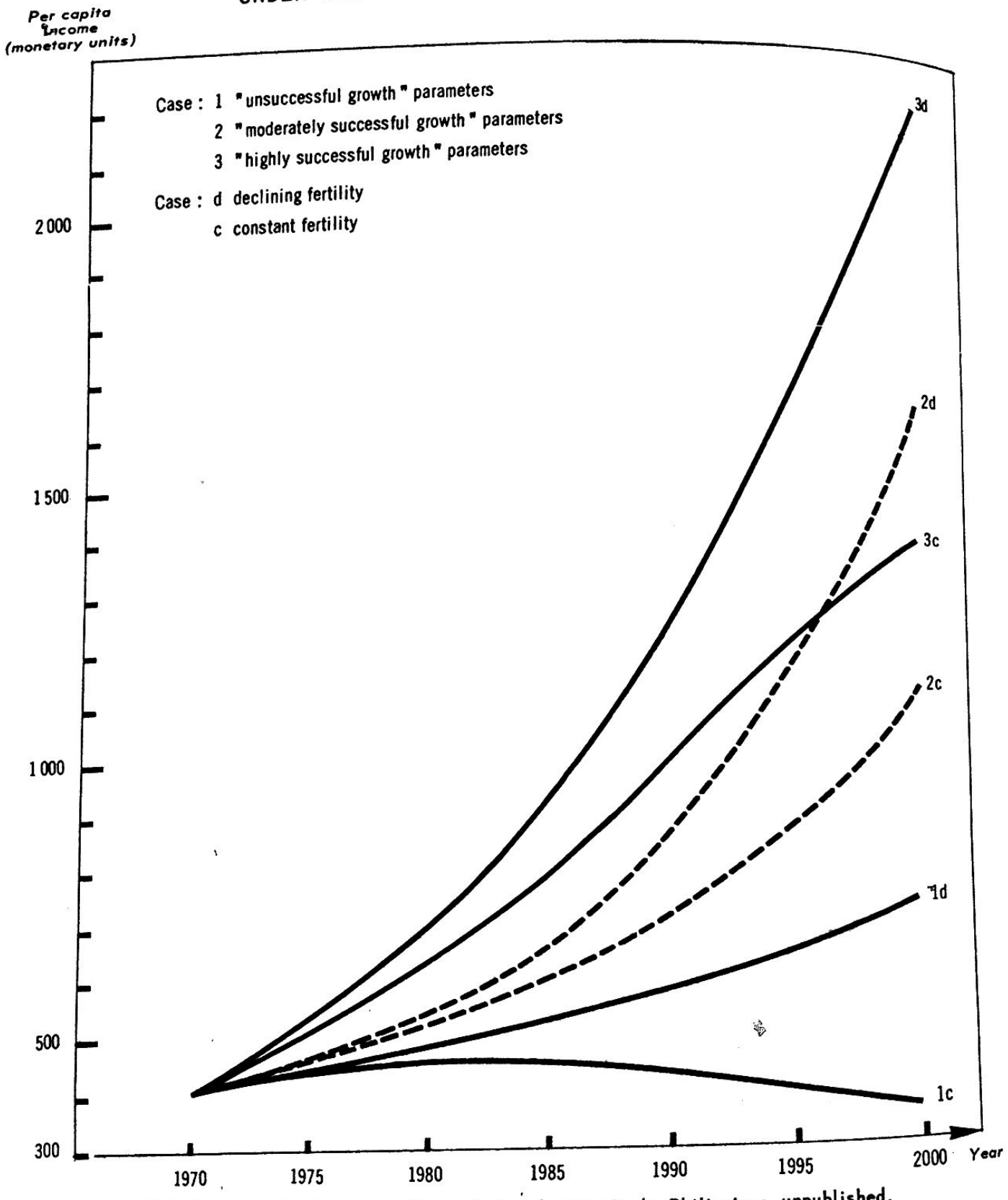
Peter Newman and R.H. Allen, Population Growth and Economic Development in Nicaragua, Robert R. Nathan Associates,Inc., Washington, D.C., 1967.

Stephen Enke, Raising Per Capita Income through Fewer Births, TEMPO, General Electric Company, Santa Barbara, Calif., March 1967.

Population Growth and Economic Development Background and Guide, prepared for the Agency for International Development by TEMPO, General Electric's Center for Advanced Studies, Santa Barbara, California.

Figure II.1

POPULATION AND ECONOMIC GROWTH : THREE POSSIBLE ECONOMIC GROWTH PATTERNS UNDER DECLINING AND CONSTANT FERTILITY



Source : T.K. Ruprecht, *Population and Economic Development in the Philippines*, unpublished.

of "moderately successful growth", and case 3 is a pattern of "highly successful growth". In all three cases the "c" and "d" versions differentiate the "constant" and "declining" fertility situations respectively.

All three cases in Figure II.1 illustrate the point that a reduction in fertility makes an important contribution to improvements in material welfare. It can also be observed that the per capita income advantage is quite constant at all three levels of economic performance. That is to say, the relative income advantage of reducing fertility is approximately the same over a very wide range of economic growth conditions. This is an important conclusion because it shows that "successful" economic growth does not weaken the argument for controlling fertility since it does not seriously reduce the economic advantage involved.

Cases 2 and 3 demonstrate that fertility reduction is neither a prerequisite nor is constant high fertility an absolute barrier to economic development. Sustained economic growth can be achieved in the face of rapid population increase, cases 2c and 3c, when other economic growth parameters are sufficiently favourable to offset the disadvantage of constant fertility and rapid population growth.

Fertility Decline is Important

It is possible to gain some idea of the extent to which these other growth parameters must be changed in order to offset the disadvantages of unmodified fertility.(1) In the Philippine study, which allows for variations in the largest number of these parameters, the following list of changes were found to be individually insufficient to offset the effects of constant fertility:

(1) an increase in savings of 15 per cent for households, 5 per cent for government and 19 per cent for business;
(2) a reduction by 2/3 in the decline in the employment generating ability of investment;
(3) a doubling from 1 to 2 per cent per year in the rate of

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(1) See Simon Kuznets, "Population and Economic Growth", Proceedings of the American Philosophical Society, Vol.III, No.3, June 1967, for the view that relatively slight modifications in the savings-investment rate are sufficient to offset the detrimental growth effects of unchecked population increase. Kuznets' conclusion is based upon a much simpler model than that which is here reported.

productivity increase in the non-agricultural sector; and (4) an increase in exports capable of providing 0.7 points of the annual required growth rate in agriculture.

Even certain combinations were insufficient, namely, an increase in savings combined with the change in the employment coefficient and the increase in non-agricultural productivity combined with the change in employment. Only an increase in agricultural productivity from a ceiling of 1.0 per cent per year to 2.5 per cent per year was sufficient on an individual basis. A number of combinations, such as increased savings and the export boost, increased savings and non-agricultural productivity, and an increase in non-agricultural productivity combined with the export boost, proved more than sufficient to offset the disadvantage of undisciplined fertility.

The point is that it is possible to offset the cost (in terms of foregone potential per capita income) of rapid population growth by achieving more favourable economic growth parameters, but only at the price of intensifying the already difficult development task. This is true since rapid population expansion does not aid in achieving the more favourable parameter values, except perhaps the rate of development and acceptance of improved agricultural technology. In fact, it hinders their achievement by, for example, increasing the pressure of consumption upon household incomes and thus savings. Thus, the failure to reduce fertility either results in a loss of per capita income in the opportunity sense given above or, if this is compensated, it results in an increase in the required development effort.

The situation depicted in Figure II.1 by case 1, the case of "unsuccessful growth", is an especially interesting one. It is the situation in which the values of the growth determining coefficients are not sufficient for sustained economic development in the face of unchecked population increase. The crucial role of fertility reduction in this case can easily be appreciated since it can reverse a case of economic deterioration.

It can also be noted that in case 1c, the case of constant fertility, per capita income rises in the initial few periods before the full retarding effect of the accumulating population burden takes hold. It would be unfortunate if this period of rising per capita income was interpreted as a sign that a population problem did not exist, since the economic deterioration of the later periods is entirely due to the "population problem" of the

initial periods as can be seen by the continued growth of the reduced fertility alternative (1d). If fertility reduction is delayed until the onset of economic stagnation or deterioration, the rapid population growth which has occurred will have built into the population such a growth momentum that the reversal of the economic trend by fertility control or other means will be extremely difficult. The lesson is that fertility control must have a long lead time over the emergence of a "population problem".

This point, in combination with the earlier point, that the pay-off to fertility reduction is appreciable only in the longer run, means that considerable foresight and early planning is required. The necessity to consider fertility reduction before the acceleration of population has strangled economic growth, i.e. while per capita incomes are still rising and the economy apparently still doing well, and in anticipation of important per capita income differentials only after a lag of 20 years or so, requires the kind of forward looking, enlightened and stable leadership which is often in such short supply.

The Importance of Time in Achieving Fertility Reduction

Since the time factor is important and too little appreciated, we have undertaken a research project to quantify the future effects of delayed fertility reduction.(1) We have done this through a series of alternative population projections. These projections are made under a single assumption concerning the decline in mortality and eight assumptions concerning the timing of fertility decline. These assumptions are: no decline, a decline beginning 5 years after the decline in mortality, and the decline beginning after 10, 15, 20, 25, 30 and 35 years.

The projections are set up in order to compare a 0, 5, 10 and 15 year lag in the current "African" case of a short history of mortality fall and a 0, 5, 10 and 15 year lag in the current "Asian" case of 20 years of past mortality decline. Our findings in the "African" case for population size, number of births, the number of females in the reproductive ages 15-44, and male labour force entrants ages 15-19 are presented in the following Table II.2. The entries in Table II.2 are the percentages by which the

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(1) cf. Goran Ohlin, Population Control and Economic Development, Development Centre of the Organisation for Economic Co-operation and Development, Paris 1967, Annex Chapter VIII, pp. 121-122.

Table II.2

DEMOGRAPHIC EFFECTS OF DELAYED FERTILITY RESPONSE TO MORTALITY DECLINE

Number of years after time zero fertility decline	Short History of Mortality Decline											
	Population			Births			Females in Reproductive Ages 15-44			Male Labour Force Entries Ages 15-19		
	Years after time 0			Years after time 0			Years after time 0			Years after time 0		
	10	30	50	10	30	50	10	30	50	10	30	50
	Per cent by which the projection with given year lag exceeds the variable in the zero year lag.											
5 years	1.3	7.1	9.8	7.6	14.9	13.9	0.0	4.1	13.5	0.0	11.5	12.0
10 years	1.5	12.4	18.6	9.5	33.1	24.2	0.0	6.3	12.5	0.0	20.5	29.6
15 years	1.5	19.4	30.7	9.5	58.5	43.5	0.0	6.6	40.2	0.0	22.1	49.7
	Long History of Mortality Decline											
	Years after time 0			Years after time 0			Years after time 0			Years after time 0		
	10	30	45	10	30	50	10	30	45	10	30	45
	Per cent by which the projection with given year lag exceeds the variable in the zero year lag.											
5 years	3.0	8.5	10.4	17.5	13.7	15.6	0.0	7.8	14.6	0.0	19.4	13.7
10 years	3.6	16.6	20.5	21.8	30.6	32.8	0.0	12.5	28.5	0.0	39.4	30.6
15 years	3.6	24.3	31.0	21.8	52.3	49.3	0.0	13.5	41.8	0.0	44.8	52.3

numbers in the different fertility lag projections exceed the corresponding numbers in the immediate (0 lag) fertility decline projection. For example, the first figure of 1.3 says that ten years from "now", time zero, the population will be 1.3 per cent larger if the reduction in fertility begins in five years rather than now. In 30 years it will be 7.1 per cent larger and in 50 years it will be 9.8 per cent larger. Thus, 1.3, 7.1 and 9.8 per cent are the costs, over time, in terms of larger total population, of waiting an initial 5 years for the beginning of fertility decline. The second row records the percentage difference from a 10 year wait - and via subtraction yields the costs of a second 5 year wait. The third row shows the effects of a 15 year wait.

For births, the table shows, for example, that after 30 years, 33.1 per cent more births will occur that year if the decline in fertility is delayed 10 years, than would have occurred if the decline were not postponed. In absolute numbers this amounts to a difference of 63.6 thousand births, 255.7 thousand births in a population of 1.7 million compared to 192.1 thousand births in a population of 1.6 million. The beginning population was assumed to be 1.0 million. The section of the table dealing with the number of females in the reproductive ages is important since it shows how postponed family planning builds into the population large numbers of eventual mothers. The final panel demonstrates the increased magnitude of the employment task imposed by delayed fertility response. A ten year lag implies that instead of having to find 78.1 thousand new jobs in thirty years for those entering the labour force, 94.1 thousand or 20.5 per cent more, must be found. In fifty years the numbers are 80.3 thousand and 104.1 thousand.

The calculations for the "Asian" case, in which mortality has declined for 20 years, show a similar pattern but larger percentage differences. This latter situation is due to the momentum effect of past mortality achievements and shows up despite the more rapid fall in fertility which has been assumed. The conclusion that the "costs of waiting" in the "Asian" situation are higher than in the "African" situation is consistent with the fact that family planning programmes first emerged in Asia.

The implications of delayed fertility response for subsequent family planning activity was a corollary aspect of the research. Our approach was to ask the question: "If a delay in fertility of a given length has occurred, and at that later date it is recognised that this delay was a mistake, how much of a reduction

in births is necessary in order to yield the same number of births as would have taken place in the absence of a fertility lag?" In general terms, "what is the 'cost' of having failed to achieve an immediate fertility reduction in terms of the additional effort which must be made now and in the future?"

Figure II.2 has been prepared to illustrate the findings. The solid lines show the additional percentage reduction in the birth rate which is required over time by length of lag. It can be seen that these percentages are not constant over time, rising rapidly in the first 15 years, declining for a period and then rising again. This latter rise is an interesting one. It is caused by the fact that when fertility remains constant, the number of women who reach the reproductive ages 15 to 20 years later is larger than when fertility is reduced. These larger numbers of women produce large subsequent birth groups even if their fertility has been somewhat reduced. It is this feedback mechanism which builds into a rapidly growing population the momentum for subsequent rapid growth.

The dashed lines in the table are the averages of the individual percentages. Both the "African" case of a short history of mortality fall and the "Asian" case of a long history of mortality reduction are shown. The higher average values, especially for the initial 15 year period, for the "Asian" case clearly stand out and are due to the fact that the age-groups which have been enlarged by the past mortality decline have already reached the reproductive ages.

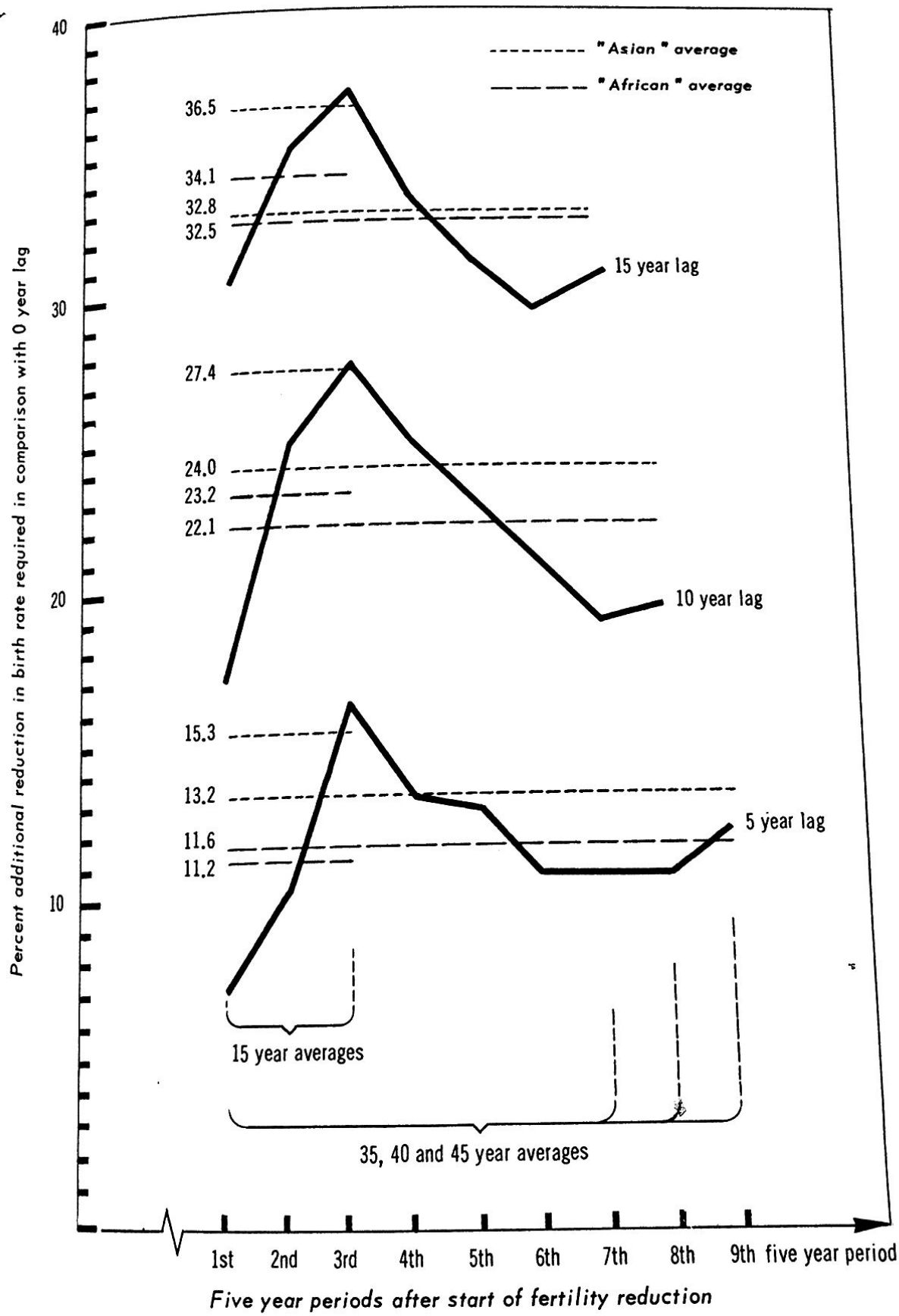
Figure II.2 demonstrates, for the "African" case, that a 10 year lag in fertility requires, on the average, a 22 per cent greater fall in fertility than no lag. Translated into the terms of family planning activity, we see that a 5 year postponement increases the size of the effort over the first 15 years by an average of 11.2 per cent per year (11.6 per cent per year over a 45 year period). An additional 5 year wait more than doubles the extra effort in the first 15 years to 23.2 per cent and almost doubles the yearly effort over the total 40 year period (22.1 per cent). A 15 year lag increases the effort to 34.1 per cent per year for the first 15 years and to 32.5 per cent per year for the total 35 year post fertility reduction period.

The Impact of Population upon Economic Structure

The economic impact of population is not, of course, limited to the aggregate effects discussed above. In the following section we examine the effect of alternative population trends on the

Figure II.2

ADDITIONAL FERTILITY DECLINE
IMPOSED BY DELAYED FERTILITY REDUCTION



structure of output. We find that rapid population growth does not maximise market size nor yield an optimum market structure. A slowing of the population growth rate produces a more developed economic structure in that the agricultural sector is relatively smaller and the industrial and transportation and communication sectors are relatively larger.

Aside from the special advantage of location and natural resource endowment, the major variables determining the dynamics of market structure would appear to be changes in per capita income and changes in population size. The effect of per capita income is felt chiefly through its influence on consumption patterns and population through its influence on economies of size. From cross-sectional regression analysis we have evidence of the relative importance of these two variables in determining the growth of the various sectors. The coefficients of each are given below.

SECTOR GROWTH ELASTICITIES

	Industry	Transportation and Communication	Other Services	Mining	Agri-culture
Per Capita Income Growth Elasticities	1.36	1.29	1.07	0.94	0.49
Population Growth Elasticities	0.05	0.05	0.01	0.13	-.08

Source: Hollis Chenery, "Patterns of Industrial Growth", American Economic Review, September 1960.

It should be noted that the per capita income elasticities are substantially more important for all sectors and highest in the crucial Industry and Transportation and Communication sectors. This is extremely important since it calls into question the unsophisticated but often heard argument that rapid population growth is desired in order to enlarge the domestic market and achieve economies of size. This is true because the low population growth elasticities mean that population growth does not contribute much to the growth of sector output while the high income elasticities mean that this more important variable should not be neglected in analysing the effect of population increase on economic structure.

