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PREFACE

The purpose of the *Population Bulletin of the United Nations*, as stipulated by the Population Commission, is to publish population studies carried out by the United Nations, its specialized agencies and other organizations with a view to promoting scientific understanding of population questions. The studies are expected to provide a global perspective of demographic issues and to weigh the direct and indirect implications of population policy. The *Bulletin* is intended to be useful to Governments, international organizations, research and training institutions and other bodies that deal with questions relating to population and development.

The *Bulletin* is prepared by the Population Division of the Department of International Economic and Social Affairs of the United Nations Secretariat and published semi-annually in three languages—English, French and Spanish. Copies are distributed widely to users in all member countries of the United Nations.

Although the primary source of the material appearing in the *Bulletin* is the research carried out by the United Nations Secretariat, officials of governmental and non-governmental organizations and individual scholars are occasionally invited to contribute articles.

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Explanatory notes

Symbols of United Nations documents are composed of capital letters combined with figures. Mention of such a symbol indicates a reference to a United Nations document.

Reference to "dollars" ($) indicates United States dollars, unless otherwise stated.

The term "billion" signifies a thousand million.

Annual rates of growth or change refer to annual compound rates, unless otherwise stated.

A hyphen between years (e.g., 1984-1985) indicates the full period involved, including the beginning and end years; a slash (e.g., 1984/85) indicates a financial year, school year or crop year.

A point (.) is used to indicate decimals.

The following symbols have been used in the tables:

Two dots (. .) indicate that data are not available or are not separately reported.

A dash (—) indicates that the amount is nil or negligible.

A hyphen (-) indicates that the item is not applicable.

A minus sign (-) before a number indicates a deficit or decrease, except as indicated.

Details and percentages in tables do not necessarily add to totals because of rounding.

Population Bulletin of the United Nations, No. 29—1990

THE DEMOGRAPHIC RESPONSE TO ECONOMIC CRISIS IN HISTORICAL AND CONTEMPORARY POPULATIONS*

Ronald Lee**

SUMMARY

In contemporary industrialized countries patterns of demographic response to economic fluctuations are obscure and continue to generate controversy. However, in the many historical and third world populations that have been studied, there are surprisingly many shared patterns of demographic response. They permit the following generalizations:

(*a*) The demographic effects of an economic fluctuation are spread out over a number of years;

(*b*) Fertility, mortality, nuptiality and migration all respond to economic fluctuations, although fertility and mortality are most frequently studied;

(*c*) It is a common mistake to attribute short-run fertility fluctuations to fluctuations in marriages; they are mainly due to marital fertility;

(*d*) Increases in deaths and declines in births are both responsible for population loss in crises, but mortality has greater responsibility in poorer settings and fertility in richer settings;

(*e*) If the decline in fertility and births is not taken into account, the increase in mortality will be underestimated by crude death rates or numbers of deaths;

(*f*) The mortality increase following an economic crisis is not necessarily contemporaneous with the crisis and may be substantially delayed. It may be followed by a period of below-normal mortality;

(*g*) Fertility responds in a regular fluctuating pattern shaped by the biology of the interbirth interval;

(*h*) Migration plays an important role in the demographic response to economic crisis;

*This paper was prepared for the informal session on "The demographic response to economic crisis" organized by Jose Alberto Carvalho for the 1989 General Conference of the International Union for the Scientific Study of Population, held at Delhi, India, September 1989. The author is grateful to Patrick Galloway for his helpful comments on an earlier draft and for his research, which helped to reveal the patterns discussed in the paper. Ulla Larsen also provided helpful references and comments. The research on which this paper was based was funded by a grant from the National Institute for Child Health and Development.

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(*i*) Demographic response to economic crisis is seldom a quantitatively important influence on population trends;

(*j*) The demographic response—at least for mortality—may increase more than proportionately with the size of the crisis;

(*k*) Responses occur even for small price variations, and even for food price *reductions*.

Introduction

In the past decade, many developing economies have experienced severe fluctuations. What have been the demographic consequences? Rather than address the question directly, I shall place it in perspective by discussing the influence of economic fluctuations on vital rates in earlier periods, in both developed and developing countries. A sufficient number of studies have been done, using a common methodology, to permit a comparative analysis, and we shall see that there are many shared patterns of demographic response. The patterns discussed here are rather abstract and statistical and can be observed in the simplest data—time series of vital events and food prices. Richer historical and anthropological sources (e.g., Caldwell and Caldwell, 1987) yield additional fascinating detail but are beyond the scope of this brief review.

There are, of course, many important differences between short-run fluctuations in the past and in the modern world. Infectious disease has been greatly reduced in importance by improved living conditions and preventive measures. Contraception is vastly improved. Transportation and communications have developed to the point where harvest failures are more effectively offset by the market, and the international community can intervene in a more effective and timely manner. The role of agriculture in national economies has decreased, and crises arising from international trade and finance, rather than from poor weather, have grown in relative importance. There has surely been a general increase in the proportion of the total labour force which is landless and primarily engaged in wage labour, at least when the non-agricultural sector is included in the accounting; for such workers, high food prices are an undiluted misfortune. In practice, third world countries fall on a continuum ranging from those for which the pre-industrial European setting may be relevant to those for which the experience of contemporary developed countries may be more germane.

This paper is concerned explicitly with the effects of economic crisis on demographic variables, and so it is specifically about short-run fluctuations. More generally, however, we study short-run fluctuations to try to learn something about broader issues concerning fertility and mortality. For this purpose, the study of short-run fluctuations has the advantage of requiring very little data and being highly resistant to problems of poor data, underregistration, lack of reliable denominators for rates and so on.

It has a considerable disadvantage in that the behavioural response to short-run economic shocks may be entirely different from that to long-run changes. Thus, it may be misleading to generalize from the study of short-run fluctuations.

THEORY

There are many kinds of economic crisis. Most typically, perhaps, in the economies and populations to be discussed below, a crisis originates in a weather-induced harvest failure, in which there is simultaneously a reduction in agricultural output and an increase in agricultural prices. For landless labourers, this is an unmitigated disaster. Large land-owners may be net beneficiaries, depending on the price elasticity of demand for food and the degree of closure of the local food market. Smallholders occupy an intermediate position. Non-agricultural labourers may be doubly hurt, because rural demand for their products may decline at the same time as food prices rise. Sen (1981) and Ravallion (1987) have argued that sharp rises in food prices may sometimes occur despite normal harvests, arising from the inaccurate expectations of grain speculators. Such crises should have slightly different effects. Certainly the importance of food-price variations will decline directly with the share of food in the household budget, which varies inversely with per capita income. Other crises may originate from the industrial sector or from the international economy; the current crisis in Latin America is of this sort. Finally, political and military events may cause crises, sometimes in combination with other causes, as in China's Great Leap Forward or in Ethiopia.

If capital markets were perfect, then households would borrow or not save when real income was temporarily low. The demographic response to economic crisis would then be muted, but probably still present. It would remain, in part, because it would still be rational to consume less food, for example, when food prices are unusually high, and changed nutrition might then affect demographic outcomes. Furthermore, involuntary unemployment and altered incentives to work would alter time use and its costs. Thus Butz and Ward (1979) have argued that women with a labour-force attachment would seek to time their births during periods of economic slack. The crisis may also lead to displacement of family members in search of work in distant places, which, on the one hand, may spread disease and affect their mortality risks, and on the other hand, may lead to periods of sustained abstinence from coitus.