We have explored the market size argument by disaggregating or breaking the economy into five sectors: agriculture, mining, industry (including manufacturing and construction), transportation and communication and other services. We assume two rates of growth of total output: 3.5 per cent per year and 6.0 per cent per year; and two population trends for each, one in which fertility is constant and another in which fertility falls moderately fast. In the constant fertility assumption the annual population growth rate increases from 0.034 in time t0 to 0.038 in time t35, while in the declining fertility case it slows to 0.0185 in t35. From our aggregate models we know that for most parameter choices, rapid population growth produces a net negative impact on the rate of growth of <u>total</u> output as well as on <u>per capita</u> output, but we assume for simplicity that total output would increase at the same rate regardless of the trend of population. The growth rates of output and population allow us to calculate the rate of growth of per capita income. We start our calculations from sector outputs which are representative of typical economic structures for underdeveloped countries. Multiplying the growth rates of output and population with their respective sector growth elasticities yields each sector's growth rate of output. This rate, in combination with the absolute levels yields estimates of output for each sector for our 30 year time period. The results are presented in Tables II.3 and II.4.

Table II.3 compares the economic structure for each output growth rate and population version.

The table demonstrates that population trends do influence the structural character of a developing economy. Declining fertility yields an economy with larger industrial and transportation and communication sectors, and smaller agricultural and mining sectors, a configuration which is more "developed" and which emphasises the more "modern" sectors.

Table II.3

POPULATION GROWTH AND ECONOMIC STRUCTURE

Rate of Growth Total Output in per cent per year	Number of years after date of possible fertility decline	Per cent of Total Value Added Produced in Given Sector									
		Agriculture		Industry		Transportation & Communication		Mining		Other Services	
		Population Growth: I. Declining fertility II. Constant fertility									
		I	II	I	II	I	II	I	II	I	II
3.5	0	31.5	31.5	22.8	22.8	4.9	4.9	1.6	1.6	39.2	39.2
	10	30.7	30.2	23.2	23.5	5.0	5.0	1.7	1.7	39.4	39.5
	20	30.1	28.3	23.5	24.7	5.0	5.2	1.8	1.7	39.6	40.0
	30	29.6	25.8	23.6	26.3	5.1	5.5	1.9	1.8	39.8	40.6
6.0	0	29.7	29.7	23.9	23.9	5.1	5.1	1.6	1.6	39.6	39.6
	10	25.7	25.2	26.5	26.8	5.5	5.6	1.7	1.7	40.6	40.7
	20	22.0	20.6	29.1	30.3	6.0	6.1	1.7	1.7	41.3	41.3
	30	18.8	16.2	31.5	34.1	6.4	6.7	1.8	1.6	41.5	41.4

As pointed out above, one phase of the market size argument is to achieve economies of large scale production. To examine this aspect, we present Table II.4, which is concerned with absolute sector size. Table II.4 presents the ratios of the absolute size of each sector when fertility is declining to the absolute size of the same sector when fertility is constant.

The conclusion which emerges is that the structure associated with declining fertility achieves maximum growth in those sectors most characterised by economies of size, or the economic advantages associated with large scale production, namely Industry and Transportation and Communication.

A second conclusion is that the structural advantage produced by a slower population increase is almost constant over a wide range in the rate of growth of output. This is seen by the closeness of the sector size ratios for the two output growth rates. For example, after 30 years the relative size of the industrial sector is very close, 110.8 vs. 110.1, for either output growth rates. The meaning of this is that rapid economic growth does not reduce or substitute for the influence of declining fertility on relative economic structure.

Table II.4

POPULATION IMPACT ON SECTOR SIZE
RATIO OF EACH SECTOR, DECLINING FERTILITY TO
THE SAME SECTOR, CONSTANT FERTILITY

Number of years after fertility decline	ECONOMIC SECTOR									
	Agriculture		Industry		Transportation & Communication		Mining		Other Services	
	Annual Growth Rate of Total Output in Per Cent									
	3.5%	6.0%	3.5%	6.0%	3.5%	6.0%	3.5%	6.0%	3.5%	6.0%
0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
10	98.2	98.3	101.4	101.1	100.9	100.9	99.1	98.8	100.2	100.1
20	93.6	94.3	104.9	104.5	103.7	103.3	96.5	97.0	100.8	100.6
30	86.7	87.4	110.8	110.1	107.9	107.6	93.8	93.7	101.7	101.5

Our conclusions are that rapid population growth hinders to a moderate extent the emergence of a market structure patterned along developed lines. Furthermore, since the growth of the industrial and transportation and communication sectors are especially retarded, the achievement of economies of size is little realised since these sectors are the ones in which most of the economies are to be realised. The argument that larger populations are desirable as a means of increasing the market is inadequate since it neglects the very important per capita income dimension in the determination of market size and structure.

Employment Effects

Population growth influences both the total size and structure of output and thus influences the employment absorptive capacity of the economy. The structural effects on employment of moderate fertility arise from the fact that the agricultural sector, which is smaller in the high per capita income declining fertility case, is a more labour intensive sector than the larger, less labour intensive industrial sector. Thus, employment will be greater with declining fertility if the industrial and transportation and communication sectors are sufficiently large so as to compensate for the smaller agricultural sector. This is an empirical question which depends upon the actual labour intensities of the various sectors and their changes in absolute size during the development process. Preliminary results from our studies indicate that in countries with very large potential agricultural land resources, a slight employment advantage lies with the high fertility-agricultural economy. This advantage lasts as long as the under-utilised land supplies can absorb the agricultural labour force. In other countries with only moderately extensive land margins, the exhaustion of this margin limits the absorptive capacity of agriculture and the employment advantage shifts to the more industrial low fertility economy.

The above discussion indicates that an employment demand advantage may lie with the more rapidly growing population. However, when we combine the demand effects of population with their supply effects, the advantage shifts to the more slowly growing population because rapid population growth increases the supply of labour by more than it increases the demand in these special cases where it does increase the demand. We may conclude, therefore, that from a full employment standpoint the advantage lies with reduced fertility.

The labour supply phenomenon mentioned here is now emerging as a reality in several countries who have achieved a reduction in mortality in excess of the fall in fertility for a sufficient period of time to allow the larger cohorts to reach labour force age. Korea is an example. In Korea the size of the group reaching age 20 or the number of new jobs which must be created, gradually rose during the 1960's from about 450 thousand per year to 560 thousand, an average of approximately 500 thousand per year. In the 1970's, the numbers will rise much more rapidly to approximately 950 thousand in 1980 for a decennial average of about 760 thousand per year. This implies a jump in the rate from 2.2 per cent per year to 5.4 per cent per year. The same process is also apparent in the labour force entrants section of Table II.

The Impact of Population upon Social Development

We wish to conclude this chapter with a look at the relevance of the population variable for several points of contact between population and social and economic development. The points selected are education, health and housing. The number of empirical studies designed to isolate the differential impact of alternative fertility and mortality conditions are amazingly few.

Education

Most work has been done in education. The underlying assumptions differ among studies, e.g. the trends in fertility, mortality, enrolment rates, pupil-teacher and pupil-classroom ratios, teachers' salaries.

The most detailed studies have been done for the Republic of Korea and Pakistan. The effects of reducing fertility in these two studies are summarised in Table II.5.

The Korean study, which covers a longer time span, indicates that the advantage of declining fertility, in terms of the number of students, is 13.1 per cent after 10 years, 36.6 per cent after 20 years and 76.5 per cent after 30 years. The advantages, in terms of expenditures, are somewhat smaller.

Differences in the absolute levels of expenditure are interesting. In the Korean study, for the case in which enrolment ratios are constant, a decline from 5.4 per cent to 4.3 per cent in the ratio of expenditures to Gross National Product occurs in the declining fertility case in contrast to a rise to 6.2 per cent

Table II.5

EDUCATION AND REDUCED FERTILITY, KOREA AND PAKISTAN

Number of years after beginning of fertility decline	Percentage Advantage(1) in Number of Students		Percentage Advantage(1) Total Expenditure on Education	
	Korea(2)	Pakistan(3)	Korea	Pakistan
10	13.1	7.6	11.8	4.0
20	36.6	36.2	28.3	20.0
30	76.5		44.2	

(1) Per cent by which numbers in the high fertility projection exceed those in the reduced fertility projection.

(2) All levels of education, including college and university.

(3) Students to age 17, grade 10.

Sources: Meredith Burke and Gavin Jones, The Demographic Obstacle to the Attainment of Educational Goals in the Republic of Korea. The Population Council, New York, 1969, mimeo.

Gavin Jones and Jayati Mitra, The Demographic Obstacle to the Attainment of Educational Goals in Pakistan. The Population Council, New York, 1969, mimeo.

in the high fertility projection. When the enrolment ratio is allowed to increase, the percentage of Gross National Product absorbed by education rises by 3.8 percentage points to 10.0 per cent (6.2 + 3.8 high fertility case) and 3.1 percentage points to 7.4 per cent (4.3 + 3.1 declining fertility case) at the end of 30 years. Thus, when enrolment rates increase, fertility reduction saves 2.6 percentage points (10.0 - 7.4) but this saving is less than the rise in costs incurred in achieving these enrolment rates (the 3.8 and 3.1 percentage points mentioned in the preceding sentence). This says that without fertility decline an increase by 83.9 per cent (2.6/3.1) of the proportion of Gross National Product needed to cover enrolment increase would be required. A similar comparison is possible for Pakistan. Raising the enrolment ratios increases the percentage of Gross National Product flowing to education from 1.4 per cent to 6.2 per cent in the constant fertility case and from 1.2 per cent to 5.4 per cent in the declining fertility case after 20 years, an increase of 4.8 and 4.2 percentage points. The reduction of fertility results in a saving of 0.8 percentage points (6.2 - 5.4) or the avoidance of an increase of only 18.9 per cent of the enrolment increase needs (the 20 year figure for Korea is

66.7 per cent). Thus, the conclusion emerges that the education problems, as the economic development problems, cannot be eliminated by a reduction in fertility but can be made substantially easier and considerable improvement received in exchange for moderated rates of population expansion.

Health and Housing

Less complete studies have been carried out for health and housing. In the health area a study of the Philippines, which allows for an increase in per capita health expenditures, shows a ratio of health costs in the high population projection to the low projection of 4.1 per cent, 16.3 per cent and 38.4 per cent after 10, 20 and 30 years respectively. A similar estimate was made for Turkey except that a much more rapid rate of increase in per capita costs was allowed for. The ratios of advantage, however, are quite similar, e.g. 36.7 per cent advantage after 30 years. This is interesting since it indicates the stability of the fertility reduction advantage under widely differing projective assumptions. Much work needs to be done to establish the magnitudes of the health impact of fertility reduction at the micro or family level. Since the health of mothers and children constitutes an important part of the rational for family planning programmes, we need improved estimates of this impact.

Housing is often cited as an almost perfect example of how population growth diverts investment resources from more to less productive uses. It must be expected, however, that a major impact of alternative population trends upon the resources devoted to housing is bound to be a rather long-run phenomenon since housing needs are largely a function of family formation and family formation rates cannot be much affected by fertility reduction until some 20 years or so after its onset. The volume of resources diverted from more productive investment opportunities to housing investment depends, of course, upon a host of factors which are not directly demographic, such as the rate of urbanisation, if urban and rural housing standards differ, the increase in better quality housing which accompanies rising incomes, climatic conditions and household norms. A projection of gross housing expenditures under conditions of no change in the percentage distribution of houses by quality class and no change in the quality of housing within quality categories shows very modest differences in housing expenditures as a result of alternative population trends. The percentage

advantages of reduced fertility are 0.0 after 10 years since no change in family formation has yet occurred, 0.9 per cent after 20 years and only 6.6 per cent after 30 years. If net housing or new housing (gross housing minus replacement) is examined, larger differences occur since net housing is more directly responsive to population differences. The advantage of reduced fertility is 0.0, 0.9 and 19.9 per cent after 10, 20 and 30 years respectively.

The foregoing review may be summarised in the following proposition: Unrestrained fertility,

(1) while not an absolute barrier is an important hindrance to economic development;
(2) its importance increases rapidly as time passes;
(3) because it is a difficult variable to manipulate and because a past demographic situation continues to exert its influence for at least 50 years, long lead times are required in population policy;
(4) continuingly high fertility hinders the development of an economic structure which is modern and capable of achieving the efficiencies of large scale production;
(5) falling fertility contributes to but does not automatically solve problems of full employment, adequate education, improved health and housing on a national level;
(6) on the family level, the returns from lowered fertility are more immediate in terms of improved health, nutrition and educational standards, but much research needs to be devoted to this neglected area to determine the magnitude involved.

Chapter III

THE RESPONSE TO POPULATION PROBLEMS

The Current Status of Major Family Planning Programmes

The problems posed by rapid population growth have formed, in a growing number of countries, the basis for an active population policy designed to reduce that growth. This reaction has been in good part a response to the kinds of problems discussed in the previous chapter. This generalisation emerged from answers given by programme administrators to our questions[1] of what the forces were which triggered the policy response in their countries. In these answers the role of economic planners in recognising the degree to which rapid population growth comprised and constrained the ability of the economy to reach its economic growth targets was consistently emphasised. Education Ministers were commonly mentioned as a source of impetus towards the recognition of the desirability of restoring a demographic balance as they wrestled with the added educational strain imposed by accelerating school-aged populations. The concern for the health of mothers and children has been a very important additional factor.

Broadly speaking, government-sponsored family planning grew out of socio-economic considerations in Africa and Asia, while, due to religious and other related factors, medico-humanitarian motives have so far dominated the Latin American scene. In certain cases, reports by foreign advisors which brought to the attention of the competent authorities the implication of their population growth

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(1) The information contained in this paragraph was condensed from a Questionnaire on National Family Planning Programmes, OECD Development Centre, 1969.

proved an important element. The development of a voluntary birth control policy was facilitated in several of the early cases by surveys which clearly showed that a large proportion of the people wanted smaller families and wanted family planning information.

In examining the economic-social-demographic characteristics of underdeveloped countries having a favourable position on family planning, an observer recently noted that the size of population and the level of education seem to be the most common correlates.(1) These were followed by per capita income, the population density and, finally, the population growth rate. In other words, a developing country characterised by a large population, a comparatively high level of education and per capita income, a high population density and a continuing rapid population growth, would represent the most eager family planning client.

During the 1950 decade, numerous voluntary groups were formed in developing countries to spread the family planning message and to provide clinical services on a pilot basis. Government-sponsored voluntary family planning first began in India in 1952, but it was not until the early 1960's that other governments responsed favourably to the increasing local demands and made family planning a national policy. Since the middle of this decade, the movement has spread to cover most countries in Asia and a number of nations in Africa and Latin America. Today some thirty governments in the developing world have adopted family planning as an official state-supported policy.In about thirty other less developed countries, the authorities accept the family planning work carried out by voluntary groups. Some 90 per cent (including Mainland China) of the Asian population live in countries with established family planning policies and service programmes, while corresponding figures for Africa and Latin America amount to between 20 and 25 per cent. In global terms, this implies that roughly three quarters of the total population of the developing world now live in countries officially favouring family planning although all families in these countries do not have ready access to efficient birth control services.

From an administrative standpoint, the vast majority of the operational national programmes are run by the Ministries of Health, usually closely related to the maternal and child health structure.

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(1) B. Berelson, "National Family Planning Programmes: Where We Stand", in Studies in Family Planning (supplement), March 1969.

In a few cases, however, (e.g. Malaysia and Pakistan) separate governmental bodies have been set up to administer family planning services.(1) Whatever the administrative form, a close inter-ministerial and inter-disciplinary co-operation has proved essential to ensure the high level involvement of ministries dealing with education, labour, agriculture, community development, and the like. Experience has further demonstrated the importance of giving the leadership of the national population programmes the highest possible administrative status. Ideally, the authority should be derived from the chief executive of the country.

Institutionalised family planning aims at providing couples in the reproductive age-group with information about responsible parenthood and access to contraceptive services. Programmes differ widely depending upon national policies and the degree of government involvement. There seems to be a rapidly growing awareness, however, that the provision of clinical services is not sufficient per se to realise the targets set for a decrease in fertility. Intensified efforts are therefore taking place to spread the notion of the happy, well-fed and well-educated small family with only two or three children. This implies the gradual build-up of major educational and informational campaigns which involve several ministries and in which most development planners and community workers may eventually be involved, at least at the margin. The complexity of a national, well integrated family planning programme - covering permanent and mobile clinical services, information campaigns, training of staff, research and evaluation - explains why the Ministry of Health may not always be the ideal choice for co-ordinating the activities.

While, as stated above, the aim of family planning activities is directed to provide information and contraceptive services to couples, i.e. the couple is the focus of operation, the goal of family planning programmes is usually stated in terms of a reduction in the birth rate or in the rate of growth of population. What we

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(1) For more detailed information about the administrative structures of a number of national family planning programmes see The Role of International Assistance in Population Programmes, OECD Development Centre, Paris, 1969, mimeo. Useful suggestions for the inputs needed to run a national family planning programme are found in the ECAFE report from The Working Group on Administrative Aspects of Family Planning Programmes, 1966.

Table III.1

NATIONAL FAMILY PLANNING PROGRAMME TARGET, 1970, 1975, 1980

Country	Birth Rate			Target Category								
				Couples Protected (in thousands)			Programme Budget Millions, Local Currency			Programme Personnel (in thousands)		
	1970	1975	1980	1970	1975	1980	1970	1975	1980	1970	1975	1980
India(1)	37.0	31.7	25.0	6,600(2)	34,600(3)	-	420	960	1,200	61.3	156.3	173.5
Korea(4)	26.8	21.2	17.5	1,096(5)	2,011(5)	1,853	0.56	0.61	0.46	2.6(6)	2.8(6)	2.1(6)
Kenya	50.0	45.0	40.0	-	-	-	-	-	-	-	-	-
Malaysia	35.0	32.0	29.0	-	-	-	-	-	-	-	-	-
Mauritius	30.0	25.0	23.0	32	56	95	1.28	1.69	2.08	0.46	0.63	0.70
Pakistan	41.2	33.2	-	5,000	11,200	-	100	113	-	56.4	25.9(7)	-
Trinidad & Tobago	26.3	23.2	20.0	-	-	-	282(8)	340(8)	350(8)	See note 9		
Turkey	40.0	35.0	32.0	-	-	-	2.8	3.8	4.8	0.32	0.40	0.40

(1) Dates refer to April 1 - March 31, 1969-1970 1973-1974 and 1978-1979.

(2) From Population & Family Planning Programmes: A Factbook, Population Council and International Institute for the Study of Human Reproduction, 1970 - as of beginning 1969.

(3) The Fourth Plan (1969-70 to 1973-74) "proposes to cover 28 million couples". Questionnaire on National Family Planning Programmes, OECD Development Centre, 1969.

(4) Dates refer to 1971, 1976 and 1981.

(5) National Programme. National Programme plus "Self-support" contraceptives equal 1,566 and 2,413.

(6) Full-time personnel.

(7) The Fourth Plan (1970-1975) envisages full-time personnel exclusively. This explains the fall.

(8) Thousands of U.S. dollars.

(9) Total numbers are 16, 18, 18.

Source: Questionnaire on National Family Planning Programmes, OECD Development Centre, 1969

have then is a process which may be thought of in an input-output sense. In this sense, the couples protected represent intermediate output which is produced by inputs of material and labour and which in turn produces the final output of an effect upon the birth rate. When viewed in this manner, we see that certain consistent relationships exist which connect these elements and which, for management and planning, may be presented as an interconnected set of targets for the birth rate, the number of couples protected, the size of budgets and the number and type of personnel. In efficient management and planning, this linkage among targets must be carefully worked through until a consistent set of targets is arrived at.

In our examination of national programmes, it was found that in many cases, the initial step of establishing targets has not even been taken. In other programmes, however, sets of targets have been established. An analysis of these sets for the 1970 to 1980 period provides an insight into the current and future operations of the programme. The targets are given in Table III.1 and the corresponding percentage changes in Table III.2.

A number of points emerge from these tables. The first concerns a change in the level of input and output targets between the two periods. This point is developed in the following chapter. A recent finding concerns the consistency of the target linkages over time. A few illustrations bring this out. In as labour-intensive an activity as family planning, one might anticipate a close linkage between changes in budgets and personnel. The entries in Table III.2 show very stable linkage over time for Korea but not for Turkey or India. Turkey, for example, foresees in the 1970-75 period, a 35.7 per cent increase in the budget and a 25.9 per cent growth in personnel in contrast to a 26.3 per cent expansion in the budget but no increase in personnel in the later period. Similarly, the first period Budget-Personnel target ratio for India is seen to be 2.0 in comparison with a ratio of only 0.4 in the second period. Some variability can be expected, of course, since programmes may change their mixture of full and part time and/or professional and non- or para-professional personnel. Since the personnel targets used are not adjusted for changes in mix, such changes may be emerging in the analysis.

Other examples of instability are apparent. Trinidad and Tobago visualise a substantial fall in the rate of increase of programme inputs in the 1975-80 period (budget growth is to be only 60 per cent of earlier expansion and personnel is not expected to grow at

Table III.2

NATIONAL FAMILY PLANNING PROGRAMME TARGETS

Changes 1970 to 1975 and 1975 to 1980

Country	Birth Rate		Target Category					
			Couples Protected		Programme Budgets		Programme Personnel	
	Percentage Change							
	1970-75	1975-80	1970-75	1975-80	1970-75	1975-80	1970-75	1975-80
India	-14.3	-21.1	324.0	-	128.6	25.0	254.8	11.0
Korea	-20.9	-17.5	83.5	- 7.9	8.8	-24.6	8.7	-24.6
Mauritius	-16.7	- 8.0	75.0	169.6	31.5	23.4	36.6	11.0
Pakistan	-19.3	-	224.0	-	26.0	-	-	-
Trinidad & Tobago	-17.9	-13.8	-	-	20.6	2.9	12.5	0.0
Turkey	-12.5	- 8.6	-	-	35.7	26.3	25.9	0.0

all) but only a 23 per cent reduction in the rate of fall of the birth rate. Mauritius is a more extreme example. A planned reduction in the growth of personnel inputs of 53 per cent with a slight increase in the rate of budget expansion is expected to more than double the rate of acceptance (the percentage growth of couples protected) and yet the anticipated rate of decline in the birth rate is less than one half of the 1970-75 decline.

It would appear that some of the programmes may not be operating with sets of targets which have been worked through for consistency and appropriateness. The development of planning models pegged to population projections which would facilitate the development of consistent sets of targets for a country could provide an important planning aid and management tool for family planning programmes.

Resource Inputs in Family Planning

In 1969 the personnel and monetary inputs of the national family planning programmes were of the magnitude presented in Table III. Because of the large absolute numbers involved, the Indian and Pakistani programmes are listed separately.

Some idea of the relative size of this resource input can be gained by stating it in per capita terms. For the countries listed, the personnel input represents something of the order of one full-time equivalent family planning person per ten thousand population. The budget figure represents U.S. $0.10 or about the same as an ice cream cone per year per person. Using the rule of thumb for married women in the reproductive ages, the figure becomes U.S.$0.60.

The Role of Foreign Assistance(1)

The concept of international assistance in family planning was introduced in the early 1950's when private organisations such as the International Planned Parenthood Federation (IPPF), the Ford Foundation, the Population Council and the Pathfinder Fund began providing support. In 1958, the Swedish Government became the first government to engage directly in operational family planning assistance. Since then a number of other private groups and

(1) This section is partly based upon a paper by Carl Wahren, "International Assistance in Family Planning" presented at the Conference on Family Planning and National Development at Bandung, Indonesia, in June 1969.

RESOURCE INPUT: SELECTED NATIONAL FAMILY PLANNING PROGRAMMES, 1969

Programme	Personnel Resources 1969				Financial Resources Fiscal Year 1968-1969
	National Programme		Affiliated Programme		Budget in '000 U.S.$
	Full Time	Part Time	Full Time	Part Time	
India	44,584		N.A.	N.A.	41,190
Pakistan	3,381	37,475	115	51,610	22,397
Other	3,424 (1)	5,155 (1)	527 (1)	3,123 (1)	8,258 (2)
Total					71,845

(1) Includes Ceylon, Jamaica, Kenya, Korea, Malaysia, Mauritius, Morocco, Nepal, Singapore, Trinidad and Tobago, Tunisia and Turkey (some countries in calendar years). Current data were not obtained for Chile, Colombia, Iran, Taiwan and the United Arab Republic.
Affiliated personnel not available for Trinidad and Tobago or Ceylon.

(2) Includes Jamaica, Korea, Malaysia, Trinidad and Tobago, and Turkey. Several programmes have integrated family planning and maternal and child health programmes which prevents a breakdown of the family planning component. For this reason, Ceylon, Morocco, Nepal, and Tunisia had to be excluded.

Source: Questionnaire on National Family Planning Programmes, OECD Development Centre, 1969.

foundations, governments and international organisations have made family planning assistance an integral part of their overall foreign aid programmes. In the last two decades, international aid has been essential in creating a general climate of opinion favourable to family planning, in forming and supporting private voluntary groups, in assisting clinical training and research activities necessary in the initial stages before official local support was obtained, and finally in advising and assisting governments in the formulation and execution of national population policies.

Assistance is primarily extended to those approximately thirty developing countries which are now carrying out government sponsored family planning programmes. Assistance is also provided to the large group of nations where voluntary associations and individuals are laying the ground for future national population programmes through their dedicated pioneering efforts.

One outstanding feature of the financing of these programmes is the high proportion of foreign assistance. In those countries having national programmes in which a separate family planning budget exists or can be discerned, we calculated the amount of the total budget, either 1968 or 1969, which came from foreign sources in either local currency or foreign currency, including the monetary value of supplies and equipment. The percentages of foreign sources are 14 per cent for India, 34 per cent for Korea, 29 per cent for Malaysia, 47 per cent for Trinidad and Tobago, 68 per cent for Pakistan and 75 per cent for Mauritius.

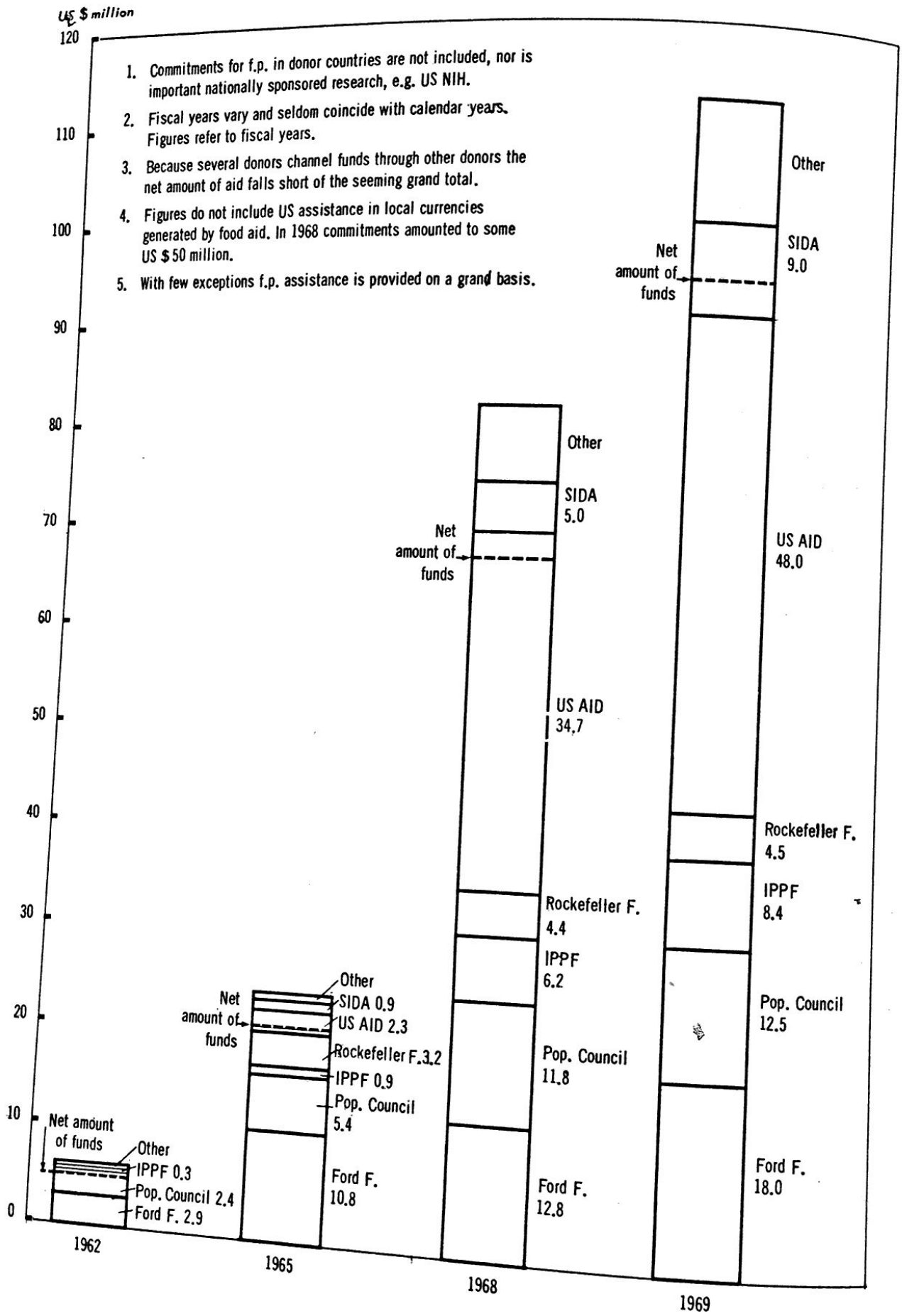
Family planning assistance is extended to national programmes or private associations in response to specific requests. An important element in considering requests for assistance is that the recipient programme should be based on voluntaryism. Its aim is to encourage and supplement, not substitute, the countries' own efforts.

Overseas support has come from an increasing number of sources. All along, the major American foundations and the IPPF have provided a very substantial part of the total resources that have gone into the field (see Figure III.1). Indeed, for the first ten years, they were practically alone. Until recently, governments' assistance has been sparse. Even today, it is highly limited as far as the number of donors is concerned. This is not surprising. Few governments in the West have ever supported voluntary birth control in their own countries. If anything, the private family planning associations, which were established in most industrialised countries, probably encountered considerably more hostility and ignorance from their own authorities than was later experienced in other parts of the world.

The total financial resources committed to foreign assistance in this field has grown very rapidly. In 1962, less than U.S.$5 million of overseas aid went into family planning. In the mid 60's the volume had risen to some U.S.$20 million. In 1968, approximately U.S.$70 million were committed for family planning assistance

Figure III.1

VOLUME OF INTERNATIONAL ASSISTANCE IN FAMILY PLANNING BY MAJOR DONORS (COMMITMENTS) 1962 - 1969



purposes. An estimate for 1969 amounts to U.S.$95 million.[1] Figure III.1 presents a breakdown of this assistance by major donors.[2] The data in the figure are arranged according to the time period of commitment. They show the rapid increase and indicate the growing importance of the United States assistance. Attention should be drawn to the dotted lines labelled "Net amount of funds". This figure is arrived at by deducting the double counting which occurs in commitment figures because one agency contributes to other agencies. Disbursements, not commitment figures, are, of course, what are needed to measure financial aid flows. Our studies indicate that the disbursements for calendar 1968 amounted to U.S.$42.5 million compared to the some U.S.$70 million for net commitments shown in the figure. The chief difference between disbursements and commitments is accounted for by the U.S. AID. The difference is approximately U.S.$28 million. The time reference points are somewhat different but since the United States fiscal year runs from July 1967 through June 1968, the stated difference between disbursements and commitments is a conservative estimate.

A total of about 400 professional people on the donor side take part on a full-time basis in this international collaboration. In addition, some 200 members of the United States Peace Corps are serving within family planning programmes in Africa, Asia and Latin America.

Turning our attention now to the functional role of foreign assistance, we note, of course, that these functions reflect the areas of activity of the programmes themselves. Foreign aid funds are used for supplies and equipment requiring foreign currency, salaries for foreign advisors and some local staff, fundamental (human reproduction) and applied research (including evaluation), training programmes at various levels (including conferences and seminars), information and mass communication activities, and administration. Table III.4 has been prepared to show in a more analytical fashion the patterns of aid use. A perusal of the data shows a fair degree of dissimilarity.[3]

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(1) Figures do not include United States assistance in local currencies generated by food aid. In 1968 commitments amounted to some U.S.$50 million.

(2) Consult Appendix for an almost complete list of donors by level of activity and type of assistance.

(3) Precise use of the data for comparative purpose is not attempted because the reporting officials utilised somewhat different criteria in making their allocations among functional categories and currency sources.

Table III.4

FUNCTIONAL DISTRIBUTION OF FOREIGN ASSISTANCE, SELECTED FAMILY PLANNING PROGRAMMES

Top triangle is percentage of foreign assistance used in stated activity, bottom triangle is percentage of each activity financed by foreign assistance

Functional Activity	Country and Date						
	India	Jamaica	Korea	Malaysia	Pakistan	Trinidad & Tobago	Turkey(2)
	1968-69(1)	1969-70	1968	1969	1968-69	1969	1968
Training	23 / 68	10 / 77	09 / 99	17 / 47	06 / 94	10 / 62	07 / 84
Information & Education	23 / 38	29 / 35	09 / 75		13 / 83	17 / 68	14 / 66
Contraceptive Supplies	32 / 40	19 / 60	16 / 21	60 / 94	14 / 75	64 / 92	14 / 48
Research & Evaluation	05 / 28	04 / 85	10 / 89	07 / 52	07 / 78	08 / 40	08 / 88
Operational Activities	17 / 34	38 / 29	56 / 38	17 / 07	60 / 62	0 / 0	58(3) / 20(3)

(1) The pattern for 1968-69 is substantially different from that for other years. For example, in 1967-68 foreign assistance, except for the provision of 6 fellowships and 8 experts, amounted to only 1.4 per cent of programme expenditures and was entirely in the Contraceptive Supplies category.

(2) National programme budget by allocation.

(3) Also includes salaries and supplementaries.

Source: Questionnaire on National Family Planning Programmes, OECD Development Centre, 1969.

Examining first the top triangles, the percentage of foreign assistance used in each activity, we find that operational activities constitute the largest single use of funds in four cases and contraceptive supplies in three cases. Research, training and information and education are much smaller users because of their rather modest size *in toto*. The bottom triangles show that foreign assistance in research and training accounts for very large percentages of the total financing of these activities. The use of aid for contraceptive supplies is the most variable of the group both as a user of funds and as far as the importance of aid is concerned; by and large, it appears to be highest in the smaller and younger programmes. The relatively high proportion of foreign monetary resources for operational activities, ranging up to 62 per cent in Pakistan, may be surprising to some observers.

A changing role of foreign assistance can be expected as programmes mature and their needs change. One might anticipate, for example, an increasing emphasis upon research and evaluation, a decreasing emphasis upon training and a lessening dependency on foreign resources for operational activities. In fact, it would appear that a secular decline in the ratio of foreign to domestic resources might contribute a rough guide to the progress of the programme. Certainly, the continuation of a high ratio would imply that the programme was not successful in achieving the high domestic priority status which it needs for success.

Family planning assistance does not replace the needs for other forms of development aid. On the contrary, international support for local birth planning programmes is probably more readily accepted and given a better chance of success if it is accorded within a general context of development co-operation. The competition which is most often suggested is that between family planning assistance and aid in the field of public health. This perception of competition is fed by the view that support for maternal and child health finds itself in possible conflict with the demographic aims of family planning assistance. This view is not only unacceptable from an ethical standpoint but its validity appears to be questionable as well. The hypothesis that parents will be resistent to family planning on a widespread and intensive basis while facing infant mortality rates which, while falling, are still at levels several multiples higher than in the developed countries seems reasonable

and is being substantiated by current research.(1)

It may well be that in certain respects donors have focused too narrowly on family planning in the past. To show greater concern for public health problems in general and maternal and child health in particular would probably have a positive psychological impact and could well turn out to be one of the most effective ways of marketing family planning and of bettering the results so far achieved. These points bring us to the subject of the concluding section which deals with the gaps and shortcomings of foreign assistance.

Assistance in a future perspective

Summarising what has been achieved so far in coping with excessive population growth, a recent report states: "We have in no sense conquered this problem: at most we can claim to have hacked out the first one or two foot-and-hand holds at the base of a mountain".(2)

This quotation may serve to indicate how much work lies ahead before we can claim to have found a solution, permanent or temporary. In this work there are good reasons to believe that external assistance will continue to play a vital role. The much talked about "Green Revolution" has probably changed the time dimensions for the work, providing the world with a period of grace of one or two decades before the constraints of famine are imposed. These agricultural developments, however, do not provide an answer to the root population issues, especially not on the family level. They do serve, however, to instruct us that the population discussion should not be centered around the availability of food as the one, or even a main argument, for or against family planning.

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(1) See for example, David May and David Heer, "Son Survivorship Motivation and Family Size in India: A Computer Simulation" Population Studies, Vol.XXII, No.2, July 1968, T.P. Schultz, "An Economic Model of Family Planning and Fertility", Journal of Political Economy, Vol. 77, No.2, March/April 1969, T.P. Schultz, "The Effectiveness of Family Planning in Taiwan: A Proposal for a New Evaluation Methodology", Rand Corporation, mimeo, 1969, and Marc Nerlove and T.P. Schultz, "A Demographic-Economic Model of Family Decision making", presented to Econometric Society, December, 1969.

(2) Population Growth: The Impact of Advances in Agriculture and Medicine. Report of a Conference at Ditchley Park (United Kingdom), 3rd-6th January, 1969. Ditchley paper No.16. The Ditchley Foundation.

Realistic planning by donors of foreign assistance seems to be less adequate than that by some recipients, an evaluation of which was introduced in the previous section. At present, one easily gets the impression that there is more money potentially available for family planning assistance than there are serious assistance plans or innovative thinking. Therefore, a global assessment of financial and manpower requirements for family planning programmes during, say, the next ten years, should be undertaken and the specific function of international assistance defined. Priorities for external aid should be established and based upon estimates of world requirements. Areas must be identified where outside support can make particularly significant contributions. The specific role of private, governmental and international agencies should be analysed. They each have their particular advantages and disadvantages with regard to resources, mode of action, and international relationships. Because of the highly dynamic characteristics of the population issue, the general estimate we have in mind should be flexible enough to allow for the integration of important political and technological developments, as they occur. It might best be described as a perpetuating ten-year population assistance plan.

While waiting for this kind of analysis, either on a global or regional basis, let us briefly review some of the major areas, where international assistance could make valuable contributions in a short as well as long-term perspective.(1)

Assistance priorities

There is still a great need for efforts to promote a fuller understanding of the general population issue, particularly in Africa and Latin America. Asian countries with first-hand experience of population programmes could greatly contribute in this vital task. It is crucial that economic planning commissions and other

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(1) In their report Approaches to the Human Fertility Problem prepared in 1968 for the United Nations Advisory Committee on the Application of Science and Technology to Development, the Carolina Population Center suggests a number of other projects in which international assistance could play a useful role. For further analysis of the present and future role of international assistance, also refer to The Role of International Assistance in Population Programmes, Proceedings of an Expert Group Meeting held at the OECD Development Centre, Paris, 28th-29th April, 1969.

decision-making bodies and individuals get a realistic comprehension of the negative effects of population growth at the present rates. They ought to be informed about how much a continued passive policy will add to the burdens of the already heavily indebted next generation.

A continued effort must also go into exploring and explaining the relationships between population growth and socio-economic development in the technically more advanced countries. Not only does charity begin at home, but if donors acquire a more realistic understanding of the problem, recipients will benefit as well. The modest number of donor governments may in itself indicate that more information is needed in the technologically more advanced countries.

To achieve this, more research must be undertaken. We need to get, at least, a workable theory of the demographic transition. We must get to know more about the impact of population growth upon development at the aggregate national level and especially at the micro family level. Increased attention must be given to man's relationships with his environment. What constitutes an ideal ecological balance between population and resources? How should we properly define the often used concepts of "underpopulation", "overpopulation" and "optimal population"? Where will continuous urbanisation lead mankind? Is there a positive correlation between population pressure and aggressiveness?

We must find effective, safe, attractive and cheap contraceptive methods, particularly adapted to the local conditions in the developing nations. Maybe the medium is the message? Until we find the "ideal" contraceptive(s), we must intensify our efforts to create international standards for the present methods and continue to press down prices. Local manufacturing may be increasingly considered and supported.