In reality, of course, capital markets are far from perfect. Labourers with patrons may be able to go into debt. More typically, those with assets in the form of land, livestock or jewelery will sell them to raise money. Other household expenditures will be reduced to buy food, and there will be a shift within food expenditures to cheaper sources of energy (which will not necessarily be less nutritious; see Behrman and Deolalikar, 1988). Nonetheless, nutrition will likely suffer, housing may be more crowded, sanitary conditions and health care may slip, and there may be greater

exposure to pathogens. Because of these changes, morbidity and mortality will likely rise, although that is less likely to happen when food takes a smaller share of the normal budget; when the diet initially includes more costly items, such as meat, which can be reduced; and when the exposure to infectious disease is lower, due to public health measures.

Births are likely to be voluntarily postponed in such times because they require additional caloric intake by the mother and because they interfere with her ability to devote time to coping in whatever way with the crisis—foraging, seeking work, taking on extra agricultural tasks while the husband temporarily migrates, and so on. Additionally, reduced nutrition, if severe, may reduce fecundity, spousal separation may reduce sex, psychic stress may lead to amenorrhea or reduce coitus and marriages may be postponed. If the crisis leads to greater morbidity, this will also lead to lower fertility for various reasons. All of these changes would tend to reduce births.

Certainly not all people will be affected in the same way by a crisis. Some will be more isolated from major markets for buying imported food or selling off personal assets. Large landholders may be net agricultural producers, and may actually benefit from a harvest failure, if the price elasticity of demand for food is sufficiently low. Poor landless labourers will be the hardest hit by a crop failure, but will be less affected, perhaps, by an economic crisis of international origins.

Methods

The basic method and its rationale are set out in Lee (1981); most of the studies to be reviewed here adopt a similar approach, often with some refinements. Some researchers propose a different approach (Schultz, 1986; Bengtsson and Brostrom, 1986); I continue to prefer the one described below. The necessary data for the most basic study include annual time series of births, deaths and grain prices. The series should be at least 30 years long, although a successful study can sometimes be made using as little as 10 years of data when the purpose is to investigate a specific major crisis. If crude rates or more refined measures of fertility and mortality are available, so much the better, but they are not needed, since the population size and age distribution change rather slowly relative to the fluctuations we wish to study . The exception is that during a crisis, births fall, which in itself would cause a decline in deaths. If this compositional effect is not taken into account, the rise in mortality will be underestimated.[1] These data series should generally be detrended either by first-differencing all series (or their logarithms) or by dividing by a moving average (a 9- or 11-year moving average is often used for this purpose).

Because the repercussions of an economic shock take a number of years to work their way through the demographic system, as is discussed below, it is essential to allow for effects spread over time. The failure to do so is the major failing of the dozens of older studies. This is conveniently done by using a distributed lag model, in which lags of up to

four years are included. Thus deaths are regressed on contemporary grain prices, and prices lagged one year, two years, three years and four years (for shorter data series, only lags of up to two years can be used). The total effect of a price variation is found by summing all these distributed lag coefficients. If the data were first logged or divided by a moving average, then the coefficients and their sum are elasticities, indicating the ratio of a proportional change in mortality to a proportional change in prices. Thus, a sum of +.25 would mean that a 10 per cent increase in prices for one year would eventually lead to an excess number of deaths equal to .025 (=.25 × .10) times the normal annual number of deaths. Standard methods may be used to adjust for serially correlated residuals.

A similar analysis can be performed for births, but two comments are in order. First, it is very important *not* to include current and lagged marriages as explanatory variables. Estimates will always show them to have a strong effect, but this is almost always spurious (see Lee, 1975 and 1981). The same events that lead to lower marital fertility also lead people to postpone marriage. To assess the genuine causal effects of marriage on births, one must use an average schedule for the distribution of births by duration of marriage, applied to the actual time series of marriages, to calculate expected fluctuations in the number of births if the duration schedule were to remain constant. Secondly, in pre-industrial populations, there is always a very strong negative covariation of mortality and fertility. As with marriages, this covariation does not reflect causality in either direction.[2] Unlike the case of marriages, however, it is readily interpretable and interesting: it reflects the common influence of morbidity on both fecundity and mortality. When the death rate is high, morbidity must be far higher, and it affects fecundity in a number of ways, ranging from foetal loss to reduction in coital frequency. The influence of these variations in unobserved morbidity can be controlled by including lagged adjusted deaths as right-hand variables. Any interpretation of the estimated coefficients as indicating an "effect" of mortality on fertility must be rigourously avoided, however; the covariation arises from correlated disturbances in the two equations, due to the omitted variable, morbidity.

DATA AND EMPIRICAL FINDINGS

Pre-industrial Europe

I will begin by reviewing the findings of studies of pre-industrial European populations. Results have been remarkably consistent across populations and time periods, despite some variations in method. This is most strikingly evident in the work of Galloway (1988, 1989), who has analysed dozens of data sets in a comparative setting.

Almost always, marital fertility is negatively related to grain prices, with cumulative elasticities in the range −.05 to −.3. Mortality is positively related to prices, with cumulative elasticities in the range +.05 to +.6. Nuptiality is negatively related to prices, with cumulative elasticities in the range 0 to −.3. Galloway (1988) has shown that elasticities, partic-

ularly for mortality, are generally higher in absolute value in poorer, more agricultural settings.

Similarity in the timing of the response to an economic crisis is particularly striking. Strangely, mortality often remains high for two years following the crisis, then drops to below its normal level for a time, because there are fewer old and weak than usual. Fertility is lowest in the year following the crisis, then rebounds to above-normal levels before returning to normal. This has a clear biometric interpretation, discussed below. Nuptiality behaves more erratically. Typical shapes of distributed lag responses for Europe are shown in figures I and II. They will be discussed later.

Third world countries

The studies reviewed above for Europe are not studies of crises or famines *per se*; rather they are studies of the demographic response to whatever food-price variations are recorded in the data—large and small, upwards and downwards. Occasionally the effects of major price shocks are studied separately, but this is unusual (see Lee, 1981, and Galloway, 1987, for example). For the third world, studies of the usual kind done for Europe are available, but there are also studies specifically of the recent major famines in Bangladesh and China, which I will review first.

In Bangladesh, in 1974–1975, rice prices rose briefly to two and half times their normal level, causing severe famine conditions. Langsten (1980) estimated a monthly distributed lag model similar to mine, on data from Matlab in Bangladesh, from 1966 to 1976. Despite the shortness of the series, his results are quite similar to mine for England. The cumulated elasticity of the crude death rate with respect to rice prices is $+.288$ and for the crude birth rate is $-.277$ (versus $+.234$ and $-.144$ for England); these are both taken over 18-month lags. It is also interesting that Langsten found far stronger results using prices than using agricultural production. This is not surprising, since Sen (1981) has shown that food production was slightly higher than normal during that famine. This provides encouraging support for the common practice of analysing price data rather than quantity data.[3]

The shapes of the lag patterns Langsten found are also similar to those in Europe: fertility has a trough from eight to 14 months after a price shock, and then experiences a rebound. Mortality shows its main effect four to eight months after a price shock, and then by ten months after the shock there is a slight compensating rebound.