We must explore methods for adapting traditional cultural patterns to the needs of modern society. If, e.g. we intend to convince women to bear fewer children and to reproduce early in their marriage, we should give some thought to the question: what will these women do when, at the age of 25-28, they have sent their two offsprings to school? What will be their new purpose in life? These women will belong to the new generation; many of them will have gone to school themselves. Measures must be taken to facilitate their entry into professional life. This may well have a greater impact upon fertility rates than any sophisticated information campaign.

So far, with some notable exceptions, donors have shown more interest in strengthening the resource base at home rather than overseas. Institutions providing training and research facilities must now be built in those countries where action is to take place. It seems reasonable that, in principle, every country of a certain size should have its own national population centre, as great numbers of people must be continuously trained and evaluation and programme-oriented research will have to be undertaken on a permanent basis.

Maternal and child health structures must be established and infant mortality rates brought further down to create credible evidence in support of the family planning message.

More attention should be given to the question of how to introduce family life and sex education in school curricula at various levels.

Methods of evaluating family planning programmes must be improved. A realistic cost-benefit analysis cannot be undertaken unless we know what is happening to fertility rates and why; nor can present performance be improved until we know where things go wrong. Donors and recipients alike need to busy themselves with statistical reporting and analysis. Indications about results and prospects for the future are eagerly awaited by planners on both sides.

Improving Aid Relations

To increase the efficiency and impact of foreign aid, several problems must be tackled. It is necessary to work towards increased co-ordination of donor activities. Officials in recipient countries have testified how much valuable time and effort is lost due to lack of co-ordination. Donor delegations and fact-finding missions turn up every now and then and have proved to be quite time consuming for the local administration. Agencies often use differing standards for similar commodities, and supplies and equipment (including spare parts) come from different sources. This complicates logistics a great deal. Lack of co-ordination in timing also poses problems. It may be worthwhile to develop a consortium approach in family planning. This should diminish management problems and further an efficient use of existing resources.

The negative effects of red tape and personal bias must be frankly discussed. Irritations may arise concerning both donor and recipient restrictions. The influence of other "non-technical"

factors such as religious and political differences of opinion should be sorted out and reviewed.

More attention must be given to the absorptive capacity of aid, as this capacity is limited. One should analyse to what extent and where this limit has already been reached. Some evidence supports the view that there is a greater wastage of external than internal resources in certain places.

A first step towards increasing the absorptive capacity considerably may be for donors to expand the family planning concept to cover more than birth control aspects. There are vast needs for expanded aid in related fields such as maternal and child health care, nutrition, education, vital statistics and evaluation. Family planning programmes must find new ways of reaching out to people. A widening of the frame of reference would probably have a positive psychological impact and may well turn out to be one of the most effective ways of marketing family planning. Increased training of personnel and, possibly, a somewhat less restrictive donor attitude towards the provision of means to cover local costs may also help to increase the absorptive capacity. Above all, it is necessary that the recipient government grants the population programme priority treatment and allocates the necessary basic local resources.

Chapter IV

THE DEMOGRAPHIC IMPACT OF FAMILY PLANNING IN DEVELOPING COUNTRIES

It seems appropriate at this point to seek to evaluate the impact of the family planning response. We have to agree, however, with recent reviews of studies of the technical problems which arise in measuring the effects of family planning activities - they have not been solved.

The Quantitive Impact of Family Planning

The most straightforward criterion of the success of a family planning programme is a reduction in the number of births from what the number would have been in the absence of the programme. Thus, an obvious technique for evaluation which immediately suggests itself to the layman would be an examination of the trend in the crude birth rate. This "obvious" procedure must, however, be used with great caution. Hong Kong provides a good case study.(1) In Hong Kong, the crude birth rate declined from 35.5 per thousand in 1961 to 21.3 in 1968. The 19 per cent decline from 1961 to the 1965 rate of 28.8 is almost entirely (90 per cent) due to a reduction in the relative (and in some cases the absolute) number of women in the most fertile age groups and to a reduction in the proportions married at these crucial ages and not due to a fall in fertility at all. The 26 per cent decline from 1965 to 1968 is, on the other

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(1) For a more complete account see, Ronald Freedman, D.N. Nambothiri and A.Adlakha, "Hong Kong: The Continuing Fertility Decline, 1967", Studies in Family Planning, No.44, August 1969, pp. 8-15.

hand, almost wholly due to reductions in marital fertility. It is interesting and perhaps significant that this latter decline is consistent in time and age pattern with the family planning activities in the post 1964 period. It may also be true that some of the earlier decline which stemmed from delayed marriage should be attributed to the family planning campaign, which deliberately tried to change early marriage patterns. Thus, because of the sensitivity of the birth rate to changes in the age-sex-marital composition of a population, its trend cannot be uncritically used for evaluation purposes.

When we ask the question, how many births have been averted as a result of a programme, we face difficulties with both parts of this question, i.e., the number of births which have been averted and the number of averted births which are due to the programme. In evaluating an entire programme, one approach is to estimate the difference in the expected number of births and the actual number of births in the population.(1) Several approaches have been tried in an attempt to overcome the difficulty of determining the number of births which would have been expected in the absence of the family planning activities.

One approach, which has been used in evaluating the impact of the Taiwan programme, is trend analysis of the birth rate.(2) At the start of the programme in 1964 the birth rate was 34.5/thousand. By 1968 it had declined to 28.8/thousand, a rate of

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(1) In evaluating a particular contraceptive device, a similar procedure is often used which estimates the difference in the number of actual births among programme contraceptors and the number which would have been expected in the absence of programme contraception. In practice, a chief technical difficulty is the calculation of the number of births which would have occurred to acceptors. This arises because contraceptive acceptance is a non-random selective process so that non-acceptors' fertility cannot be used to measure acceptors' fertility in the absence of contraceptive use. The approach has been used, however, in the evaluation of specific contraceptive devices, especially the IUD. One attempt to handle the ceteris paribus condition is that by M.C. Chang, T.H.Liu, and L.P. Chow, "Study by Matching of the Demographic Impact of an IUD Programme", Milbank Memorial Fund Quarterly, XLVII, 1969. They matched acceptors with non-pregnant non-acceptors by age, parity, education and interval from last birth, recorded the fertility of the matches over time and used this as the estimate of potential acceptor fertility.

(2) John Ross, Oliver Finnigan III, S.M.Keeny and George Cernada, "Korea & Taiwan: Review of Progress in 1968", Studies in Family Planning, No.41, April 1969; and "First Quarterly Report on Taiwan Family Planning and Population Studies, January-March 1969", Taiwan Provincial Institute of Family Planning, Series p-7, (69-1), April 1969.

decline of 5.4 per cent per year. This decline could not be entirely credited to the programme, since fertility had been declining and would probably have continued declining by some amount even in the absence of the family planning programme. The birth rate decline of 2.3 per cent per year from 1951 to the programme start in 1964 was used as an estimate of this decline. A comparison makes it appear that the programme resulted in an acceleration of the decline by 3.1 (that is, 5.4 - 2.3) percentage points per year. This conclusion is open to criticism, however, on the grounds that due to the small size of the 1964 programme and the nine months gestation period, no significant impact could have occurred in 1964. If we include the 1964 birth rate in the pre-programme period and recompute the trends, we find a pre-programme decline of 4.0 per cent per year or a programme advantage of 1.5 percentage points. This type of evaluation procedure is not applicable, however, in many cases because it requires a time series of consistently high quality birth statistics.

Another related approach has been used in evaluating the Singapore programme.(1) In this procedure "expected" single year of age-specific fertility rates were calculated on the basis of pre-programme trends in these rates and used to estimate expected births. A comparison of actual and expected births yielded estimate of the births saved which could be attributed to the programme.

One of the problems with these kinds of approaches is that family planning is treated as a single unquantified independent variable. This means that the programme receives credit for new contraceptive acceptors and those who improve their contraceptive efficiency as a result of switching to more efficient techniques or as a result of increased motivation. The programme is also credited with the spillover effects of increasing non-programme activity, e.g. private doctor, or local family planning association activity. Any intensification of the effect of the other socio-economic determinants of fertility, both positive (e.g. the fertility reducing effects of an increasing rate of female labour force participation or growing educational opportunities) and negative (e.g.the fertility increasing effects of improved nutritional and medical care) are attributed to the programme as well. An evaluation technique which escapes from the weakness of having unquantified

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(1) D. Wolfers, "The Singapore Family Planning Programme: Further Evaluation Data". Paper presented to the London Conference, International Union for the Scientific Study of Population, September, 1969.

family planning as the only independent variable is multiple regression.(1) A multiple regression fertility model which includes quantified family planning as one of the several independent variables has been developed for Taiwan. Since there is no case in which family planning activities on a major scale have existed for a sufficient time period to allow for longitudinal analysis, only a cross-sectional study is possible. The Taiwan experience shows that family planning activity, as measured by lagged man months of effort, had a small but very statistically significant impact upon the adjusted birth rate. Unfortunately, few countries have the data required for this kind of analysis.

All of the above-mentioned techniques are data intensive and, therefore, cannot be directly utilised for our purpose of making a global assessment of the impact of family planning activities in underdeveloped countries. The data do not allow a precise attack on this question but it seems appropriate to attempt what must be a fairly crude approximation. The resulting calculation must be treated with caution, however; at best it will be only indicative of the magnitude of programme impact.

It is obvious that in order for a programme to produce a decrease in the birth rate it must achieve the intermediate step of getting fecund couples protected. The first step, therefore, is to estimate the increase in the number of protected fecund couples. The starting point for this is the data in Table IV.1 which assembles the figures on new acceptors by type of contraceptive from the major national and private family planning programmes in underdeveloped countries. We recognise that statistics which come from service records must be viewed with caution because of their inherent upward bias, but we have accepted them at face value in the following computations. Of the data presented, those for IUD's are probably the most accurate and those for conventional contraceptives, e.g. foams, creams, condoms, are unquestionably the least accurate since they were often derived from data on numbers of items distributed. We know that conventionals are sometimes utilised for non-contraceptive uses and that while some are used for contraception multiple times, the feeling is that some upward bias exists in the figure presented here.

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(1) See T. Paul Schultz, The Effectiveness of Family Planning in Taiwan: A Proposal for a New Evaluation Methodology, The Rand Corporation, 1969, mimeo.

Table IV.1

NEW ACCEPTORS BY CONTRACEPTIVE
Institutionalised Family Planning, Underdeveloped Countries, Recent Years

Country or Region	Contraceptive Method															
	Sterilization in 000					IUD in 000				Pills in 000			Conventionals in 000			
	1964	1965	1966	1967	1968	1965	1966	1967	1968	1966	1967	1968	1966	1967	1968	
India	318	487	801	1,602	1,709	610	885	729	526		1	7	494 (5)	473 (5)	755 (5)	
Korea	26	13	20	20	16	226	392	323	263		0	76	134	153	136	
Pakistan		1	29	152	416	38	483	671	865		0	0	639 (5)	1,327 (5)	1,699 (5)	
Taiwan		13(4)	13(4)	13(4)	13	99	111	121	124		28	36		N.A.		
Latin America (1)				1	1	23	77	146	136	42	62	113	3 (6)	1 (6)	2 (6)	
Others (2)		11	15	21	26	73	125	166	211	33	89	248	46	61	65	
Total (3)	344.6	524.8	877.9	1,807.2	2,179.8	1,068.5	2,073.5	2,157.0	2,125.3	75.3	179.8	479.7	182.9(7)	215.3(7)	203.8(7)	

(1) Excludes the Carribean. Includes Argentina, Brazil, Bolivia, Costa Rica, Colombia, Cuba, Chile, Dominican Republic, Ecuador, El Salvador, Guatelama, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Urugay, Venezuela. Annual allocations were made for Bolivia, Dominican Republic, Cuba, Peru and Uruguay for IUD's and Pills from 1965-68 totals, on the basis of the yearly pattern in Latin America net of Colombia and Chile.

(2) Barbados, Ceylon, Jamaica, Kenya, Malaysia, Mauritius, Morocco, Nepal, Singapore, Trinidad and Tobago, Tunisia, Turkey, United Arab Republic.

(3) Independently summed before rounding.

(4) Literature implies constant.

(5) Stock figure calculated from distribution data.

(6) Known to be underreported.

(7) Net of India and Pakistan stock figures.

Sources: Questionnaire on National Family Planning Programmes, O.E.C.D. Development Centre, 1969, Maria L. Garcia, Informe Sobre El Estado De Los Programas De Planificacion Familiar En America Latina, 1968, Centro Latinoamericano De Demografia, Serie A, Nº 97, Santiago de Chile, Octubre de 1969, Population and Family Planning Programmes: A Factbook, Population Council and International Institute for the Study of Human Reproduction, 1970.

The number of protected fecund couples over time is not the sum of new acceptors over the same time period because of the operation of two phenomena. The first is that not all couples accepting contraception persist with its practice, and the second phenomenon is that as females age, their reproductive capacity, their fecundity, declines. In most cases the onset of sterility is imprecisely recognised so that contraceptive use continues. This use is redundant, of course, and the family planning activity which produced it ceases to have a reproductive impact. It is, thus, apparent that to calculate the numbers of protected fecund couples it is necessary to determine the joint probability of a contraceptor continuing contraceptive practice and not becoming naturally sterile.

We have carried out the required calculations for each contraceptive separately. For sterilisation, we conceive of the proportion who continue practising as those couples which are not broken through the death of either or both partners. This is a function of mortality levels and we have chosen an annual proportion, 0.9809, reflective of Indian and Pakistani levels. The annual proportions not developing sterility were calculated from data developed by L.Henry(1) and are, by age of female 20-24 to 40-44: 0.99235, 0.9897, 0.9775, 0.93787 and 0.81217. We see that these rates vary considerably with age. We are, thus, confronted by the need for the age distribution of acceptors. For sterilisation, we have the age distribution of women who have themselves been sterilised plus those whose husbands have been sterilised from India. This distribution is used for all sterilisations. The error introduced by this simplification is probably not too substantial since the Indian programme accounts for large proportions of total sterilisations (Table IV.1). The results are presented in Table IV.2.

For the estimation of the number of practising fecund couples protected by the IUD, we use a parallel computation process. Continuation rates for IUD's are complex functions of such variables as the age and parity of the female, the time period between delivery of last birth and IUD insertion and the amount of briefing provided by the inserter. While continuation rates differ among programmes to some extent, we have chosen to use the following common set which were derived from the rates for India, Korea, Pakistan and Tunisia.

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(1) "Some Data on National Fertility", Eugenics Quarterly, 8, 1961, Table 3, p.85.

	Time after insertion in months			
	6	18	30	42
IUD Continuation rate	0.80	0.62	0.48	0.39

These were converted to annual proportions of those continuing IUD contraception. These proportions were combined with the non-natural sterility proportions given above to yield a joint proportions matrix in two dimensions, age and duration since insertion.

The age structure of IUD acceptors differs substantially among programmes so a separate calculation was made for India, Korea, Pakistan, Taiwan and the "others". The results of the computations are presented in Table IV.2.

A common set of continuation rates for pills was used. The rates are based upon evidence from India, Korea, Mauritius and Puerto Rico. They are as follows:

	Time after acceptance in months		
	6	18	30
Pill Continuation rate	0.655	0.490	0.305

The annual proportions continuing use were again combined with the non-natural sterility proportions and a joint age by duration matrix developed. The information on age structure of pill acceptors is considerably less complete than that for the IUD. For some programmes, such as the Malaysian programme, the pill has constituted the chief contraceptive technique while in others, such as the Korean programme, it has been used primarily in the role of a post-IUD failure contraceptive. In the latter cases the age pattern follows quite closely the IUD pattern, in the former an independent one develops. With insufficient evidence to allow individual country calculations for the major pill using programmes, Taiwan, Malaysia, Korea and Chile, we have used a single distribution. Only moderate error is introduced, however, since the use of contraceptive pills is, as seen from Table IV.1, a recent event, 65 per cent of all new pill acceptors occurred in 1968 and, thus, not much scope for ageing and natural sterility is involved. Table IV.2 contains the results of the estimation.

Conventional contraceptives raise a different sort of estimation problem. Table IV.1 shows that for India and Pakistan we have not the number of new acceptors but the number of users of a years equivalent supply of contraceptives. This is a stock not a flow figure. Thus the continuation rates were only applied to the flow

of new acceptors. The continuation rates for condom users from Mauritius were adopted, namely 0.48 for 6 months, 0.29 for 18 months and 0.21 for 30 months. Since Table IV.1 shows that the flow component constitutes a small proportion of the total and since we do not have an age distribution of conventional contraceptive users we ignore the fecundity adjustment.

Table IV.2 presents the number of potentially fecund contracepting couples resulting from institutionalised family planning activity from 1964 to 1968. The data are presented by contraceptive technique for the end of the year date given. Figure IV.1 is a graph of the data on semi-logarithmic paper.

Table IV.2

POTENTIALLY FECUND CONTRACEPTING COUPLES FROM INSTITUTIONALISED FAMILY PLANNING ACTIVITY 1964-1968

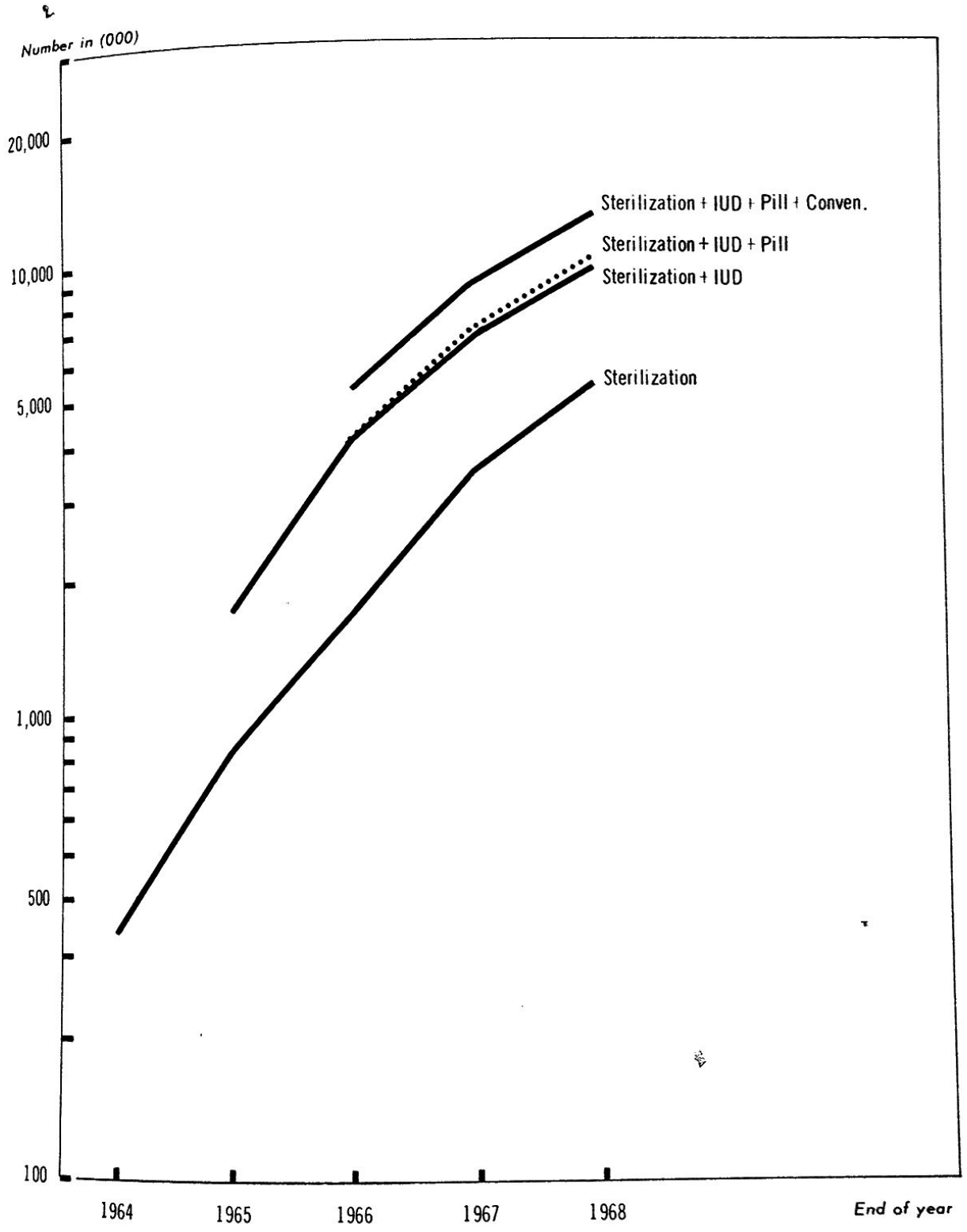
Year Ending	Number by Contraceptive in 000				
	Sterilisation	IUD	Pills	Conventional Contraceptives (1)	Total
1965	829	838		N.A.	
1966	1,643	2,249	48	1,134	5,074
1967	3,321	3,364	150	1,800	8,635
1968	5,279	4,185	411	2,454	12,329

(1) Indian and Pakistani user totals plus new acceptor continuers.

One interesting thing which can be noted from Table IV.2 is the relative importance of the various contraceptives in the total and their changes over time. Sterilisation contributed 32 per cent of total coverage in 1966, increased its role to 38 per cent in 1967 and expanded it still further to 43 per cent by the end of 1968. The IUD percentage has fallen from 44 per cent in 1966 to 39 per cent in 1967 and to 34 per cent by the end of 1968. Between these two contraceptives, they have maintained a steady proportion just above 76 per cent. The Table also indicates a very rapid growth in numbers. The compound rate from the end of 1966 to the end of 1968 was almost 56 per cent per year. This is a very high rate of increase but it was, of course, from a very small base. Differences in growth rates can be directly read from Figure IV.1

Figure IV.1

GROWTH OF FECUND COUPLES PRACTICING CONTRACEPTION



because of the use of the semi-logarithmic scale. The Figure shows that the rate of growth of potentially fecund contraceptors has been declining. This decline is due to the retardation in the growth of sterilisations and in IUD's. It can also be seen that the addition of pills into the contraceptive arsenal has not been able to offset this retardation because the numbers involved have been too small.

A Projective Evaluation of Family Planning Programmes

A second less technical way of evaluating the family planning movement is to see where and how far these programmes, as currently conceived, are and can take us. The foregoing estimate demonstrates that current levels of activity are having marginal effects. The key question is the degree to which this level of impact can be sustained and increased.

The impression which is received from a current review of programmes is one of an apparent loss of momentum. The loss of momentum is due to a variety of factors and can be documented by reference to the standstill status of several programmes at their initial level or stage of development, the slowdown in the growth rate of such a numerically important programme as India, and the unsteady trend of activities in such a "success" programme as Korea. In India the percentage change in the number of new acceptors of sterilisation, IUD and pills for the three years 1965-66 to 1966-67, 1966-67 to 1967-68 and 1967-68 to 1968-69 are respectively a 32.6 per cent increase, a 39.7 per cent increase and a 14.2 per cent decrease. In Korea, the family planning budget has increased by approximately 5 per cent since 1966. In the same period the health budget rose by 100 per cent and the national budget by 130 per cent. Family planning activities reflect this downgrading of priority. Using 1966 as the comparison, we find that condom distribution was 80 per cent in 1967 and 70 per cent in 1968 of what it was in 1966. For the same years loop insertions dropped to 80 per cent and 62 per cent of 1966, while sterilisations fell to 99 per cent and 80 per cent. The first ten months of 1969 show some recovery. The ten months' ratios of vasectomies in 1967, 1968 and 1969 to 1966 are 0.98, 0.77 and 0.81, thus showing 1969 levels still below 1966 and 1967 but up from 1968. The ratios for loop insertions are 90, 74 and 115, showing a renewed growth(1) in 1969 after two years of

(1) This figure is overstated to an unknown degree since the data reported for 1968 and 1969 are for first insertions and re-insertions, instead of just first insertions.

decline. 1968 and 1969 saw the introduction of contraceptive pills. The 10 month ratios of vasectomies plus IUD's and pills for 1967, 1968 and 1969 compared to 1966 are 0.90, 0.79 and 129. Thus, for the non-conventional contraceptives some renewed expansion can be seen after the doldrums of 1967 and 1968.

Turning from an historical review, we attempt to visualise the future rate of programme growth through an examination of the personnel and budget targets as determined in the various programmes themselves. The data for this come from Table III.1 in the previous chapter. In Table IV.3 below, we present the compound growth rates implied by these targets.

Table IV.3

TARGETED PROGRAMME GROWTH TO 1975 AND 1980 - PERSONNEL AND BUDGETS

Target Category	Compound Annual Growth Rate in Per Cent		
	1970-1975(4)	1975-1980(5)	1970-1980
Personnel			
Five countries(1)	19.9	5.2	10.6
Net of India	2.7	-3.4	-0.04
Budgets(2)			
Five countries(3)	14.2		10.8(6)
Net of India	2.4		-0.8

(1) Includes: India, Korea, Mauritius, Trinidad and Tobago, and Turkey.

(2) Converted to U.S. dollars.

(3) Includes: India, Korea, Mauritius, Pakistan, Trinidad and Tobago.

(4) India to 1974.

(5) For India the five year period is 1973-1974 to 1978-1979.

(6) Since the Pakistan target for 1980 is unstated, this figure is calculated net of Pakistan in 1970.

For both personnel and budgets we have shown growth net of India because the large absolute size of the Indian contribution has the effect of masking non-Indian behaviour. Once we do this, we note that the anticipated expansion in financial and human inputs is considerably reduced. Our group of target setting countries is small, of course, and perhaps non-representative so we prescribe caution in drawing general conclusions.

In drawing conclusions about the adequacy of programme growth rates, two phenomena which tend to require an acceleration in pace must be taken note of. The first of these is the rapidly growing size of the female groups in the reproductive ages. In Taiwan, for example, the number of women 15-49 will increase in seven years by 29 per cent from the current 3 million to almost 4 million in 1975. Within this reproductive age span, they will be concentrated in the ages of highest fertility. The number of women 20-24 will increase more than 78 per cent by 1975 and the age group 20-29 will contain 36 per cent of the women in the childbearing ages in contrast with the 30.7 per cent at present.(1) It is feared that the result may be that the fall in the birth rate is halted, since the younger ages are the ages least interested in family planning and the older ages are already being skimmed of much of their "cream" in the sense that a large per cent of the women in these age groups have already accepted or tried and rejected contraception. Taiwan, thus, produces a case study of how, as a result of rapid population growth in the past, the absolute number of women which must be reached by the family planning programme is substantially increased.

The second phenomenon is the imperfect survival or continuation rates for all contraceptors and contraceptives. In order to maintain a given increment in the number of participants in a programme, the number of new acceptors must grow rapidly. This growth is required because as the programme builds up the "stock of current users", the drop-out rates produce larger and larger numbers of former practitioners no longer using contraception who have to be replaced. It can be estimated that in order to recruit a constant 100 additional participants, 122 acceptors must be reached in the first year, 158 in the second, 196 in the third, 233 in the fourth and 270 in the fifth year assuming a monthly survival rate of 0.97. Thus, in the fifth year, 2.7 new acceptors must be found for every addition in the number of participants. The effect of these two phenomena, an increasing number of women who need to be added to the stock of contraceptors and an increase in the number of women who have to be recruited in order to add to the stock, is to produce a situation which requires considerable programme growth in order to maintain the desired rate of increase. In other words, a greater and greater effort is required to keep the same absolute level (a

(1) Taiwan Provincial Institute of Family Planning, First Quarterly Report on Taiwan's Family Planning and Population Studies, series P-7 (69-1), April 1969, p.7.

falling rate) of impact on the number of couples protected or on the birth rate. If family planning programmes are to move the world very far through or significantly hasten the demographic transition, a greater effort than even this must be achieved. How large this effort must be depends upon the rate of growth of the number of reproductive women, the rate of discontinuance, the level of current protection and the time period allowed for the transition, i.e. the rate of spread of contraceptive coverage.

In attempting to gauge the future contribution of family planning as currently conceived, organised and carried out, it is important to realise first that the only cases where family planning programmes can be shown to have had an apparent impact on the birth rate are in those countries, such as Taiwan, Korea, Hong Kong and Singapore, where they were established in a situation in which a downward trend in fertility had already begun. Thus, it seems that where family planning programmes have been successful, they have been so only in special and uncommon circumstances. Second, even in these "successful" programmes the age and parity distribution of acceptors is such as to indicate that family planning is used by couples who already have large families and may, therefore, be highly sensitive to incremental births. For example, in Korea, only 27 per cent of women accepting an IUD had less than 3 living children and 32 per cent had five or more. Thirdly, it appears that in many cases there are significant numbers of contraceptive users prior to the beginning of national programmes although the form of contraceptive practice is often inefficient and unsatisfactory, e.g. in Ceylon 41 per cent had practised family planning before their loop acceptance, but 31 per cent of these used abstinence, and in Taiwan, KAP (Knowledge, Attitude and Practice) sample survey statistics indicate that in 1965, essentially before the programme, 22.8 per cent were currently using contraception and 26.6 per cent had used it at some time in their lives.

These three points imply that the initial few years of the "successful" programmes are not true indicators of the input-output relationships involved, since the ratio of family planning resource input to couple/years of protection output is unsustainably low. Thus, the level of programme activity would have to rise for yet another reason in order to maintain the current low level of impact. A possible countering argument is that much of the family planning activity to date has moved people closer to the decision margin to use contraception. The possibility would follow that future activity

might be considerably more productive since, with large numbers already at the decision margin, only small additional efforts would be required to push them over the margin and recruit large numbers of acceptors.

Experience with the acceptance and spread of behavioural change in other areas, e.g. agricultural innovation in seeds and the adoption of new techniques of production, indicates an "s" shaped pattern of acceptance in which an initial period of slow acceptance is followed by a period of rapid and then by a concluding period of slow adoption as saturation is approached. The crucial question is, of course, how early in the life cycle of adoption this saturation or slackening occurs, i.e. after what per cent of the relevant population has become users of the innovation. This is a question of how resistant and how large is the group of innovation avoiders. On the other hand, there is probably a take-off point, or a point at which acceptance is sufficiently widespread so as to have changed the psychological and cultural climate of adoption and produce a situation in which social change is self generating. The problem faced by family planning programmes may be thought of in terms of a race between this saturation range and the take-off point. If the saturation or momentum-loss point is less than the take-off point, the programme encounters diminishing returns short of required levels and the country finds itself in a demographic trap which produces excessive population growth rates largely beyond the control of the family planning programme.

Contraceptive Innovation

A host of economic, social and cultural factors and forces control or determine the location of the saturation and take-off points. One variable which may be manipulated to modify both these points is contraceptive technology. Their sensitivity to contraceptive technology is evidenced by the response of family planning to the IUD. The IUD is credited with having stimulated a wholly new level of effort, improved the morale of family planning workers and brought about the development of family planning organisations in a form and magnitude not previously known. It is, thus, important to ascertain the probability that an innovation in contraceptive technology will provide in the short run a significant boost to the family planning movement.

Professor Uif Borell[1] reviews the present contraceptive technological know-how in a background paper, submitted to the Conference on Aid Relations in Population at the OECD Development Centre in November, 1969. It may be worthwhile to repeat his summary conclusions:

"In summary, it may be concluded that prospects do not seem very promising as regards a sudden breakthrough in contraceptive methods based on hormones, other chemical substances or immunological methods. Toxicity studies on animals constitute the necessary first step and are quite time-consuming. Then comes the clinical experimental stage, investigating short and long-term effects on human beings. This phase is particularly important as data from experiments on animals are of a limited relevance as to the mode of action on human beings. Present rules as to clinical experiments vary, but are very restricted in many of those developed countries where the potential is greatest for developing improved contraceptive techniques. This would seem to imply that no new method of the kind discussed will be ready for efficient use in mass scale programmes during the next five to ten years.

" Quicker results might be expected in improving surgical techniques, particularly as regards temporary sterilisation. However, by definition, this method will require medical personnel which is in desperately short supply in the less developed countries.

"It may well turn out to be the most efficient use of available staff and money to concentrate efforts on basic research in the field of reproductive endocrinology and physiology. The present knowledge in this area is surprisingly limited. Completely new approaches may yield higher returns on investments in shorter time than a continued concentration of available resources along the lines of much of today's clinical research.

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(1) Professor of Gynaecology and Obstetrics at the Karolinska Institute, Stockholm.

"In the meantime, more effort should go into improving the most efficient and the best accepted of presently available contraceptive methods. In addition, much can be done to improve the use of some of these methods. For instance, recent data support the idea that the efficiency of the IUD can be substantially increased through improved training of staff, better selection of cases, increased information to patients, and - above all - improved follow-up."

Chapter V

POPULATION ISSUES IN A WIDER PERSPECTIVE

Recently the question has been raised, whether current family planning programmes, based on voluntarism, will succeed in bringing down births to the desired numbers at the family level with sufficient swiftness. Economists and demographers are in general agreement that the present level of effort will have to be substantially increased to meet even modest targets for fertility decline. Data presented in preceding chapters of this report support this view.

One may also look at this issue from a more comprehensive angle and go one step further: no sooner have the United Nations accepted the knowledge about and access to means for planning the family as a fundamental human right, than development planners start seriously questioning whether the sum of children, even if successfully planned at the family level, will not exceed the numbers acceptable at the national level. At the far end of this perspective, the question emerges if and when zero population growth rate may become a socio-economic necessity. How could that be achieved? This issue touches upon fundamental ethical values which go far beyond the technical and administrative discussions of today's population debate. There is another aspect of this problem. In the technologically most developed parts of the world there is a growing awareness that the much talked about population issue may not necessarily be somebody else's problem. It is obvious that the demographic variable, as a complicating determinant of development takes different shapes in different societies, depending upon the socio-economic and technological stage of development at which these nations find themselves. It is equally clear that public

attention initially tends to focus on the immediate and seemingly most alarming aspects of the problem, such as "the population explosion and world famine by year x." There is growing evidence, however, to suggest that the longer-run and so far less conspicuous issues of the relation of population growth to overall environmental resources to patterns of human personality development and behaviour, and to the humane running of society, may have more far-reaching consequences and be considerably more complicated to solve. The fact that a rapid ecological deterioration, including scarcity of usable air and water, appears to constitute one of the major features of today's sophisticated industrialised society, seems alarming enough. The population increase is by no means restricted to the developing countries. Ever growing numbers of people with ever growing demands are born in the rich parts of the world as well. Granted, the demographic pattern is quite different from what we know in the developing countries, but nations such as the Soviet Union and the United States increase at a rate which implies a doubling of their populations in some sixty five years. Not only does this represent a rapid increase, measured in a long-term historical perspective (cf. Chapter I), but each individual in the more advanced countries draws much more heavily on limited natural resources than his counterpart in the developing world. Again, the hitherto somewhat academic question "zero population growth rate - when?" takes on new dimensions.

The objective of this report has been to deal with some aspects of the impact of demographic growth upon economic development mostly in the developing countries. We find it crucial, however, to underline that the population issue does not confine itself to any given boundaries; it already has global implications of a socio-economic nature and may well lead to political repercussions, if not dealt with in realistic terms. International assistance in this particular field should indeed be looked upon as pragmatic co-operation, a two-way road, where "donors" and "recipients" collaborate towards common goals.

A high priority for this international co-operation will be to assess the impact of institutionalised family planning on population growth over time. Remembering that the time penalty is particularly severe in the demographic field, development planners and decision makers must be provided with optimal information with the shortest possible delay about what developments can be expected with regard to demographic growth over time.

ANNEX I

AGENCIES PROVIDING ASSISTANCE IN POPULATION/FAMILY PLANNING

CONTENTS

I. Governments

II. Multilateral Agencies

III. Private Foundations and Organisations

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Ford Foundation
Population Council
Rockefeller Foundation
Pathfinder Fund
American Friends Service Committee, Inc.
Asia Foundation
Christian Aid
Church World Service
Commonwealth Fund
Co-operative for American Relief Everywhere, Inc.
Hugh Moore Fund
Japanese Organisation for International Co-operation in Family Planning
Josiah Macy Foundation
Lalor Foundation
Lutheran World Relief, Inc.
Mennonite Central Committee
Milbank Memorial Fund
Nuffield Foundation
Oxford Committee for Famine Relief (OXFAM)
Population Association of America
Population Crisis Committee
Population Reference Bureau
Unitarian Universalist Service Committee, Inc.
Victor-Bostrum Fund
World Neighbors
Brush Foundation
Sunnen Foundation

I. Governments

Belgium	Office de la Coopération au Développement, 55, avenue de la Toison d'Or, BRUXELLES
Denmark	Ministry of Foreign Affairs, Secretariat for Technical Co-operation with Developing Countries, Amaliegade 7, 1256 COPENHAGEN, K.
Finland	Bureau for Technical Assistance, Ministry of Foreign Affairs, Hallituskatu 17, HELSINKI 10.
Germany	Ministry for Economic Co-operation, Kaiserstrasse 185, D-53 BONN.
Japan	The Overseas Technical Co-operation Agency, No.42, Honmura-cho, Ichigaya, Shinjuky-ku, TOKYO.
Netherlands	Ministry of Foreign Affairs, Technical Assistance Department, Versteegstraat 2, VOORBURG.
Norway	Norwegian Agency for International Development (NORAD). Dronning Mauds gate 11, OSLO - DEP.
Sweden	Swedish International Development Authority (SIDA) 105 25 STOCKHOLM.
Switzerland	Delegate for Technical Co-operation, Federal Political Department, Palais Fédéral, 3003 BERNE.

United Kingdom	Ministry of Overseas Development, Eland House, Stag Place, LONDON, S.W.1.
United States of America	United States Agency for International Development (USAID) Department of State, WASHINGTON, D.C. 20523.

II. Multilateral Agencies

United Nations	United Nations Building, NEW YORK, N.Y. 10017, USA.
WHO	1211 GENEVA 27, Switzerland
UNICEF	United Nations Building, NEW YORK, N.Y. 10017, USA.
ILO	CH 1211 GENEVA 22, Switzerland.
FAO	Via delle Terme di Caracalla, ROME, Italy.
UNESCO	9, place Fontenoy, PARIS - 7e, France.

International Bank for Reconstruction and Development (IBRD)

1818 H Street N.W.,
WASHINGTON D.C. 20433, USA.

Organization of American States (OAS)

Pan American Union,
WASHINGTON 6, D.C., USA.

Organisation for Economic Co-operation and Development (OECD)

Development Centre,
94, rue Chardon Lagache,
PARIS - 16e, France.

Colombo Plan

12, Melbourne Avenue,
COLOMBO 4, Ceylon.

III. Private Foundations and Organisations

International Planned Parenthood Federation (IPPF)

18-20, Lower Regent Street,
LONDON, S.W.1. England

Ford Foundation

320 East 43rd Street,
NEW YORK, N.Y. 10017, USA.

Population Council

245 Park Avenue,
NEW YORK, N.Y. 10017, USA.

Rockefeller Foundation

111 West 50th Street,
NEW YORK, N.Y. 10020, USA.

Pathfinder Fund

1575 Tremont Street,
BOSTON, Mass. 02120, USA.

American Friends Service Committee Inc.

160, North Fifteenth Street,
PHILADELPHIA, Pennsylvania 19102, USA.

Asia Foundation

P.O. Box 3223,
SAN FRANCISCO, California 94119, USA.

Christian Aid

P.O. Box No.1,
LONDON, S.W.1. England.

Church World Service

475 Riverside Drive,
NEW YORK, N.Y. 10027, USA.

Commonwealth Fund

Harkness House,
1 East Seventy-fifth Street,
NEW YORK, N.Y. 10021, USA.

Co-operative for American Relief Everywhere Inc. (CARE)

660 First Avenue,
NEW YORK, N.Y. 10016, USA.

Hugh Moore Fund

24th Street and Dixie Avenue,
EASTON, Pennsylvania, USA.

Japanese Organisation for International Co-operation in Family Planning

Hoken Kaikan, 1-2 Ichigaya Sadohara-cho,
Shinjuku-ku,
TOYKO, Japan.

Josiah Macey Foundation

277 Park Avenue,
NEW YORK, N.Y. 10017, USA.

Lalor Foundation

4400 Lancaster Pike,
WILMINGTON, Delaware 19805, USA.

Lutheran World Relief, Inc.

315, Park Avenue South,
NEW YORK, N.Y. 10010, USA.

Mennonite Central Committee

21 South 12th Street,
AKRON, Pennsylvania 17501, USA.

Milbank Memorial Fund

40, Wall Street,
NEW YORK, N.Y. 10005, USA.

Nuffield Foundation

Nuffield Lodge,
Regent's Park,
LONDON, N.W.1. England.

Oxford Committee for Famine Relief (OXFAM)
247 Banbury Road,
OXFORD, England.