During the Great Leap Forward, China experienced a severe decline in grain production, causing a reduction by about 25 per cent in food energy available per capita (see Ashton and others, 1984), and a number of demographers have documented the enormous loss of life (30 million excess deaths) and a decline in fertility by nearly 50 per cent (see Ashton and others, 1984). Unfortunately, the time series available to me for analysis were very short, covering only the 12 years from 1953 to 1964. I

took my basic data from Ashton and others; doubtless at least 20 years could be added to that series, but its variance would be dominated by the single great fluctuation. The brevity of the series makes all estimated patterns quite unreliable. Grain-price data were not available, so quantity measures were used. Consequently, it is difficult to compare the estimated elasticities to those for other countries and periods. However, the price elasticity of demand for food is probably close to -1 for impoverished populations; therefore, simply changing the sign on the quantity elasticities for China should render them roughly comparable. My estimates, based on data in Ashton and others (1984), give a cumulated elasticity for fertility of $+.33$, with a lag pattern similar to the standard. For mortality, the sum is very near 0 (over lags of 0, 1 and 2 years), which is surely a distortion of reality. However, the estimates do show very strong timing effects consistent with the general European pattern and with Bangladesh. Mortality rises sharply in the first year of a shortage, is still high one year later, and then declines below normal after two years.

These studies of crises in Bangladesh and China focus on brief episodes known to be associated with major food-production shortfalls or price increases. With Patrick Galloway (see Galloway and Lee, 1985) I also studied some longer time series from India, Japan and the Province of Taiwan, China, in which estimated response patterns reflect price fluctuations of all magnitudes and the vital rates are also buffeted by other forces; these results represent more typical situations, and should be more comparable to those for pre-industrial Europe. In addition, there have been studies of an earlier period in Japan (Feeney and Hamano, 1988) and historical Mexico (Reher, 1989). The table below presents cumulated elasticities for those seven third-world populations, as well as summary data for Europe. It will be seen that there is considerable variation, but that all but two of the 14 developing countries' numbers have the expected sign. The medians are close to $-.3$ for fertility and $+.3$ for mortality; thus, a 10 per cent rise in prices would engender a total change in births or deaths equal to about 3 per cent of their typical annual number. Based on Galloway's (1988) results for European populations, the higher cumulated mortality elasticities would be expected for populations with per capita incomes in the range of United States \$200-\$300 (1970) and are not as high as those found for Tuscany or Austria in the nineteenth century. The responses of fertility in Europe are never found to be over 0.2 in absolute value, so their far higher values in a number of developing countries represent a challenging departure from previous experience.

All these analyses reveal timing patterns that are consistent with the standard pattern. The lag sums are generally, but not always, consistent as well. The timing patterns associated with the cumulated effects are displayed in figures I and II. Figure I shows median values of the mortality response by years since the price variation. It should be understood that there is a great deal of variation in the mortality patterns for individual populations, in contrast to the great similarity observed for fertility. None the less, there is useful information in these median patterns. For Europe,

TABLE. ESTIMATED CUMULATIVE ELASTICITIES OF DEMOGRAPHIC RESPONSE TO ECONOMIC CRISIS FOR SELECTED THIRD WORLD POPULATIONS OVER THE PAST CENTURY

Population	*Date*	*Fertility lag (sum)*	*Mortality lag (sum)*
Bombay	1883-1925	−.292	+.119
Taiwan (Province of China)	1914-1938	−.073	−.296
Japan	1882-1940	+.044	+.286
Japan	1807-1886	−.163	-
Bangladesh	1966-1976	−.277	+.288
China	1953-1964	−.330	0
Mexico	1750-1810	−.460	+.588
Europe	1540-1870	−.136	+.160

Sources: For Bombay, Taiwan (Province of China) and Japan, 1882-1940: Patrick Galloway and Ronald Lee, "Some possibilities for the analysis of aggregate historical demographic data from China", a paper presented at the Workshop on Qing Population History, Pasadena, California, 26-30 August 1985. For Japan, 1807-1886: Griffith Feeney and Kiyoshi Hamano, "Rice price fluctuations and population change in late Tokugawa Japan", a working draft (Honolulu, East-West Population Institute, 1988). The number shown is the average of their results for 13 different prefectures. For Bangladesh: Raymond Lewis Langsten, "Causes of changes in vital rates: the case of Bangladesh", unpublished dissertation (Ann Arbor, University of Michigan). For China: author's estimate (see text). For Mexico: the number shown is the median for estimates for seven populations, based on David Sven Reher, "Population and economy in eighteenth century Mexico: an analysis of short-term fluctuations", a paper prepared for the IUSSP Conference on the Population History of Latin America, Ouro Preto, Brazil, 2-6 July 1989. For Europe: these are averages of Galloway's 1988 estimates for 14 European populations for varying time periods starting from 1540, but mainly in the period 1750-1870.

note that high mortality continues for two years past the year in which the price variation occurs. This suggests that famine weakens some people who never regain their strength, and later die from causes other than starvation. This pattern was found in England, a relatively rich country, and in Tuscany and Austria, relatively poor. The Caldwells (1987) report a similar phenomenon following an African famine.

In the median European pattern, there is very little rebound of mortality, yet many countries show a strong tendency for mortality to fall *below* its normal levels some time after the initial increase. The median developing countries data show a rather different pattern. Following a price increase, the mortality response is not only larger but it is also concentrated in the initial year, after which mortality drops below normal. This median pattern also shows very strongly in the estimates for Mexico and Bombay. I speculate that really severe crises kill outright and leave fewer weakened survivors.

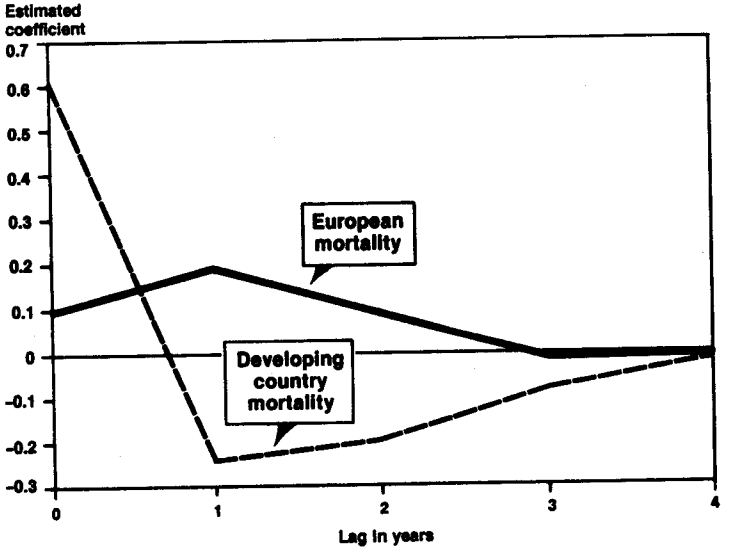
Turning now to figure II, showing the response of fertility to a food-price variation, we find very similar patterns among European populations and those of the third world. This similarity is even more apparent in figure III, in which the coefficients have been divided by their cumulated values to standardize the strength of response, allowing the timing pattern to emerge more clearly.[4] In the year of a price variation there is little response, because of the nine-month gestation period, and a normal wait-

ing period of a few months before a planned conception occurs; there would also be a delay before reduced food intake leads to a change in nutritional or health status. A year later the brunt of the fertility reduction occurs, whether due to conscious control or to socio-biological response. In the following year (at lag 2) fewer women than usual are removed from risk of conception by pregnancy or lactational amenorrhea, so more than usual conceive, leading to *more* births than usual. The next two years see a continuation of this oscillating pattern. The basic pattern is exactly what one would expect from biometric models such as those developed in Henry (1972) or Sheps and Menken (1973). Occasionally the major response occurs at lag 0, which might reflect greater reliance on abortion.