Population Association of America
P.O. Box 14182,
Benjamin Franklin Station,
WASHINGTON D.C. 20044, USA.

Population Crisis Committee
1730 K Street N.W.,
WASHINGTON D.C. 20036, USA.

Population Reference Bureau
1755 Massachusetts Avenue N.W.,
WASHINGTON D.C. 20036, USA.

Unitarian Universalist Service Committee Inc.
78 Beacon Street,
BOSTON, Massachusetts 02108, USA.

Victor-Bostrom Fund
1730 K Street N.W.,
WASHINGTON D.C. 20006, USA.

World Neighbors
5116 N. Portland,
OKLAHOMA CITY, Oklahoma 73112, USA.

The following additional organisations are reported to be active in the field of population and family planning. However, no detailed information on their work was received before drafting this report:

Brush Foundation

Sunnen Foundation

ANNEX II

CURRENT AND PROPOSED POPULATION/FAMILY PLANNING RESEARCH IN UNDERDEVELOPED COUNTRIES

The research in the annex is divided into two sections. The first section deals with research within the United States at the major demographic research institutes. The information contained in it is almost entirely the result of personal interviews with institute directors and the researchers themselves supported wherever possible by written research prospectives and preliminary drafts. The materials reported upon are selective, the intent being to provide examples of the more innovative research taking place under the different categories.

The second section reports on research outside the United States and concentrates upon that being done in the underdeveloped countries. Most of this material was gathered by questionnaires, a facsimile of which is given in section 3. Because this research may be less well known, we have not been selective but have presented most of the studies reported to us.

The studies which are reported refer to current and proposed research. The material in this annex is organised according to the following outline:

1. CURRENT AND PROPOSED POPULATION/FAMILY PLANNING RESEARCH IN UNDER-DEVELOPED COUNTRIES - UNITED STATES

(for full addresses of Institutes refer to pages 131 to 136)

A. DEVELOPMENT AND POPULATION GROWTH

Economic Development

International Demographic Statistical Center - U.S. Census

The Center is developing a general application model connecting demographic phenomena with economic and social development. Flexibility is achieved through the development of a simple interaction core model around which are built more elaborate sector models such as education, health, housing, etc. The model is being built so that the direction of causation from economic development to population dynamics is included as well as the more usual direction from population to economic development. This allows an analysis of both the impact of alternative demographic patterns upon, e.g. education, health, income, etc., and the impact of these changes upon demographic patterns.

Another feature is that both a supply and a demand constraint are introduced.

In the construction of the economic model, the points of contact between economic and demographic development have not been worked out, thus it appears that the integration between the two may come at a later rather than at the preferred initial stage of conceptualisation.

Carolina Population Center

A number of investigators at the Carolina Population Center are collaborating on a very ambitious study which attempts to first determine and then quantify the population element in each of the sub-systems which determine the goals of the society. The aim is to develop a new concept of an "optimal" population where the "optimal" is a dynamic concept and is that population size and growth which maximizes the community preference function. The study is ambitious because the determination of the interaction of population with the relevant variables in each sub-system determining a social goal (e.g. increasing per

capita income, social stability, educational advancement, etc.) is very difficult, especially in some disciplines which have not traditionally thought in these terms; the quantification problem is immense; and the weighting of individual goals to form a community preference function is most treacherous. The current status of this project is in doubt as the principle investigators have left the Center.

Philippine Population Study Group

A relatively large economic-demographic interaction model has been estimated from Philippine data and the effects of alternative fertility trends upon economic development have been simulated up to the year 2000. The model is in the Coale-Hoover-Newman tradition. It differs from earlier models, however, in that it includes a higher number of experimental parameters, achieves a higher degree of disaggregation (the savings section is broken into three sectors and the economy into five sectors) and it experiments to a greater extent with alternative parameter values and patterns of values.

Population Studies Center, University of Pennsylvania

The Center is currently engaged in two major research projects. The first is World Manpower: Growth and Changing Structure in the Postwar Years, and the second is Demographic and Economic Effects of Population Pressure in Rural Areas. The first deals with patterns and processes of growth and structural change of the labour force associated with economic growth and population expansion, with special reference to developing countries. Data have been collected from the postwar population censuses of all countries of 500,000 or more inhabitants. Patterns of the variations in labour force participation rates and status characteristics of the labour force are being identified and associations between these and the economic, social, and demographic characteristics of the countries are being analysed.

The second project deals with the nature and causes of demographic and economic responses to high rates of natural increase. The data is gathered from agricultural regions in the underdeveloped countries and a comparison is made with periods of rapidly declining mortality in the past history of currently developed countries. Duration: 1967-1970.

Social Development

Philippine Population Study Group

A model of the impact of alternative changes in demographic conditions upon the economic position of the family is being developed. The model examines the economics of the family in a longitudinal or life cycle sense. Empirically determined parameter values will supplant test values in the final stage. The study is interesting in that it is an attempt to move to the micro level and examine the issues of family planning at this level.

B. METHODOLOGY AND STATISTICS

Development of Computer Programmes

Computer programmes for demographic analysis, data storage and evaluation, population projections, etc. are being developed at a number of points. Little or no co-operation and/or co-ordination of activities is apparent.

International Demographic Statistics Center - US Census

This activity involves: a) the development of a data bank, a computerised storage, retrieval, and evaluation system for demographic and selected economic and social data; b) the construction of computerised techniques and programmes for population projections with maximum parameter flexibility; c) the development of programmes for evaluating demographic, social and economic consequences of population policies; d) the development of procedures, techniques and assumptions to estimate the costs, and commodity and personnel requirements to carry out alternative family planning programmes to target level; and e) the standardisation of fertility data, especially from clinical reports, as a tool in evaluating family planning programmes.

Community and Family Study Center

The Center is developing computer programme "packages" for use in other centers in the areas of fertility and family planning.

University of California - Berkeley

Professor Keyfitz of the Department of Demography has been preparing package programmes for demographic analysis and experimentation.

Primary data collection and methods for obtaining data

Baseline Studies

Baseline studies are being carried out in selected countries. For example, in Gambia a mortality baseline study is underway in order to observe the potentially great impact on infant and child mortality of the measles and smallpox vaccination programme. Mortality data is also being collected in the various vital events data surveys. Of methodology interest here is the proposed Epidemiological Demographic Survalence Data Collection system, an extension of the malaria survalence techniques and involving the collection, on a house to house basis, of demographic and health data.

Baseline studies in fertility would include such studies as the West Malaysian Family Survey and the baseline demographic work of Dr. Cho for the Department of Statistics and the National Family Planning Board using vital statistics, the national system of identity cards and the household surveys; the National Demographic Survey in the Philippines; and the Turkish and Singapore fertility sample surveys. These activities have a high data collection content and are also being used for establishing baselines and for analysing fertility determinants and correlates. Work on experimental programmes for data collection and the development of the methodology and mathematical techniques needed to attack the problem of data unreliability will be moved forward through the work of the Carolina Population Center's "population laboratories".

D. MORTALITY

United Nations Population Division

A survey of world mortality conditions will be conducted by the United Nations as a part of its bi-annual report on the "World Population Situation". A later more concentrated review of world mortality including infant mortality and a re-examination of "model life tables" may be undertaken.

Carolina Population Center — A study of the mortality transition in Europe from an epidemiological standpoint is being formulated by Dr. Omran. The time patterns of disease by causes and their sensitivity to changes in economic or medical conditions are to be traced. This study might have predictive importance for the current mortality transition and might contribute to the current argument as to the relative weight to be assigned economic vs. medical factors in the spectacular mortality declines of the post war period.

The International Population and Urban Research Institute — The Institute has been engaged in research on mortality which has involved the development of a series of historic life tables for several Latin American countries. This work is contributing in turn to an analysis of the completeness of rural death registration, the impact of mortality change on fertility, and the analysis of the determinants and implications of demographic dynamics in these countries.

United Nations Population Division — The Population Division is doing a study on the relationship of infant and early childhood mortality to fertility levels and change.

E. FERTILITY

Research in the determinants of the level, differentials and changes of fertility occupies a place of considerable prominence in the field. Among such studies are the following:

Princeton University — An Analysis of the Decline of Fertility in Europe by Province. This is the well known historical fertility transition study correlating socio-economic-demographic variables with fertility decline by province in Europe.

Harvard University

Rural India Field Study on Population. This study is at a more micro level in the sense that it attempts to examine at the individual and family level such fertility variables as perceived levels of child mortality and perception of the social and economic effects of past population increase.

Food Research Institute

Socio-economic Factors in the Reduction of Natality in Less Developed Areas. This study is attempting to determine by region the empirical level, or threshold, and mix of socio-economic variables which are associated with fertility decline and to use these thresholds to predict the pattern, rate, timing and lower asymptote of fertility reduction where it has not yet occurred within the region. One innovation is the use of curvilinear regression. Interestingly, social indicators are proving to be better predictors than economic indicators and urbanisation is not emerging as a good predictor. No family planning variables have been introduced and longitudinal studies to examine the changing level and mix of the threshold and the possible role of family planning inputs have not yet been carried out.

The Community and Family Study Center and CELADA

Comparative Rural Fertility of Selected Latin-American Countries. The Community and Family Study Center in co-operation with CELADA and national institutions in participating countries are carrying out a comparative rural fertility survey in four to six Latin American countries ranging over the scale of socio-economic development.

The survey will collect data on the level of fertility, KAP, social factors, e.g. legal and consensual marriages, economic factors, social structure factors, social-psychological variables, e.g. communication, wife-husband relationship, traditionalism. The international comparative work will be done by CELADA.

The International Population and Urban Research Institute

This is a study concerned with a comparative analysis of family structure classified by rural-urban, and married and consensual unions in three or four Latin American countries and their influence upon fertility, marriage, employment,etc.

Harvard University

Interrelationship Between Fertility, Mortality and Other Factors. This study is a continuation and elaboration of Professor Heer's significant work on the interrelationships among fertility, child and infant mortality, and sex preference for family survivors which demonstrates the importance of mortality decline as a variable determining fertility. It is an attempt to correlate the interrelationships among these factors and, in addition, fertility attitudes, perceived levels of infant and child mortality, educational attainment, and economic status. Interviews in selected societies provide the data.

RAND Corporation

Longitudinal and retrospective data from Pakistan is being examined to see if after standardising for parity and age, infant and child death results in shorter open intervals.

RAND Corporation

Quantitative Fertility Determination Models. The development of quantitative fertility models, "household decision making model", are being pursued at RAND. Regression models from regional cross-sectional data have been developed to test the statistical relationship between fertility levels and environmental variables. The environmental variables of recurring significance are infant and child mortality, per cent of children in school, labour force participation of women and children, and where it has been possible to include, family planning inputs. In this study, urbanisation has proved to be of small explanatory value.

Similar type analysis is being applied to other countries. For the Philippines a simultaneous system is being developed to analyse the interrelationships among marriage, fertility, labour force

participation, earning and migration. A model to explore the interrelationships between family income sources, fertility, migration and marriage has been developed for Puerto Rico.

Several lines of research seem to be converging on the thesis that the effective manipulation of fertility involves the manipulation of the family environment, i.e. that it involves change in the social milieu. One variable in this environment which appears to be crucial as a prerequisite for fertility reduction is a decline in infant and child mortality. Another thread which is emerging is the necessity and crying need for research at the micro or family level. Awareness is also increasing that a change in the pattern of family formation, marriage and reproduction, requires that a broader battery of variables be affected than has been usually considered in conventional family planning programmes.

United Nations Population Division

Study of Differential Fertility. Work has begun on the study of variations in levels and trends of fertility in relation to education, public health and other social, economic and environmental factors with particular reference to developing countries. The commencement date for this project was 1969.

Another study by the Population Division deals with the changing patterns of fertility differentials produced by family planning programmes with reference to the demographic, social, economic and psychological factors involved. Study programmed for 1970-71.

Other research endeavours of the Population Division include the revision of the provisional report on "Measures, Policies and Programmes Affecting Fertility"; and a study on the relationship of infant and early childhood mortality to fertility levels and change.

F. FAMILY PLANNING

Fertility Impact

Population Studies Center - University of Michigan and Taiwan's Population Studies Center

These two Centers are engaged in a continuing analysis of the data emerging from the Taiwan Family Planning Programme.

This activity includes a study of the relationship of IUD acceptors to 590 variables, e.g. family planning, economic, social, and demographic, for 361 local areas in Taiwan. The relationships are being analysed by multi-variate analysis. Similarly, the influence of these variables including IUD acceptance rates upon fertility levels and changes in fertility levels is being investigated.

In another study, survey data is being used to measure the past fertility of acceptors in order to determine the extent to which acceptors are selected for high fertility and thereby the potential impact on fertility of an IUD programme.

Community and Family Study Center

This Center is developing a technique to estimate the number of births averted per unit of contraceptive with a much less elaborate system than the life-table technique in terms of the parameter induced data demands. It is based upon the decomposition, including decomposition by contraceptive device, of the ratio of number of pregnant women to total women.

In a related study, the Center is also attempting to develop a simple and flexible system to estimate the number of women needed, in terms of the number of couple years of perfect contraception, to achieve a given fertility goal.

Programme Evaluation, Administration and Budgeting

Pennsylvania State University

Cost-Benefit Analysis of Family Planning. A study at Pennsylvania State University aims at the development of a general cost-benefit model to be used in evaluating family planning programmes. It hopes to develop, from empirical data, a summary set of cost-to-performance

ratios by programme, contraceptive method, type of campaign, and socio-economic setting to be used in the construction of an "optimal programme.

RAND Corporation — A different sort of cost-effectiveness study has been pursued at RAND for the Taiwan Programme which involves the use of programme inputs in regression analysis on regional fertility differences.

Johns Hopkins University — A cost-benefit evaluation of the Pakistani programme is underway, including an analysis of the cost-benefit of various contraceptive devices and programme activities within a framework designed to yield an approach to the optimum programme.

Community and Family Study Center — Family Planning Resisters. This research, while drawing on US data, will be of general interest. The work involves an intensive psychological and sociological study of resistance to family planning. It is felt that the traditional approach to the study of innovation has not adequately dealt with an explanation of the failure to adopt. Thus, what is desired is a theory of failure and how behaviour might be changed. The approach is to learn the social, demographic, attitudinal and motivational characteristics of resisters and to experiment with new theories of attitude change in order to modify the attitudes and behaviour of these resisters.

Carolina Population Center — Systems Analysis Approach to Population Planning. This work involves the application of systems analysis as a tool for the policy decision maker and administrator in the design, implementation and evaluation of population policies and action programmes. It develops a socio-economic model to determine optimal paths to given goals via quantifying the effects of alternative population policies on the growth of population, gross national product, and other socio-economic variables. It

includes a policy game to train population planners to design and evaluate policies.

Even if, as appears likely, this very ambitious proposal cannot be realised in the detail and disaggregation proposed (e.g. it envisages regional and urban breakdowns, a variety of socio-economic variables, and includes population as an endogenous variable), it represents an interesting attempt to apply a particular tool - systems analysis - to the demographic problem.

Ethics in Population Programmes

Carolina Population Center	Ethics in Population Programmes. This study attempts to determine, by standardised interview schedule (a la KAP studies), attitudes toward "demogenic" policy and to examine, via seminars, the ethical-moral-philosophical issues emerging from those policies.
Harvard Center	Ethics in Population Programmes. This proposed study is also involved with the ethical implications of population control programmes, especially where population control is understood to go beyond individually determined family size to publically determined policy toward fertility control and ultimately population "control".

H. CONTRACEPTIVES : NON-BIOLOGICAL ASPECTS

Acceptor Characteristics

Most current work appears to be concentrated upon IUD acceptance. Several of the national programmes, e.g. Ceylon, India, Korea, Malaysia, Pakistan, Taiwan, are carrying out IUD acceptor analysis.

The Family Planning Evaluation Unit of the Family Planning Bureau in Ceylon, for example, is carrying-out loop follow-up studies with such characteristics as age, number of living children, education, source of loop information, degree of satisfaction, reason for use (e.g. spacing, limitation, termination) prior contraceptive experience, and post loop contraceptive practice.

The National Family Planning Board of Malaysia intends to do a follow-up on all IUD dropouts in the Pilot-Study Project at Tg. Karang.

Population Studies Center - University of Michigan and the Taiwan Population Studies Center

The Population Studies Centers - University of Michigan and Taiwan are collaborating on similar work for Taiwan. Their studies are designed to estimate the influence on IUD acceptance rates of: characteristics of the programme; population and area; post IUD termination contraceptive behaviour; and socio-demographic differentials in acceptance rates; termination rates and related fertility rates. The data comes from medical follow-ups in Taichung, and the three sample surveys of IUD acceptors in 1965, 1966, and 1968.

Evaluation of Devices

Device evaluation is occurring in many of the national and some private agency programmes. In addition are the international programmes.

The Pathfinder Fund

International IUD Programme. This is an especially well conceived study designed to collect, evaluate and via computer programming, provide almost instant feedback to participating medical informants in the field data on a variety of variables involved in evaluating IUD's. Data on age, marriage duration, place of residence, number of live and still births, induced and spontaneous abortions, number of living children and other births wished as well as medical information should provide analysts with a gold mine of high quality data. If only information on occupation and education could be added, a wonderful source for analysis of family planning induced changes in differential fertility would be developed.

Population Council

The Population Council has been serving as a clearing house for studies on the analysis of contraceptive devices - IUD, oral tablets, and to a lesser degree, conventional techniques - as well as an important source of data through the Co-operative Statistical Programme for the Evaluation of Intrauterine Devices.

Africa	ECA	Population Trends. The study centers on the demographic situation in the African region. It deals with all population

aspects and includes a review of the demographic contents of the African development plans and projections of population.

Another project will be that of editing and publishing the reports and important papers of the Seminar on Application of Demographic Data and Studies to Development Planning.

Duration: Commencement about 1970.

Asia	ECAFE	Comparative Study of Population and Agricultural Change. The objectives of the study are:

(1) To describe and compare patterns of population change and agricultural change in agricultural areas of various countries.
(2) To clarify more fully the interrelationships between population and agricultural variables by including as many additional variables as might be feasible.

The study will be national case studies with each study centering attention on a number of agricultural areas. Cross-sectional comparisons will be made of different regions in a country and between the different countries selected.

Duration: Commencement 1970.

Latin America	ILPES/ CELADE	Economic Development and Labour Absorption

Since 1967 CELADE and ILPES have been developing a research project on alternative policies of economic development and manpower absorption. The work done includes (a) diagnosis of the main obstacles to economic development in Latin America, including underemployment; (b) projections of changes which would be introduced under policies incorporating alternative development activities; and (c) formulation of and experimentation with a simulation model to determine differential effects and consequences of different behaviour. Once the model had been adjusted to the historical behaviour of the period 1960-1967, alternative projections were carried out in order to answer the following question: Which are the breaches that would appear in foreign trade and in manpower if it is assumed that countries accelerate their income growth from the level reached in the period 1960-67?

The report is being prepared.

Asia IDE Population growth and economic development in Asian countries: China, Taiwan, Philippines, Malaya - Singapore, Indonesia, India and Pakistan.

This project, covering several Asian countries in a five-year study, is a demographic analysis of the population growth, composition, distribution, vital rates, etc. It will also include a socio-economic analysis of the population as to: level of standard of living and income, labour force and employment, industrialisation and urbanisation, population policy and potentialities of economic development.

Duration: 5 years, commencement date unknown.

Staff: Head researcher and ten demographers.

India ULI Demography and Development Digest. This is an inventory of current literature in the field of demography and development, including a list of the work completed and in progress in various organisations engaged in research in the area.

A summary of data on the Indian economy is also given.

Duration: A biennial publication beginning with January-July 1969 and January-July 1970.

Staff: One person engaged in the collection of data.

India IEG Demographic Change in an Industrialising Region of India. Measurement of change in the characteristics of a regional population where major heavy industries, including the steel mills, have been established. Comparative analysis of the data between 1951 and 1961 is being done and will be extended to 1971.

Duration: Continuing project.

Staff: 3 persons.

India IEG Inter-district variation in demographic structure. The measurement of variation in pertinent demographic variables, e.g. age, sex, marital status, education, working force participation, industry composition, migration content, etc., was done for the 316 districts of India; based on the 1961 Census. Detailed analysis is being carried out on a computer.

Duration: Reports to be issued from October 1969 onwards.

Staff: 4 researchers.

India GIPE

The relationship between population and social and economic development: survey and resurvey of six villages.

The interaction among family planning attitudes, fertility and socio-economic change is being studied by tracing each individual under observation through two points in time. The economy is measured in terms of change in income, occupational structure, quality and pattern of agriculture, etc. Migration is employed as a link variable between economic and demographic factors.

Duration: 1966-1970.

Staff: 1 researcher for 4 years, 2 researchers for 3 years, plus clerical staff.

Kenya IFO

Population trends in Kenya and their implications for social services in rural and urban areas.

Duration: Completion approximately May, 1970.

Staff: One field investigator.

Mexico CEED

Regional Development in Mexico. 1876-1960. The study investigates the interrelationship of economic, social and demographic factors on the regional development and the importance of each of these to the development of Mexico.

Staff: 5 persons.

Republic of Senegal ORSTOM

Differential Study of Two Zones of 30,000 Inhabitants. The objective is to study the relationship among demographic, economic, social and geographical factors in the two regions.

Duration: To end October 1969.

Staff: 2 persons.

South Pacific ANU

Demographic Studies of Island Populations in the South Pacific. The research project will focus on three major areas:

(a) structure and growth of the New Guinea populations;

(b) changes in the pattern of fertility and mortality, and their implications;

(c) demographic and socio-economic characteristics of urban populations in Fiji and their changes between 1956 and 1966.

Duration: The New Guinea and Fiji studies will be completed by 1971 while the study on fertility and mortality will be continuous.

Staff: 2 full-time and 2 research assistants not necessarily full-time.

Tanzania — UCT — Population Density in the Mountain Lands of Tanzania. The study deals with the effect of population growth in areas of high population density, change in age/sex composition in mountain rural areas, and change in family size and child spacing.

Duration: End 1970/71.

Staff: 2 persons.

Thailand — CU — Survey of Social, Economic and Demographic Change in Thailand. Chulalongkorn University is undertaking, as part of the input for a training programme, a longitudinal survey of social, economic and demographic change in Thailand. In addition, cross-sectional and repetitive special surveys are to be taken to examine dynamic relationships, e.g. does the falling death rate result in increased pressure on land and household size and thus on migration? The aim of the study is to determine the interrelationships between social, economic and demographic change and the change over time which have occurred in these relationships.

Social Development

Developing Countries — IIEP — The International Institute is continuing the work initiated by the Population Council with its case studies of the impact of demographic trends upon the attainment of educational goals in Pakistan, Korea and Ceylon. The Institute is engaged in a study along the general lines of examining, via the development of a demographic model, the implications for educational development, teacher requirements and the sensitivity of education costs to population increase and educational deepening.

Developing Countries	UNSA	Provision of Facilities for Children and Young People in Relation to Prospective Population Growth in Developing Countries.

The study examines population projections for nine developing countries and evaluates the effects of future fertility and mortality trends upon the needs of children and young people (aged fifteen to twenty-four) for health facilities, schools, teacher, food, etc. The study is carried out for the following countries: Ceylon, Chile, Ghana, Iran, Jamaica, Mexico, Morocco, Thailand, and the United Arab Republic.

The first part of the report, which is already completed, gives a review of the demographic situation in the nine countries and considers the effects of the future alternative fertility and mortality trends on the size and age composition of the population.

General	UNESCO	A study on the relationships between education and fertility is continuing. A second section, dealing with the "critical mass" of education necessary to ensure the institutionalisation of family planning, is planned.
India	GIPE	Study of the Relation Between Education and Economic Development. A regression analysis will be employed to study the relation between education and economic development as found in terms of certain socio-economic indicators for various districts of the country. Duration: To be finished in 1970. Staff: One junior research assistant.
Japan	MHW	Study of a Social Development Programme within the Population Policy Programme. This project is to study from the viewpoint of changes observed in respect to population structure (e.g. age-sex structure) present and future social development programmes within population policy programmes.

Sierra Leone — FBC

Economic Development and Population Growth in Sierra Leone. Basic demographic, social and economic data are being examined to suggest the nature of the relationship between population and social-economic development.
Duration: Manuscript due 1969.
Staff: 3 persons.

Sierra Leone — FBC

A Profile of Sierra Leone. This study is very general in scope and covers several factors in brief and should serve as an introduction to the demographic and economic situation in Sierra Leone. Some of the areas to be covered in this profile are: fertility, mortality, migration and urbanisation, and family planning.

Duration: The project is nearing completion and will be published by the Population Council and Colombia University.

Staff: One person.

Tanzania — IFO

Education and Economic Development of a Tropical Agrarian Country - the Example of Tanzania.
Field investigations.
Duration: 2 years with completion approximately mid-year 1971.
Staff: 1 full-time person.

Tunisia — PI/HFRP

Growth and Development of Children in Tunisia. The present research plan is four-fold:
(a) to complete a feasibility study in nutrition of infants in the post weaning period in order to identify obstacles to a larger long term study of feeding practices in relation to socio-economic backgrounds; (b) to obtain background information on physical health and physical and mental growth of a sample of infants from birth to 2 years of age, stratified by social class; (c) to obtain from parents of these infants and from a sample of others interviewed in 1967, data on basic economic and social factors and on such variables as expectations for one's children, the sense of control of one's destiny, the meaning of children to the parents and the

willingness to accept change in the presence of alternatives; (d) to make some special analyses of a sample of the census returns now in hand.

Duration: Six month study commencement date unknown.

B. METHODOLOGY AND STATISTICS

Argentina ITT

Basic Demographic Studies. The studies are being done in order to elaborate the historical series of indices and demographic facts and to evaluate and correct the life tables.

Duration: Started in 1968.

Staff: 1 part-time person.

Asia IDE

Evaluation of Demographic Data of Asian Countries. The objectives of the study are:

(a) evaluation of the accuracy of census and vital statistics data;
(b) estimation of vital rates:
(c) populations projections;
(d) re-compilation of demographic data in time series.

Duration: 2 years from 1969.

Staff: 8 persons.

Egypt RCDTR

Estimation of Vital Rates by Using Sample Surveys. The study is continuing the analysis of the data obtained through a sample survey conducted in Lower Egypt. The object of this survey is two-fold: (1) to test the technical and administrative feasibility of estimating vital rates by defining sample areas, and (2) once these areas are defined, applying intensive survey procedures based on repeated household visits in order to obtain a complete recording of all births and deaths. The project has been enlarged to obtain additional information on fertility in order to enrich the analysis and to provide a better insight to fertility.

Ghana ISSER Analysis of Birth and Death from the Compulsory Registration Areas of Ghana (1962-67). This research activity is undertaken to study: (a) the patterns of mortality, (b) the seasonal variation in births and deaths, and (c) the completeness of births and deaths registration and their possible adjustments.

Duration: One year.

Staff: One full-time researcher.

Ghana ISSER Estimation of Vital Rates by the Use of Interpenetrating Sample Designs. This sample survey project being done in the eastern region of Ghana will use the technique of interpenetrating sampling designed to control non-sampling errors in the field work apart from investigating the possibility of reasonably accurate estimates of mortality and fertility.

Duration: 2 year project.

Staff: 2 full-time researchers.

Ghana ISSER Analysis of Basic Census Data and Other Estimates. The main activity is to examine the recording of age and its accuracy, and to make estimates of working life tables for Ghana.

Duration: One year.

Staff: One full-time researcher.

India ORG Evaluation of Sample Registration Problems at District Level. The study develops and tests methods of measuring changes in vital rates and registration completeness in a district where vital registration is accomplished through probability sample registration areas. The project in its entirety is directed toward establishing methods for measuring year-to-year changes which are useful in evaluating family planning activities as well as for general demographic purposes at the District level in an Indian State. Inherent in this is the discovery of ways to improve the sample registration scheme.

Duration: 5 year study, commencement date unknown.

Japan IDE

Collection of Demographic Data and Information and Retrieval by Using Computer. The study consists of routine data collection for demographic analysis. The data collected are from census, vital statistics and special surveys in Asian countries.

Duration: Continuous.

Staff: Four persons.

Nigeria DTR

Improvement of Census Age Data Collection and Determination of Methods for Improving Data already Collected. A field survey of 10,000 persons in a rural area near Ile-Ife is being carried out to determine the best method of improving data collection and data already collected.

Duration: June 1969 - March 1970.

Staff: 5 full-time persons and 12 part-time.

Philippines PIUP

Pilot Study of Vital Statistics Registration in the Philippines. Chandrasekan-Deming method of approach will be used to evaluate "true" levels of births and deaths in the country and to improve the registration system.

Duration: 1968 - field work, 1969 - Analysis and report.

Staff: 3 persons.

Taiwan TPIFP

Vital Demographic and Registration Study in Taiwan. Simple cross tabulation analysis is being done to establish the vital demographic facts about the population and assess the accurateness of its registration.

Duration: May 1966 - June 1972.

Staff: Approximately 100 with the numbers varying with the different stages of the project.

Tanzania CSB

1967 Population Census. The census investigated demographic and economic characteristics in Tanzania plus housing conditions in urban areas. Demographic analysis will make use of population models and other techniques for incomplete data.

Duration: Planning started in 1969. Main work will be finished by 1970/71.

Staff: Approximately 10 persons.

C. MIGRATION AND URBANISATION

General — IFW

Internal Migration. The study analyses the general implications of economic change on migration policy in countries at different stages of economic development and of different social systems. It also analyses the methods of implementing population redistribution policies, i.e. measures to assist migrants, measures to redevelop declining areas and measures to promote migration into new areas.

Duration: Completed 1969.

Staff: One full-time researcher and one part-time secretary.

Argentina — ITT

Differential Analysis on the Migration in Argentina 1869-1960. The study is an analysis of internal and external movements of migrants and their effect on social-economic structure in the country. The study is to be broken down by occupation, civil status, etc., and is to be based on census and sample surveys.

Duration: Started in 1969.

Staff: one person.

Argentina — ITT

Migration in Buenos Aires, 1855-1960. Analysis of the intensification of the migratory movement in Buenos Aires and its relation to the socio-economic situation is carried out for the years 1855-1960. The study is based on national census by provinces and municipalities.

Duration: Started in 1969.

Staff: One person.

Australia — ANU

Asian Immigration into Australia. A sample survey was conducted to study the history of Asian immigration and settlement in Australia, the Australian reaction to the immigrants, and Australian restrictive legislation on immigration. A comparison will be made with the USA, Canada and New Zealand.

Duration: 1965-1970.

Staff: One full-time researcher and others.

Democratic Republic of the Congo	CEPAS	Continuous Survey on the Movement of the Population of Ndjili. Monthly reporting of the birth, death and migration rate in the district will be done in order to improve the registration and correct errors in the vital statistics. Duration: 18 months beginning June 1st. 1969. Staff: 15 persons.
Ghana	DU	Immigrants in Ghana. The study is a descriptive analysis of the social, demographic and economic characteristics of foreign immigrants in Ghana. Duration: 1969-1970. Staff: Two full-time persons.
Ghana	DU	Migration and its Relation to Economic Growth in Ghana. It is proposed to study migration and its effect on agricultural and industrial development and labour mobility. Duration: Scheduled to begin in 1970. Staff: Three full-time field investigators.
India	GIPE	Economic Regionalisation: Problems and Approaches as seen by a Demographer. The project is studying the following: (a) capacity of states to attract population in the past and present; (b) capacity of the cities to attract population in the past and present; (c) resource potential of the various regions to attract industry and population. Duration: 1969-1974. Staff: 3-4 full-time researchers plus clerical staff.
India	ULI	Characteristics of Migrants in Uttar Pradesh. The composition, origin and rate of migration in the different parts of the State are analysed from the 1961 Census data. The results are used to project the rate of urbanisation along with the composition of migrants in the next 15 years. Duration: September 1969 - December 1969. Staff: One person.

Japan MHW Population mobility and its relationship to socio-economic factors. A sample survey was conducted in 1968 to study the regional mobility of male population, particularly in relation to occupational mobility. Differences of mobility among groups with different backgrounds, that is, residential, educational, initial occupation and so on were also studied.

An intensive analysis will follow to determine any change of migration volume, direction of migration flow, and of occupational mobility since the 1968 survey.

Duration: Survey completed in 1969. The analysis will be conducted in 1970-1972.

Staff: 15 persons.

Malawi IFO Population Trends and Migration in Malawi with Special Reference to the Coastal Region of Lake Malawi.
Field investigations.
Duration: 2½ years with completion in 1970.
Staff: one person.

Mexico CEED Internal Migration in Mexico, 1930-1960.
The study is concerned with:
(a) interstate migration by age and sex groups; (b) rural-urban migration by age and sex groups; (c) migration towards big cities (more than 100,000 inhabitants in 1960) by sex and age groups.

The study is based on census information.

Duration: 1968-1969.

Staff: 2 full-time persons.

Mexico CEED Internal Migration, Mobility and Occupational Structure. The study investigates the socio-economic and demographic characteristics of migrants. Information is obtained from field surveys.
Duration: Started in 1968.
Staff: 5 persons.

Mexico	CEED	The Process of Urbanisation. The study deals with the economic, demographic and social aspects of the process of urbanisation in the last 30 years in Mexico. Duration: 1966-1970. Staff: 8 persons.
Republic of Senegal	ORSTOM	Mobility of the Population. The study is a quantitative analysis of the urban natural increase and urban mobility. Duration: 1969-1970.

D. MORTALITY

Mexico — CEED

Analysis of Mortality by Causes, 1930-1960. The study aims to establish the pattern of the causes of death by the levels of general mortality, construct mortality tables, and make projections of mortality by causes of death. The method of analysis will be descriptive and comparative in nature and will include a cross-section correlation to determine the degree of association between causes of death and socio-economic factors.

Duration: 1968-1969.

Staff: One person.

Republic of Senegal — ORSTOM

Factors of Infant Mortality.
An epidemiological study of infectious diseases which cause infant mortality and an evaluation of the sanitary and curative measures for them.
Duration: Continuous.

Republic of Senegal — IPS

Infant Mortality and Morbidity in Rural and Urban Areas. A longitudinal analysis of infant mortality and morbidity in rural and urban areas is being done to determine the possibilities of including a programme of child care in the national budget.

Duration: Continuous study - rural analysis initiated 6 years ago and urban analysis 1 year ago.

Staff: Approximately 10 persons.

E. FERTILITY

General &	UNESCO	Case studies on the status and social role of women in relation to fertility will be begun in 1969.
Argentina	ITT	Levels of Fertility in Argentina, 1869-1960. The study examines the levels and tendencies of fertility in Argentina by total and by provinces and its relation to other socio-economic factors. Based on the first national census. Duration: Initiated in 1968. Staff: One part-time person.
Colombia	CEDE	Fertility Survey in Colombia. The level of fertility in rural Colombia is analysed in this survey. Various analytical methods are used to establish the interrelationships between various socio-economic variables and rural fertility. Duration: 1969-1970. Staff: Approximately 4 people.
India	DRCB	Post-Partum Amenorrhea - A case study. This study investigates: (a) the length of amenorrhea period; (b) the relationship between lactation and amenorrhea periods among primipara women; (c) the relationship between the nutritional status of the mother and the period of amenorrhea. Duration: Started May 1968, the analysis of the study is still in process. Staff: Staff of the Demographic Research Centre.

India DRC Standard Fertility Surveys in Districts of Bihar. The survey will assess the current level of fertility among rural and urban women in the district and measure the changes in the district over a period of time.

Duration: The time schedule will be from 3 to 5 years.

Staff: 10 persons.

India DRC Spacing of births among Couples of Patna from the information collected in the Demographic Survey of Patna. The analysis involves the factors affecting the spacing of births, e.g. age of mother at marriage and first birth, income of father, education of parents, sex of previous child, religion, etc.

Duration: Started March 1969, expected to be completed end of 1969.

Staff: 2 persons.

India DRC Change in Marital Status in Bihar and its Impact on Fertility. The analysis involves projections of the 1961 marital status data for 20 years based on the assumption that the expectancy of life at birth increases at an assumed rate and how this rate will change the present pattern of marriage and its impact on fertility.

Duration: February 1969 - August 1969.

Staff: One person.

India ULI Fertility Survey of the Rural Areas in the District of Lucknow. A base line survey was conducted (a) to measure the level of fertility in the rural areas of the district, (b) to determine the fertility differentials by social, economic and cultural variables, and (c) to compare the regional difference in demographic characteristics.

Duration: December 1968 - September 1969.

Staff: 4 persons.

India ULI Intensive Fertility Survey of the City of Lucknow. This is a study in depth of fertility behaviour of ever married females in the city. A sample survey was conducted and the information used to (a) examine the cohort and period fertility of females in an urban area, (b) isolate the social, economic and cultural factors responsible for the differences in reproductive behaviour, and (c) examine the rural-urban differentials through another such study. The Brass method was applied to correct misreporting and statistical efforts, while the socio-economic factors were isolated through regression analysis.

Duration: December 1968 - August 1969.

Staff: 4 full-time persons.

Japan MHW A Demographic Estimation of Fecundity of Japanese Women as a basis for Assessing the Effectiveness of Fertility Regulation. This project mainly adopts a demographic method of estimating possible fecundity under a hypothetical condition of non-regulation of fertility for assessing the effectiveness of fertility regulation. By making use of census, fertility data, vital statistics, statistics of notified induced abortions, and some special sample results of couple fertility and practice of contraception, attempts are made first to estimate losses of live births due to spontaneous abortions, and then calculate a probable magnitude of total pregnancies per woman under a hypothetical condition of non-existence of fertility regulation. The fecundity thus determined is analysed with special reference to its secular changes and some socio-economic differentials.

Duration: Started in 1967 with no fixed termination date.

Staff: 2 persons.

Mexico CEED Fertility in Rural Mexico. The study involves the determination of the level of fertility and an analysis of the different factors affecting fertility, e.g. education, income, occupation status, religion, etc. Also includes a KAP survey of contraceptive practice.

Staff: 2 persons.

Republic of Senegal	ORSTOM	Analysis of Fertility. The study is a quantitative analysis of fertility and its determinants, e.g. duration of marriage, age of the women, month of conception, etc. Duration: One year. Staff: One full-time person and two part-time.
Sierra Leone	FBC	Fertility in Sierra Leone. Child/adult ratios are compared with similar ratios in an appropriate series of stable populations and, by interpolation, gross reproduction rates are computed for the Provinces and districts of Sierra Leone. Duration: Project completed and will appear in the Sierra Leone Geographical Journal, University of Birmingham.
Taiwan	IPIFP	Economic Correlates of Fertility in Taiwan. A representative sample survey is being carried out to determine how the dependent variables, e.g. present family size, desired family size, attitudes towards family planning, and use of contraceptives are influenced by such economic factors as income level, income expectations, saving and saving aspirations, consumption levels and consumption aspirations, as well as people's perception of the economic costs and benefits associated with having a large family. Duration: January 1969 - January 1971. Staff: Approximately 76 full-time persons will be engaged at various stages of the research plus an analysis staff of 6 part-time persons for 18 months.

F. FAMILY PLANNING

General OECD

The Development Centre is undertaking a project aimed at helping population programme administrators to improve the efficiency and value of their long-run planning through the development of a series of demographic models, both general and for particular cases, designed to yield consistent sets of interrelated programme targets such as population growth rates, birth rates, couples protected, programme personnel and programme budget targets. In linking these planning targets, the link between couples protected and birth rate is especially interesting and crucial as it involves significant work in the area of evaluation. The links between couples protected and personnel and budgets provides the basic raw material for an estimate of global needs such as that often requested by foreign assistance administrators.

Ghana DU

Attitudes of the Medical Profession to Family Planning. The purpose of the survey is to determine how prepared the Medical Profession in Ghana is to participate in a nationwide programme of family planning.
Similar projects are planned on the attitude of the clergy and the rural female population to family planning.
Duration: Expected completion by October 1969.

India BES

An Input-Output Analysis of Family Planning Programme in Trivandrum District of the State of Kerala. The analysis aims to show the comparative cost differences of a sterilisation and/or IUD insertion among the different primary Health Centres of the District. The reasons for the differentials in the performance between the centres with respect to staff and other variables will be assessed according to the relative efficiency of the different units in terms of cost.

Duration: One year from April, 1969.