Modern developed country populations

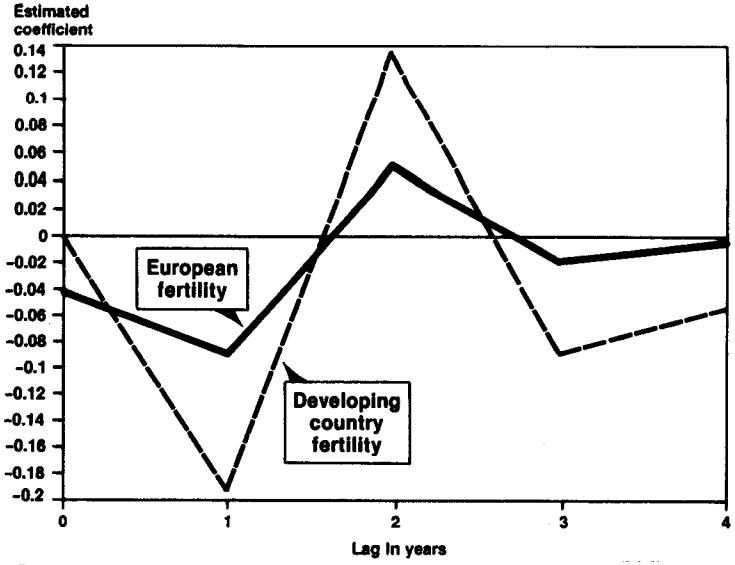
Demographic response patterns for developed countries are potentially relevant for the more developed of the third world countries, but results

Figure I. The influence of food prices on mortality: estimated lagged effects for selected populations in Europe and the third world, for various periods from the sixteenth century to the present



Sources: The estimates for Europe are taken from Patrick Galloway, "Basic patterns in annual variations in fertility, nuptiality, mortality and prices in pre-industrial Europe", *Population Studies* (London), vol. 42, No. 2 (July 1988). They are medians of the estimates in his appendix table 1, for 14 European populations, mostly for 1750-1870, but some for earlier periods. The developing-country pattern is the median of estimates for Mexico from David Sven Reher, "Population and economy in eighteenth century Mexico: an analysis of short-term fluctuations", a paper prepared for the IUSSP Conference on the Population History of Latin America, Ouro Preto, Brazil, 2-6 July 1989; and for Bombay, Taiwan (Province of China) and Japan from Patrick Galloway and Ronald Lee, "Some possibilities for the analysis of aggregate historical demographic data from China", a paper presented at the Workshop on Qing Population History, Pasadena, California, 26-30 August 1985.

Figure II. The influence of food prices on fertility: estimated lagged effects for selected populations in Europe and the third world, for various periods from the sixteenth century to the present



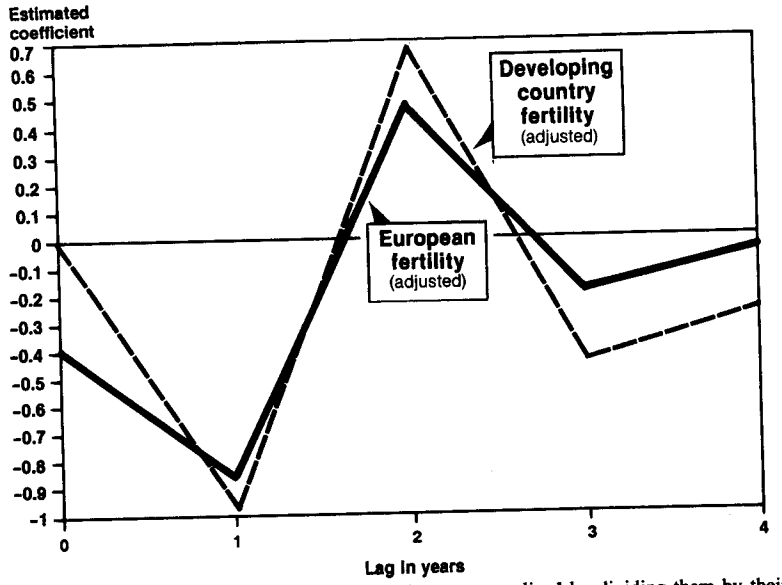
Sources: The estimates for Europe are taken from Patrick Galloway, "Basic patterns in annual variations in fertility, nuptiality, mortality and prices in pre-industrial Europe", *Population Studies* (London), vol. 42, No. 2 (July 1988). They are medians of the estimates in his appendix table 1 for 14 European populations, mostly for 1750-1870, but some for earlier periods. The developing country pattern is the median of estimates for Japan (two subperiods) from Patrick Galloway and Ronald Lee, "Some possibilities for the analysis of aggregate historical demographic data from China", a paper presented at the Workshop on Qing Population History, Pasadena, California, 26-30 August 1985, and from Griffith Feeney and Kiyoshi Hamano, "Rice price fluctuations and population change in late Tokugawa Japan", a working draft (Honolulu, East-West Population Institute, 1988); for Mexico: David Sven Reher, "Population and economy in eighteenth century Mexico: an analysis of short-term fluctuations", a paper prepared for the IUSSP Conference on the Population History of Latin America, Ouro Preto, Brazil, 2-6 July 1989; and for Taiwan (Province of China) and Bombay: Patrick Galloway and Ronald Lee, "Some possibilities for...", *loc. cit.*

for them are highly controversial, and no consensus exists even as to the signs of the responses. Many older studies (Silver, 1965; Galbraith and Thomas, 1941; and Kirk, 1960, for example) concluded that fertility was pro-cyclical in developed countries during the first half of the twentieth century. But the more recent work of Butz and Ward (1979) has argued that as the participation of women in formal market employment increased, good economic times came to impose heavier child-bearing costs than poor economic times, so that fertility became counter-cyclical. Methodological problems make interpretation difficult, and call the empirical results into question,[5] but no one has shown that the pro-cyclical pattern has continued to hold since the 1950s.

On the side of mortality the controversy is equally strong. One influential writer believes there are strong adverse health consequences of recessions in the United States and calculates a number of deaths associ-

ated with each notch in the unemployment rate (Brenner, 1983). But this work has been heavily criticized (Stern, 1983, and Wagstaff, 1985).

Figure III. The adjusted influence of food prices on fertility: estimated lagged effects for selected populations in Europe and the third world, for various periods from the sixteenth century to the present



Sources: The estimates presented in figure II were normalized by dividing them by their sums for each set of populations, to remove the influence of differences in overall sensitivity of response. The estimates for Europe are taken from Patrick Galloway, "Basic patterns in annual variations in fertility, nuptiality, mortality and prices in pre-industrial Europe", *Population Studies* (London), vol. 42, No. 2 (July 1988). They are medians of the estimates in his appendix table 1 for 14 European populations, mostly for 1750-1870, but some for earlier periods. The developing country pattern is the median of estimates for Japan (two subperiods) from Patrick Galloway and Ronald Lee, "Some possibilities for the analysis of aggregate historical demographic data from China", a paper presented at the Workshop on Qing Population History, Pasadena, California, 26-30 August 1985, and from Griffith Feeney and Kiyoshi Hamano, "Rice price fluctuations and population change in late Tokugawa Japan", a working draft (Honolulu, East-West Population Institute, 1988); for Mexico: David Sven Reher, "Population and economy in eighteenth century Mexico: an analysis of short-term fluctuations", a paper prepared for the IUSSP Conference on the Population History of Latin America, Ouro Preto, Brazil, 2-6 July 1989; and for Taiwan (Province of China) and Bombay: Patrick Galloway and Ronald Lee, "Some possibilities for . . .", *loc. cit.*

Summary

I conclude that the experience of European populations before the twentieth century is highly consistent with the experience of the poorer third-world countries up to the present, or at least of those few that have so far been examined. However, for the wealthier third-world countries, patterns might be expected to conform more closely to those of the populations of the developed countries, and those patterns are entirely obscure and provide no reliable guidance.

There are a number of similarities shared by all pre-industrial periods and settings analysed.

(*a*) The effects of an economic fluctuation are spread out over time, and it is essential to use a statistical method which accommodates this lagged pattern of response. Most of the early studies used simple correlations, and so reported misleading results, often missing the patterns altogether;

(*b*) Fertility, mortality, nuptiality and migration all respond to economic fluctuations, although fertility and mortality are most frequently studied;

(*c*) It is a common mistake to attribute the fertility fluctuations to fluctuations in marriages. In fact, the fertility fluctuations result primarily from fluctuations in marital fertility, even in "natural fertility" populations (see Lee, 1975 and 1981). Nuptiality matters only for first births, which are typically not a large proportion of all births;

(*d*) Caldwell and Caldwell's (1987) generalization—that increases in deaths and declines in births are roughly equally responsible for population loss in crises—is correct for a certain range of per capita incomes, but mortality has greater responsibility in poorer settings and fertility in richer settings (see Galloway, 1988, p. 296);

(*e*) If the decline in fertility and births is not taken into account, the increase in mortality will be underestimated when crude death rates or numbers of deaths are used;

(*f*) A mortality crisis is often followed by a period of unusually low mortality, since deaths that were advanced in time by the crisis do not occur later; the timing of the compensating decline varies, but it occurs sooner when the crisis is more severe. The mortality increase associated with an economic crisis is not necessarily contemporaneous with the crisis; in the median European pattern, the response is distributed fairly evenly over the two years following the crisis as well as the crisis year itself;

(*g*) Fertility change follows a predictable pattern, shaped by the biology of the interbirth interval: a decrease in fertility is followed after a year or two by an increase, when an unusually large number of women are at risk of childbirth, since fewer than usual are pregnant or lactating. Oscillations of this sort have a period equal to the average length of the closed birth interval, and rapidly die out;

(*h*) Migration plays an important role in the demographic response to economic crisis. Temporary separation of husbands and wives reduces fertility, and migrants spread disease, which contributes to rising mortality;

(*i*) Demographic response to economic crisis is seldom a quantitatively important influence on population trends; even the massive Chinese famine of 1959–1961 represented loss of only a few years' natural increase (Caldwell and Caldwell, 1987; and Watkins and Menken, 1985);

(*j*) The demographic response—at least for mortality—may increase

more than proportionately with the size of the crisis. The response is often non-linear, and the more severe the crisis, the more immediate the response (see Lee, 1981, and Ravallion, 1987);

(*k*) Responses occur even for small price variations and even for food-price *reductions* (this has been examined only for England; see Lee, 1981).

As for more industrialized settings, recent research on the population of the United States has yielded highly contradictory results, and it is currently impossible to generalize. Yet it is the experience of the developed countries that should be more relevant for the more industrialized developing countries, particularly in so far as we are interested in the effects of non-agricultural economic crises. My guess is that in these countries economic crisis will be followed by a decline in fertility and perhaps marriages, but that there will be little or no discernible effect on mortality.

Demographic responses have been examined for only a very few contemporary third-world countries, and the data exist to expand the list for both richer and poorer populations. Furthermore, the models estimated here are very stripped down, and it would be preferable to include a wider range of variables, such as temperature, identifiable non-economic epidemics and political and military disturbances. With a larger collection of studies on a richer set of models, firmer generalization will be possible.

NOTES

[1] The simplest adjustment is to use an appropriate average infant mortality rate and separation factor and to subtract from the series of deaths the number of deaths of infants that would be expected each year, based on average rates and on the number of births in the current and preceding years.

[2] Careful consideration of the possible links shows that any true causal links are bound to be quite weak—for example, the death of pregnant women, the rupture of marriages or the lactation interruption effect (see Lee, 1977).

[3] Quantity data, indicating the size of the harvest, for example, have a number of difficulties, since they take no account of the possibilities of trade or of storage from earlier years by speculators, consumers or public institutions.

[4] Because the cumulated lag is a capricious measure, it would generally be better to standardize on the coefficient at lag 1, which is a more robust measure of strength of response.

[5] The original specification incorrectly used a multiplicative form for overall fertility in relation to that of women in and out of the labour force, when an additive specification was clearly called for. Furthermore, despite unsatisfactory Durbin Watson statistics, no effort was made to correct for auto-correlated disturbances. Efforts to replicate the results with a more statistically appropriate procedure have been unsuccessful. Also, the analysis did not distinguish between the response to short-run fluctuations and to longer-run movements. Finally, the lag patterns of response that were found are very suspicious.

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POPULATION PROJECTION AS PREDICTION, SIMULATION AND PROSPECTIVE ANALYSIS

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SUMMARY

After discussing the concept of predictability in projection, the paper addresses issues of practical importance to the producers of projections. Theoretical frameworks such as logistic growth, demographic transition and the probabilistic conceptualization of demographic events are considered in terms of their relevance to population forecasting. From a programme management point of view, a challenging question is raised as to how to enhance analytical capability so as to enable formulation of plausible assumptions about the future, while at the same time increasing the operational efficiency of the model in order to minimize costs. Other issues examined include the time horizon, the frequency and the advisability of single versus multiple projection scenarios.

The notion of predictability, so central to the conventional meaning given to projections, is de-emphasized, and that of analytical credibility stressed. While the uncertainty inherent in the future is recognized throughout, the significance of a credible analysis as a criterion for acceptance of a projection is heightened. The extent to which a projection contributes to decisions shaping the future is a sensible question to ask when appraising its usefulness. Hence, the emphasis is on projections as an instrument of "creating" rather than "discovering" the future.

INTRODUCTION

Population forecasting has a fairly long history. It can be traced back to the inception of demography as an academic and applied discipline, and beyond, to what was known as "political arithmetic" (Frejka, 1981). But in those days, the art of conjecture about future population originated from

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an inquisitive and speculative state of mind, rather than from the need to solve practical problems. As a utilitarian endeavour, forecasts or projections are of relatively recent making. It is only in the past two or three decades that they have evolved into a profession *sui generis*, and a business on a respectable scale. (For an overview of the growth of the social forecasting industry, see, among others, Smith, 1987.)

Population projections are now part and parcel of public administration and private business. The advent of electronic technology in data manipulation and the blossoming of statistical modelling have no doubt been factors in their growth. But a more pervasive inducement to engage in forecasting has to do with present-day bureaucracy—or technostructure, to use Galbraith's term—committed to a management practice which relies heavily on planning and quantitative evaluation of the anticipated impact of programmes and policies. This "anticipatory management" is very much part of our management culture. Even liberal, free-market States have greatly expanded their sphere of pro-active intervention into social and economic matters. The projection industry is bound to grow unabated, notwithstanding the frequently voiced criticism that projected figures are often off the mark and therefore of doubtful utility—a claim, I should hasten to add, that stands at variance with that of this paper.

Despite the many excellent essays on the taxonomy of forecasting in population and in social affairs generally (Jouvenel, 1962; Duncan, 1969; Henschel, 1976; Lachapelle, 1976; Ascher, 1978; Le Bras, 1987; etc.) there is—not surprisingly, given the elusiveness of the subject—a great deal of confusion about it. Semantics is a comparatively minor problem. The more trying one is of a conceptual and epistemological nature. This paper is about three ways of viewing projections—as prediction, simulation and prospective analysis—and the term "projection" is used here in a generic sense. Inasmuch as discussion of projection as prediction may appear speculative, that of projection as prospective analysis raises issues of very practical import to projection-makers. Some of those issues are inspired by my long-standing association with the demographic projection programme at Statistics Canada. I hope at the very least that this article will succeed in conveying a more "realistic" perception of the projection work in which we as demographers are involved.