India	ULI	Acceptance and Practice of Family Planning and its Relation to Fertility Differentials. The study is designed to verify the extent of regional fertility differentials and evaluate the impact of these differentials on the success of family planning programmes. Duration: June 1969 - December 1969. Staff: 5 persons.
Kenya	UEA	Studies of Maternal, Child Health and Family Planning in Rural Kenya. Collection of information on the need and costs of providing maternal care and contraceptive services to pregnant and puerperal women is being done. Duration: September 1969 - December 1969. Staff: 8 full-time field assistants and 2 full-time office workers.
Pakistan	PARD	7th Annual Report on Comilla Pilot Project in Family Planning. Annual evaluation of the project aims to improve the distributional channels of conventional contraceptives and to make an analysis of characteristics of adopters of different methods of contraception. Duration: July 1969 - January 1970. Staff: One person.
Pakistan	PARD	Case Study of the IUD Clinic under the Comilla Pilot Project in Family Planning. Analysis of the socio-demographic characteristics of the IUD clients. Duration: July 1969 - February 1970. Staff: One person.

Pakistan PARD

Study of the Job Performance of Family Planning Female Organisers in Comilla. The study investigates the factors related to the job performance of female organisers in the Comilla programme.
Duration: February 1970 - June 1970.
Staff: 2 full-time persons.

Philippines PIUP

Pre-Pregnancy Clinic Patient Evaluation. The aim is to identify patients serviced at family planning clinics in the Metropolitan Manila area and ascertain immediate, intermediate and long-term effects of small-scale family planning programmes in this Metropolitan area.
Duration: 30 months beginning 1st October, 1968.
Staff: 6-12 persons.

Pre-Pregnancy Clinic Patient Evaluation
Same as above except on a nationwide scale.
Duration: 30 months beginning 1st October 1969.
Staff: 6-12 persons.

G. DEMOGRAPHIC SURVEYS INCLUDING KAP SURVEYS

Algeria INED

Algerian Demographic Survey. This is a large multi-purpose survey of 70,000 families in Algeria. Longitudinal methods are used to analyse the data on mortality, fertility, economic activity, migration, and education. The mortality data is also being used to develop life tables. In its entirety, the survey is being used as a census substitute.
Duration: Recurring (3-6 month rounds).

Chad INTSH

KAP Project Survey of Chad. The survey aims to measure the degree of family planning and certain socio-economic variables of the inhabitants of Chad in order to predict present and future tendencies of family planning in Chad.
Duration: July 1969 - July 1970.
Staff: Three full-time persons.

Colombia	CEDE	Demographic Survey. The objectives of the survey were to analyse, evaluate and discuss certain demographic variables such as mortality, natality, and migrati in the districts of Colombia. Projection of the population were also made for the districts. Duration: Completed 1969. Staff: 3 persons.
Democratic Republic of the Congo	CEPAS	Demographic Survey of the Village of Kikwat. Classical analysis of a populatio census is done for the village of Kikwat. A demographic survey of the village of Motadi, which will be similar in nature to that of Kikwat, is foreseen at the end of 1969. Duration: 1969. Staff: 20 persons.
Ghana	DU	Demographic Sample Survey. The survey examines the relationships among fertility, mortality, migration and household composition. Brass's mortality and fertility method of analysis will be employed. The survey will also include a KAP study on contraceptive practice. Duration: June 1968 - December 1970. Staff: Approximately 40 persons with the amount varying with the different stages of the survey.
India	BES	Evaluation of Family Planning Activities. Regular KAP survey conducted in Kerala, India. Duration: April 1967 - December 1969. Staff: 2 social workers, 1 research officer and 3 compilers in charge of analysis.

India	BES	Follow-up Fertility Survey. The purpose of the follow-up survey is to find out changes in fertility, knowledge, attitude and practice of family planning as well as preferences of methods. The survey was made in 10 towns and 5 villages. Duration: September 1969 - August 1970.
India	BES	Family Planning Motivation and Acceptance among Workers in Factories and Plantations in Kerala. A random sample survey of couples employed in factories or on plantations will be conducted to learn the reasons, if any, for resistance to family planning, the means to overcome it by successful motivation, and the extent of knowledge, attitude and practice of family planning by the workers. Duration: September 1969 - August 1970.
India	DRC	Demographic Report of Bihar State, 1901-1961. A demographic analysis of the State is being carried out. A report will be issued and will include sections on population size, its growth and distribution during 1901-1961, fertility, mortality, migration, urbanisation and civil conditions. Duration: 1 year, 1969-1970. Staff: 6 persons, each taking responsibility for a different section of the report.
India	DRC	KAP Survey of Bihar State. Some of the objectives of the survey are to determine amongst the couples of child-bearing age: (a) the extent of family planning knowledge; (b) the proportion of the couples practising birth control, and if practising whether within the family planning programme; (c) their satisfaction or dissatisfaction with available services.

India GIPE Family Planning Project II. The study employs survey-resurvey techniques to ascertain the change in the attitudes and practice of family planning in rural areas during 1953-1966.
Duration: 1966-1970.
Staff: 2-3 researchers plus clerical staff.

India IEG Delhi Demographic Survey. Field canvasses of a probability sample of households in urban areas of the Delhi territory is being done to measure the fertility level and differential fertility. It also includes a KAP survey of contraceptive practices.
Duration: July 1968 - December 1969.
Staff: 12 persons.

Kenya UEA Survey of Family Planning Knowledge, Attitudes and Practice among Urban African Families in Kenya. The survey will include:
(a) determination of attitudes on the population question, opinions on ideal age at marriage, polygamy, use of available family planning facilities, etc.;
(b) collection of information on the need and costs of providing maternal care and contraceptive services to pregnant and puerperal women.

Duration: August 1969 - December 1970.
Staff: 4 full-time clerical staff and 44 part-time field assistants.

Kenya UEA KAP Study of African Residents in Nairobi. Family planning knowledge, attitudes and practice among African families is correlated to socio-economic status and modernity.
Duration: January 1969 - December 1969.
Staff: 12 interviewers, 2 coders, one part-time professional investigator.

Nigeria	DCH	Lagos Family Health Project. Demographic, social and maternal and child health characteristics, including attitudes toward and utilisation of family planning clinics are analysed from surveys conducted in the Lagos Metropolitan area. The project is broken up into three parts. The first part includes three rounds of a demographic and social survey, a KAP survey and various surveys on attitudes of the urban population toward medical care. The second part is a controlled motivation-referral programme to family planning clinics via house-to-house visits in the urban area, and the third part will be an IUD retention survey in the urban area. Duration: Part one has been completed, part two is now in progress, and part three is planned for late 1969. Staff: 45 persons.
Nigeria	DTR	KAP Anti-Natal Survey. The extent to which distance from the coast, degree of urbanisation and change to cash farming has determined family planning knowledge, attitude and practice. Duration: March 1969 - March 1970. Staff: 44 part-time and 5 full-time.
Philippines	PIUP	National Demographic Survey. This multi-purpose survey includes information on: (1) labour force size, (2) mobility (both spatial and social), (3) fertility level and change, and (4) family planning knowledge, attitudes and practice of a random sample of married women, 15 years and older, in Filipino households. Duration: 1968 and ending June 1970. Staff: 3-6 persons.
Republic of Togo	DU	KAP Sample Survey of the Republic of Togo. Attitudes towards family planning and contraceptive practices. Duration: Expected to be finished by 1970. Staff: 3 part-time researchers and 247 part-time interviewers.

Senegal

KAP Survey of Family Planning Possibility.

Duration: End December 1969.

Staff: One researcher.

Sierra Leone FBC

The Population of Sierra Leone: KAP/Demographic Survey. Conventional KAP Survey with regard to family size and family planning. The survey will also serve the purpose from which approximate fertility-mortality measures may be derived. The survey sample will cover 5,000 women aged 15-49 to gain the above information. The results will be analysed and broken down according to various sociological variables, e.g. urban/rural, tribe, religion, occupation, etc.

Duration: The termination date is estimated to be May 1970.

Staff: Approximately 10 people.

Tanzania UCT

Demographic Survey Project. The project is designed to collect basic demographic data in selected areas of Tanzania. The total population covered by the survey is approximately 60,000. Data from the 1968 survey census provides further information on birth, death and fertility rates, as well as migration.

Duration: 1967-1969, possible extension to 1970.

Staff: 7 full-time persons, 1 part-time research assistant and 1 part-time field supervisor.

Tunisia DDS

National Demographic Research. The objectives of this study are to collect data which will permit construction of a national table of mortality by age groups, to obtain more precise data about the birth rate, to permit calculation of the fertility rate (including analysis of the relationship between fertility and several socio-economic variables), to calculate the rate of increase of the population, to estimate the 1968 population of Tunisia, and to determine the extent of under-registration of births and deaths in order to assist in the improvement of vital registration.

Using the 1966 census list of households, a national stratified sample of approximately 25,000 households will be drawn. Interviews will be conducted in these households in two cycles with a six-month interval to determine the composition of the households in the sample at the beginning of the survey and the change which takes place in the elapsed period of time.

Duration: Two years, commencement date unknown.

Zambia DU Survey of Fertility and Population Growth in Selected Urban and Rural Areas of Zambia. The survey will include:

(a) Household information, e.g. age, sex, education, occupation, income, etc.;
(b) Marriage - types, number of times married, reasons for marriage break-up, ideal age of marriage;
(c) Fertility - children ever born, children born to mothers in the last 12 months, dead and living children;
(d) Contraceptives - use and knowledge of contraceptives, and a concensus of the public's support for their dissemination.

Survey will be coded and punched on IBM cards for subsequent analysis on the computer.

Duration: Final result in 1970.

Staff: 2 persons.

H. CONTRACEPTIVES: NON-BIOLOGICAL ASPECTS

India BES Study of the Demographic Particulars of Sterilised Persons in Kerala from 1957-1968. The characteristics of sterilised persons will be studied with respect to age, education, income, religion, number of living children, etc. Also investigated is the change in these characteristics over the years and their significance in reducing the birth rate.

Duration: Six months, commencement in 1969.

Staff: One researcher.

India DRCB Follow-up Survey of Sterilised Spouses. Estimation of the number of births averted due to sterilisation. Also study of the after effects of a sterilisation operation, if any, with regard to:

(a) physical and psychological aspects,
(b) sexual behaviour, and
(c) the differences of attitude of sterilised spouses towards sterilisation.

Duration: Started in June 1968 and is still in process of analysis.

Staff: Staff of the Demographic Research Centre.

India GIPE

To Study the IUD Programme in City and Non-City Areas. The study investigates the possibilities of popularising the IUD and conducting mass programmes in the field. It will be based on data collected in city and non-city areas covering 1,200 and 3,300 IUD cases respectively from interviews conducted from two to four years after IUD insertion.

Duration: 1967-1969.

Staff: Two researchers for half a year plus clerical staff.

Pakistan PARD

Socio-Economic Characteristics, Conditions and Reactions of Vasectomised Persons.
Duration: March 1968 - April 1969.
Staff: One full-time person.

Pakistan PARD

IUD Self Removal Study. Investigation of factors influencing removal of the IUD by the women themselves.
Duration: November 1968 - June 1969.
Staff: One full-time person.

Taiwan TPIFP

A Pill Comparative Study on Ovulen, Primovlar and Ovulen-Fe-28 in Taiwan.
The study is based on the investigation of the following factors in the use of the different pills available in the programme:

- knowledge about using the pill,
- how and why the pill was chosen,
- source of information about acquiring the pill,
- pregnancy history before and after pill administration,
- side effects.

Duration: July 1968 - June 30th, 1970.

Staff: One senior assistant and one junior assistant, 26 interviewers, 8 public health nurses and 4 coders.

Taiwan

TPIFP

Taichung IUD Medical Follow-up Studies. The aim of the study is to monitor possible side-effects of the then relatively new IUD and to provide a basis for biomedical studies over a period of time. It assesses the demographic correlates of IUD retention and the demographic and family planning histories of couples who entered the IUD programme.
Duration: This study is now in its continuing phase.
Staff: 60 full-time persons.

3. QUESTIONNAIRE ON CURRENT AND PROPOSED RESEARCH

We are interested in knowing about the research your institution is currently doing or has proposed to do in the areas of:

a) The relationships between population and social and economic development.
b) Fertility (data collection, evaluation, determinants of, correlates with, etc.)
c) Mortality (data collection, evaluation, determinants of, correlates with, etc.)
d) Migration and urbanisation.
e) Family planning.

Please describe these research activities in the following terms:

1) Give a descriptive name for the project.

2) What is the question being investigated?

3) Describe the method of analysis which is being utilised.

4) What is the time schedule for beginning and completion of this project?

5) How many full time people are or will be working on this piece of research?

6) What other institutions in your country are doing similar research?

INSTITUTE INDEX

(in alphabetical order of abbreviation and initials)

ANU	Australia	Department of Demography Australian National University Box 4C Canberra, ACT Australia
BES	India	Demographic Research Center Bureau of Economics and Statistics Kerala, Trivandrum India
CEDE	Colombia	University of the Andes Centro de Estudios Sobre Desarrollo Economico Calle 18-A Carrera 1-E Apartado Postal 4976 Bogota, Colombia
CEED	Mexico	Centro de Estudios Económicos y Demográficos El Colegio de Mexico Guanajuato 125 Mexico 7, D.F.
CELADE	Chile	Centro Latinoamericano de Demografia (CELADE) Jose Manuel Infante 9- Casilla 91 - Fonos 495071/4 Santiago, Chile
CEPAS	Congo	CEPAS P.P. 3096 Kinshasa Democratic Republic of the Congo
	United States	Community and Family Study Center University of Chicago 1126 East 59th Street Chicago, Illinois 60637 USA
	United States	Carolina Population Center University of Carolina University Square Chapel Hill, North Carolina 27514 USA
CSB	Tanzania	Central Statistical Bureau P.O. Box 796 Dar es Salaam, Tanzania
CU	Thailand	Chulalongkorn University Bangkok, Thailand

DCH	Nigeria	Department of Community Health University of Lagos College of Medicine PMB 12003 Lagos, Nigeria
DDS	Tunisia	Department of Demographic Statistics Tunis, Tunisia
DRC	India	Demographic Research Center Department of Statistics Patna University Patna, India
DRCB	India	Demographic Research Center Faculty of Science University of Boroda Lokmany Tilak Road Boroda, India
DTR	Nigeria	Demographic Training and Research Unit and the Department of Sociology and Demography University of Ife Ile-Ife, Nigeria
DU	Ghana	Demographic Unit Department of Sociology University of Ghana P.O. Box 96 Legon, Ghana
ECA	Africa	Economic Commission for Africa Demography and Social Statistics Section United Nations P.O. Box 3001 Addis Ababa, Ethiopia
ECAFE	Asia	Economic Commission for Asia and the Far East United Nations Sala Santitham Bangkok 2, Thailand
FAO	Italy	Food and Agriculture Organisation United Nations Via delle Terme di Caracalla Rome, Italy
FBC	Sierra Leone	Fourah Bay College University of Sierra Leone Freetown, Sierra Leone
	United States	Food Research Institute Stanford University Stanford, California 94305 USA

GIPE	India	Gokhale Institute of Politics and Economics Poona, India
	United States	Harvard Center for Population Studies Harvard University 9 Bow Street Cambridge, Massachusetts 02138 USA
	United States	Harvard University School of Public Health Cambridge, Massachusetts 02138 USA
IDE	Japan	Institute of Developing Economics 42, Ichigaya-Hommura-Cho Shinjuku-Ku Tokyo 162, Japan
	United States	International Demographic Statistical Center United States Census Washington D.C. USA
IEG	India	Institute of Economic Growth University of Delhi University Enclave Delhi, India
IFO	Germany	IFO Institute of Economic Research Centre of African Studies Pochingerstrasse 5 8 Munich 27 Germany
IFW	Germany	Kiel University Institut für Weltwirtschaft Dusternbrooker Weg 120/22 23 Kiel, Germany
IIEP	France	International Institute for Educational Planning 7 rue Eugène-Delacroix Paris 16, France
ILPES	Chile	United Nations Latin American Institute for Economic and Social Planning (ILPES) Calle José Manuel Infante 9 Cassilla 1567 Santiago, Chile
INED	France	Institut National d'Etudes Demographiques 23 avenue Franklin D. Roosevelt Paris 8, France

INTSH		les Sciences Humaines Pour INTSH B.P. 503 Fort Lamy, Chad
IPS	Senegal	Institut de Pediatrie Sociale Faculté Mixte de Medicine et de Pharmacie Dakar, Republic of Senegal
	United States	The International Population and Urban Research Institute University of California 2234 Piedmont Avenue Berkeley, California USA
ISSER	Ghana	Institute of Statistical, Social and Economic Research University of Ghana P.O. Gox 74 Legon, Ghana
ITT	Argentina	Instituto Tocuato de Tella Centro de Investigaciones Sociales Virrey del Pino 3230 Buenos Aires, Argentina
	United States	John Hopkins University School of Hygiene and Public Health Division of Population Dynamics 615 North Wolfe Street Baltimore, Maryland 21205 USA
MHW	Japan	Institute of Population Studies Ministry of Health and Welfare 2-2, 1-Chome, Kasumigas Chiyoda-Ku Tokyo, Japan
OECD	France	Development Centre Organisation for Economic Co-operati and Development 94 rue Chardon Lagache Paris 16, France
ORG	India	Office of Registrar General New Delhi, India
ORSTOM	Senegal	Office de la Recherche Scientifique et Technique Outre-Mer Centre ORSTOM De Hann-Dakar Republic of Senegal

INTSH	Chad	Institut National Tchadien Pour les Sciences Humaines INTSH B.P. 503 Fort Lamy, Chad
IPS	Senegal	Institut de Pediatrie Sociale Faculté Mixte de Medicine et de Pharmacie Dakar, Republic of Senegal
	United States	The International Population and Urban Research Institute University of California 2234 Piedmont Avenue Berkeley, California USA
ISSER	Ghana	Institute of Statistical, Social and Economic Research University of Ghana P.O. Gox 74 Legon, Ghana
ITT	Argentina	Instituto Tocuato de Tella Centro de Investigaciones Sociales Virrey del Pino 3230 Buenos Aires, Argentina
	United States	John Hopkins University School of Hygiene and Public Health Division of Population Dynamics 615 North Wolfe Street Baltimore, Maryland 21205 USA
MHW	Japan	Institute of Population Studies Ministry of Health and Welfare 2-2, 1-Chome, Kasumigas Chiyoda-Ku Tokyo, Japan
OECD	France	Development Centre Organisation for Economic Co-operation and Development 94 rue Chardon Lagache Paris 16, France
ORG	India	Office of Registrar General New Delhi, India
ORSTOM	Senegal	Office de la Recherche Scientifique et Technique Outre-Mer Centre ORSTOM De Hann-Dakar Republic of Senegal

PARD	Pakistan	Pakistan Academy for Rural Development Kotbari Comilla, East Pakistan
	United States	Population Council 245 Park Avenue New York, New York 10017 USA
	United States	The Pathfinder Fund 850 Boylston Street Chestnut Hill, Massachusetts 02167 USA
PI/HFRP	Tunisia	Pasteur Institute and The Harvard Florence Research Project Tunis, Tunisia
PIUP	Philippines	Population Institute University of the Philippines P.O. Box 579 Manila, Philippines
	United States	Philippine Population Study Group Department of Economics Humboldt State College Arcata, California 95521 USA
	United States	Population Studies Center University of Michigan 1225 South University Avenue Ann Arbor, Michigan 48704 USA
		Population Studies Center University of Pennsylvania Philadelphia, Pennsylvania 19104 USA
	United States	Pennsylvania State University Department of Economics University Park, Pennsylvania 16802 USA
	United States	Princeton University Office of Population Research Princeton, New Jersey 08540 USA
	United States	RAND Corporation 1700 Main Street Santa Monica, California 90406 USA
RCDTR	U.A.R.	Regional Centre for Demographic Training and Research Cairo, Egypt United Arab Republic

TPIFP	China	Taiwan Provincial Institute of Family Planning Health Agencies Union Building 103 Min Chuan Road, Taichung Taiwan, China
	China	Taiwan's Population Studies Center P.O. Box 112 Taichung Taiwan, China
	United States	University of California Department of Demography Berkeley, California USA
UCT	Tanzania	The University College P.O. Box 35019 Dar es Salaam, Tanzania
UEA	Kenya	University of East Africa University College Nairobi Department of Sociology Box 30197 Nairobi, Kenya
ULI	India	University of Lucknow Department of Economics Lucknow, India
UNESCO	France	United Nations Educational, Scientific and Cultural Organisation 9 place Fontenoy Paris 7, France
	United States	United Nations Population Division United Nations Building Room 3172 New York, USA
UNSA	Switzerland	United Nations Division of Social Affairs Palais de Nations 1211 Geneva 10 Switzerland

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