As the discourse unfolds, it will indeed become apparent that the notion of *predictability*, so central to the "conventional" meaning given to projections, is de-emphasized, while that of *analytical credibility* is stressed. This means turning away from the far too elusive and, indeed, intractable goal implied by the former, to one implying improvability and acceptability by professional peers and users. We must rid ourselves of the "oracle complex" and take a down-to-earth view of what are, in real-life situations, the kinds of projections that government and private agencies engage in. It seems to me that a sensible question to ask is whether and how projections are used in decision-making processes, rather than how well they predict the future (something that can be verified only *ex post facto*). To put it differently, the emphasis is on projections as an instrument in "creating" rather than "discovering" the future.

Let us remind ourselves first that the art of population conjecture grew out of a deliberate effort to predict the evolution of populations. Indeed it was long believed that the evolution of human society was governed by laws similar to those found in the physical world and that it was incumbent upon scientists to discover them and put them to practical use, including prediction of the future. The following quotation from Condorcet, a major figure of the eighteenth-century Enlightenment, captures well the mood of the time:

> "If man is able to predict, with almost complete assurance, those phenomena whose laws he understands, . . . he can, using his experience of the past, predict the future with a high degree of probability; why then should it be thought fanciful to sketch with some degree of plausibility the destiny of the human race, based on its history?" (Translated from the 1988 French edition, p. 265.)

From our present-day vantage point, Condorcet may sound too optimistic, if not far-fetched. But the controversy between the proponents of social determinism and those of indeterminism is far from being settled (Gurvitch, 1963). Some believe that social events are part of a kind of pre-ordained, "law-like" process and are, as such, predictable. Others believe in the historical uniqueness and, hence, the inherent unpredictability of social events.

For the rationalization of demographic projection as prediction, one could turn to three different theoretical frameworks. The first implies the existence of a general law of population, and the second that of statistical regularities; the third one involves a probabilistic or stochastic conceptualization of demographic events.

In the way of a broad theoretical framework for forecasting population, two well-known demographic theories come to mind: logistic growth and demographic transition. Logistic growth theory describes an itinerary whereby, after initial growth difficulties, the population sets out on a course of rapid expansion. As higher levels of density are reached and growth is increasingly frustrated in a finite space, population expansion tapers off to an eventual halt. A mix of the Malthusian vision of exponential population growth and of the law of diminishing returns, logistic growth theory is reflective of the relatively simple relationship between population and the environment under the conditions prevailing in premodern, agrarian societies. Its appealing socio-biological (or ecological) rationalization (Quetelet, 1869) and mathematical formulation (Verhulst, 1844) made it an influential theory among social scientists of the second half of the nineteenth and first half of the twentieth centuries. It gave rise to many empirical statistical applications—curve fitting to observed trends in a variety of social fields, and forecasting. Some of the forecasting actually turned out to be fairly accurate.[1]

Since the Second World War, however, logistic growth theory has been largely upstaged by the demographic transition theory—its younger

cousin—which is better tuned to the conditions of a modernizing society. It postulates three stages of evolution—from a high fertility/mortality equilibrium to a low fertility/mortality equilibrium, punctuated by a stage known as "demographic transition". The transitional period is characterized by rapid population growth, as declines in mortality, induced by economic and medical progress, outpace the declines in fertility, slower to respond to such progress. Rather than "density", the theory stresses "growth", a more meaningful demographic variable in the context of a dynamic, technology-driven economy. Furthermore, it focuses directly on mortality and fertility and their determinants, rather than on their end product—population size.

Yet, in spite of its greater theoretical depth and indisputable analytical superiority, the demographic transition is no better than the logistic growth theory for providing a reliable basis for forecasting. Each historical experience of demographic change is unique in more than one respect. To be sure, one may well expect, for example, fertility to decline in tropical Africa as that region undergoes modernization. But unless one can be more precise about the timing and speed of the decline, generalizations such as those offered by the demographic transition theory cannot serve as a *modus operandi* for making population forecasts. Again taking tropical Africa as an example, who can guess the future course of mortality now that AIDS has reached epidemic proportions in some of its areas? All too frequently, such unexpected events play havoc with what otherwise appear to be predictable, long-term demographic trends.

Having failed in their bid to uncover a general law of demographic growth as a basis for prediction, forecasters have turned for assistance to observed statistical regularities of a more limited scope. Some denote simple associative relationships; others imply cause/effect relationships; still others typify structural stability, developmental inertia or a sequentiality of events. Fertility declines with an increase in female job opportunities and earnings outside of the home. Economic development brings about higher literacy, lower mortality and, ultimately, lower fertility. And, among many others, there is the well-known "Easterlin effect" of cohort size on fertility through economic opportunities or relative income.

Keyfitz (1982) took a critical look at the theories and statistical models embodying such relationships, with the aim of discovering their utility to forecasters. His conclusion is that, useful though they may be in explaining the past and, in some cases, in the formulation of policies, they are not very useful for forecasting.

> "We have found few instances in which understanding of the past and the conditional relation can be brought to bear on forecasting . . ." (p. 747).

Observed relationships held constant or constrained to vary in a certain fashion may well be helpful in making "conditional projections". But what users are after, Keyfitz points out, is dynamic, unconditional and not *ceteris paribus* types of projections. Conditional projections evade their real query of what actually or probably will happen. Yet it is doubtful that

the past can provide any guidance for the future. There is no symmetry between explanation of the past and prediction of the future.

A renewed effort has been made in recent years to rekindle the predictability concept through a probabilistic approach to projections (Sykes, 1969; Lee, 1974; Alho and Spencer, 1985; Cohen, 1986; De Beer, 1988; Keyfitz, 1989). One can cite as an example Stoto's (1983) attempt to construct confidence limits for future projections from errors (differences between projected and actual population parameters) in past projections.

> "The discovery of stable error distributions allows us to transform the results of the historical analysis into confidence intervals for future populations. These confidence intervals reflect the best efforts of competent demographers in the past, and should be a reliable guide to the present generation's ability to predict the future."

The theoretical foundation of a probabilistic approach to projections is not clear, though one could think of two possible interpretations. The first is to think of a collection of projections analysed for errors, as if it were a random sample drawn from a much larger universe of projections. An attempt such as Stoto's may be seen as being, in theory, of this kind. In practice, however, it is more like an extrapolation of past projection error—with all the pitfalls inherent in any method which extrapolates past trends.

Another interpretation one could offer is that of predictions based on a presumably valid population law (or statistical regularity)—subject, however, to random errors and departures from the trend, due to accidents or to deliberate human interference. For a remote analogy, one may look to the application of statistical probabilities to certain laws in physics. A case in point is Heisenberg's principle of uncertainty, wherein an electron's position and velocity at any instant can be determined only with a certain probability.

With all the accumulation of knowledge on how demographic processes work (or more precisely, have worked in the past) and with all the sophistication of forecasting methods, we must concede to being no closer to getting a glimpse of the future than we were before. The future remains as opaque and elusive to the forecaster's eye as ever. Social processes, unlike some natural processes, are evolutionary, non-repetitive, and hence unpredictable. Nowhere does Heraclitus's aphorism—"you can't step twice into the same river"—apply better than to the ever-changing process of social life. Moreover, in the modern world, changes occur at ever greater speed, and they are increasingly triggered by man's deliberate intervention. While the social process is not pre-ordained or lawlike, neither is it chaotic or mindless. It does not lack coherence and order, and it is teleological in the sense of goal-triggered human action.

This section began with a quotation from the Marquis de Condorcet extolling the virtues of science in predicting social evolution. A contemporary Frenchman, Lesourne (1985), gives us a different and probably more realistic interpretation of social processes.

"Reference to history, then, does not denote the succession of past events, but evokes rather the processes by which time transforms a single past into a multiplicity of possible futures. These processes involve, in addition to chance and necessity as in biology, the will of men who attempt to shape the future as they choose. Chance, necessity, will: these are the three elements of creation and destruction, of permanence and change, of adaptation and ossification. Chance produces a random sequel to the situation of a given moment; necessity involves one variable determining another on the macro or micro level; will substitutes, for passive elements, actors capable of formulating and pursuing strategies." (Translated from the original French; pp. 559-567.)

What Lesourne is saying is that the social process is neither deterministic nor the outcome of free will or sheer chance. Rather, it is a mixture of all these. The opening statement of Lesourne's quotation is particularly meaningful. The reference to history does not mean that we expect the succession of yesterday's events to turn into a "predictable" tomorrow, but rather it illuminates the process by which a unique past opens up to a multiplicity of possible futures.

Practitioners in the art of conjecture about the demographic future must lower their sights. Probability, let alone certainty, is out of their reach. Plausibility is the best that can be hoped for. In most cases, however, the product of the projection exercise yields little more than future-oriented simulation. It is to this subject that we now turn.

Projection as simulation

From their initial, narrowly focused heuristic uses—mainly teaching—forward-directed demographic simulations have increasingly broadened their scope to include policy applications. They are now being used as analytical tools in governmental decision-making and in the evaluation of population-related policies. Simulations are prediction-neutral. No attempt whatsoever is made to predict the future. They are, by definition, "conditional" projections, and tautological in the sense of one set of parameters (input) being transformed into another set of parameters (output) that are relevant to the problem at hand. Demographic simulations present a large bag from which to choose. They vary widely with regard to their purpose and technical complexity.

A distinction could be made between "process-oriented" simulations and "goal-oriented" simulations. In the first case, simulations are designed to generate outcome in terms of, say, the population size and age structure implied in an observed or assumed demographic process of fertility, mortality and migration. They can be used to assess the implications of specific population policies, such as the impact of Canada's immigration policy on population size and age structure or the implications of China's one-child policy on population growth and family structure.

In the second case, a demographic "goal" is set on some grounds; then a simulation is performed to determine the optimum combination of factors or paths leading to that goal. An example of "goal-oriented" simulations is projections carried out by Thomas Frejka (1973) with the purpose of elucidating the demographic conditions necessary to attain a stationary population in various parts of the world at some future point in time. With stationary population as the "goal", a simulation is run to reveal the levels of fertility and the length of time required to reach stationarity under various initial demographic conditions.

Another distinction can be made between "single-purpose" and "multi-purpose" simulation models. The examples above are of the first kind. Confined to a few demographic variables, single-purpose models are relatively simple in their premises, as are the questions they address. Their underlying hypotheses may be simpler, and validation easier. Such models are tailored to specific tasks and can be very useful as heuristic tools for planners and researchers trying to elucidate specific population policy issues.

Multi-purpose models are another matter. Large-scale and multidimensional constructs, they invariably involve highly complex computer operations and call for the input of many socio-economic and demographic factors. They are often designed to reveal the long-term implications of the interaction of these factors. Thus, the model built by Meadows (1974) and his associates at the Massachusetts Institute of Technology simulates the future global development of human society. Parameters for as many as five major areas—population, capital, agriculture, non-renewable resources and the environment—are brought together as input for this model. According to one of its versions (The Limits to Growth), continuation of the trends observed in these five sectors would bring about the collapse of society in the near future. Another version shows the conditions under which an equilibrium of the planetary ecosystem could be achieved.

How useful are these multidimensional, multi-purpose models? There are doubts about their value as planning and policy instruments. The following quotation (Arthur and McNicoll, 1975, pp. 151-265) captures well the scepticism as to their relevance:

> "If there is one underlying source of weakness in these models, it is their aspiring to be multi-purpose. It is this that makes them large, structurally inflexible, overdressed in side issues, and beyond proper validation. Largeness and algebraic complexity are not, in themselves, crimes: complex problems call for complex models, and simulation is well suited to such analysis. But the complexity of development problems puts a premium on the relevance and validity of model specifications and on the wise use of economic theory. A model in which much is irrelevant to a particular issue, is likely to oversimplify and distort the issue. And a model that is concerned more with its own behaviours than with the degree to which its constituent parts capture reality is not a trustworthy guide to policy."

Notwithstanding these criticisms—in my view legitimate—the temptation to engage in large-scale complex modelling can hardly be resisted in

an era of high-power electronic technology coupled with a fascination for holistic visions and systemic analyses. Large-scale, multidimensional models are likely to become even more fashionable in the future. Carefully designed, they could provide a broader framework for the more limited models of the kind mentioned earlier. Demographers and social scientists engaged in large-scale simulation could make a valuable contribution by enhancing the content of these models. So far, the bulk of the work is by systems developers who are more concerned with formal properties than with content.

Projection as prospective analysis

Prospective analysis is conceptually a more complex entity—neither prediction nor simulation, within the meaning assigned to these terms above. It embodies some of the elements of the two, and certain other features. If one pictures the transition from simulation to prediction on a continuum, with predictability ideally increasing in degree along that continuum, then prospective analysis would be found somewhere midway along the axis. The hallmarks of this type of projection are "potentiality" rather than "inevitability", and "plausibility" rather than "certainty" or "probability". These projections aim chiefly at unravelling demographic tendencies. Alfred Marshall (1961), the renowned British economist of the early twentieth century, argues that what is termed "law" in the social sciences is "nothing more than a general proposition or statement of tendencies, more or less certain, more or less definite" (p. 27). This approach to population projections raises a number of issues that are addressed below.

Analytical credibility

The notion of analytical credibility is at the very heart of this conception of projections. The argument underlying the projection assumptions must be persuasive both to the professional peers of the producers and to users. This calls for an analytical framework, or paradigm, designed in such a way as to assist in formulating "credible" assumptions about the behaviour of the parameters to be entered into the projection algorithm. As such, it can be seen structurally as an extension of the algorithm.

The particular configuration of the paradigm will depend on the state of the art of demographic analysis in general and on the nature of the particular parameter to be projected. Some of its desirable common features can, however, be singled out. While flexible enough to accommodate new data and methodological advances, it must be capable of reapplication without major alteration. Reinventing the wheel for each new round of projections is wasteful of time and resources. The selection of parameters describing variables to be projected and the period over which investigation is meaningful in terms of projections are of critical importance (Calot, 1981; Pressat, 1989). Without discounting the "long" run (both retrospective and prospective) as a legitimate object of analysis, the thrust should be directed towards the "short" and "medium" run. It is within such a time

frame, indeed, that the pay-offs in terms of the plausibility of assumptions about the future are likely to be greatest. Particular attention should be paid to the time series of "leading" indicators in order to get some reading of the direction of the trends and to detect any signals of possible reversals in the nearer future. But not only should the analysis rely heavily on those time series that may be regarded as harbingers of tomorrow, it should, furthermore, bring into its purview relevant policies and anticipated events deemed to influence demographic trends in the years to come. While doing all this, one should be conscious of cost and timeliness requirements. In other words, a projection model should possess analytical capabilities and yet be cost-effective. We shall say more on this from a different perspective in the section below.

In the mean time, we will briefly address one particular dimension of the analytical framework—the advisability and feasibility of incorporating reactions to projections from concerned agents (people, special-interest groups, government). It is argued that projections can be "self-fulfilling" or "self-defeating" prophecies, depending on whether or not the anticipated outcome is viewed by the public as desirable. In other words, projections themselves may become one of the factors determining the future course of events. A case in point is the Canadian Government's recent decision to raise substantially the level of immigration in order to avert—or at least to forestall—the spectre of projected population decline. Hence, one could argue that the anticipated public reaction to the projections at the macro level (government policies) and/or the micro level (spontaneous decisions of individual citizens) should be part of the analytical framework. But how such public feedback, even if recognizable, can be conceptualized and operationalized remains a difficult question. The specific case of the Canadian Government's reaction to projections is relatively simple, as it has already become a policy. But what about reactions that can be anticipated only when preparing projections for public release? Commenting on this point in a personal communication, Ryder argues that "if the reaction to projections is taken into account, then one comes up with a different projection—in which case there would be a different reaction. Where does such a process end?" We become trapped in a vicious circle.

I should stop at this point and refer the interested reader to an illuminating article by Grunberg and Modigliani (1954). by incorporating a "reaction function", which relates the observed value of a variable to the previously predicted value of that variable, and by using Brouwer's Fixed Point Theorem, these authors argue that "correct public prediction is possible in spite of the agents' reactions" (p. 471). But there is a catch. Correct public prediction is possible "if the possibility of correct private prediction is accepted" (p. 478). Since they say nothing, however, on a more fundamental issue of the predictability of social events, we are back to the earlier discussion about projection as prediction.

Minimizing the input and maximizing the output

While advocating the need to base projection assumptions on a sound analysis, one should not lose sight of the fact that projection is not an

academic exercise but is, for all practical purposes, a business. Costs and benefits matter. The projection-maker must be cognizant of the up-front price tag accompanying the analytical input to projections. One must balance parsimony with efficiency, quality with timeliness. On the one hand, the number of parameters to be analysed and manipulated (even in this age of powerful computers) must be minimized so as to reduce the cost of the operation. On the other hand, one must select parameters that have analytical potential. "Number crunching" does not in itself guarantee sound analysis. Hajnal's (1955) advice, "less computation and more cogitation", should be a constant reminder to those involved in making projections. Parameters with intuitive value are preferable to purely abstract mathematical parameters. Not only do the former assist in the understanding of the processes being analysed but they also facilitate communication between producers and consumers of projections.

In recent years there have been attempts to develop parameters that have both operational advantages and analytical properties. Thus, there is an advantage to be realized, both operationally and analytically, by focusing on the parameters that capture the levels and age patterns of fertility (Romaniuk, 1973), the two strategically important axes in any fertility analysis. A greater analytical depth can be gained by branching fertility parameters in their period to the parameters in their cohort/parity setting, as proposed by Ryder (1964, 1989). In the case of mortality, one could zero in on child, young-adult and old-age mortality, and choose appropriate mortality functions (Brass, 1974; Heligman and Pollard, 1980). As for migration, it is meaningful to speak of "labour-force", "family" or "retirement-dominated" migration, and then to select relevant parameters from among the mathematical functions found in migration schedules such as those devised by Rogers and Castro (1981).

A viable, truly professional projection programme operating in a business-like manner must be backed up by continuous developmental research. This calls for a balanced allocation of resources between "production" and "R & D". What is needed is a projection model that is cost-effective, one that has a built-in operational efficiency and analytical capability.

The frequency of projections

How frequently should population projections be updated? Some are of the view that they should be done periodically—possibly every year. The projection algorithm, in that view, should be set up so as to take automatically into account the latest population estimates as well as information on fertility, mortality and migration. Others hold the view that new projections should be prepared only when major changes in demographic trends are observed. No great purpose is served by frequent updating when, as is often the case, medium- or long-term demographic scenarios are the prime purpose. It is not certain that the incorporation of the most recent data will better predict long-term trends.

My own view on the question of update frequency is based on pragmatic considerations. Much depends on the extent of demographic change

that has occurred and the amount of work required (and affordable) to generate new projections grounded on solid analysis. This view is consistent with the primacy placed throughout this article on the analytical requirements of projections. The need for readjustments and revisions is mandated by the very nature of the social process as I understand it. On the road to the future, we proceed by *tâtonnement*, trial and error, and readjust to emerging conditions. This applies not only to demographic projections but equally to any enterprise planning for the future. The revision of existing projections and the development of new ones, while respecting a certain periodicity as a policy matter, should, however, be analytically driven rather than done automatically at fixed intervals in time.

Single versus multiple projections

Should the future be depicted by a single projection series or by a range of series embodying alternative assumptions about future fertility, mortality and migration? The former was the prevailing practice in days when it was believed that future population could be predicted by means of some suitable mathematical function reflecting a presumed law or an empirical generalization about the pattern of population growth. A case in point is the use made in the past of the logistic curve. The current practice, almost invariably, is to represent the future in the form of a range of series comprising a "high", a "low" and one or more "intermediate" scenarios. This shift in projection practice came about as a result of both intellectual reorientation as to how we see the future and methodological innovations in the paradigm of population projections.

As evidence accumulated as to the fallibility of population forecasting (with a growing number of projections having been produced), earlier optimism about predictability gave way to a more sober stance. Forecasters became increasingly conscious of the need to incorporate uncertainty about the future into the way the assumptions about it are laid out. At the same time, the cohort-component method (introduced in the 1930s by Whelpton and since adopted as a standard procedure in population projections) broadened the scope of analysis and hence of the rationale for alternative assumptions about the course of vital rates.

Setting the range of projections involves a judgemental compromise between, on the one hand, the pervasive uncertainty about things to come and, on the other hand, what appears analytically plausible (at least in the short and medium run), practical and manageable in using alternative series. The provision for a widening range as time elapses, often embodied in projections, underscores the growing degree of uncertainty as we move along the time axis from the base population (see the section below on time horizon).

Having accepted that the more prudent course of action in generating projections is that of utilizing alternative assumptions, the next question is whether the stated scenarios should be given an order of preference. Views on this question tend to vary. On the one hand, there are those who pro-

fess a strict neutrality with respect to choosing among alternative projections. They stress the uncertainty inherent in the future and invoke the past failure of professional demographers to predict the advent of certain major events such as the baby boom or, more recently, the baby bust. On the other hand, there are those who feel that it is the professional responsibility of producers to assist users in selecting among the offered series. There is obviously no guarantee that, even in the relatively short and medium run, trends will materialize as projected, however credible an analysis may look in suggesting the most likely course of events. But credible analysis is perhaps the only criterion available with which to make a "rational" choice under conditions of uncertainty, when a choice has to be made.

Statistics Canada is one agency known to me that has an explicitly stated policy on the two questions raised above regarding population projections. It stipulates:

> "There should be several estimates for each future reference date. These alternatives should be the product of different but clearly stated assumptions or else the product of alternative specifications of the model. No single set of estimates should be labelled as most probable." (Statistics Canada, 1986)

Time horizon

There are no universally valid criteria for determining the optimum time horizon for a population projection. Short-term projections—monthly, quarterly or even annually—such as those that forecast interest or unemployment rates make little sense in demography. Demographic phenomena are not volatile enough to make a sufficient dent in population size and age structure over the short term. It may take several decades for a demographic event to send shock waves through the population renewal process. It may take even longer for a population to achieve stability in its age structure and growth rate after a fixed schedule of fertility and mortality has emerged.

Between these more extreme situations, however, the empirical evidence reveals a wide range of variability in the wave length of demographic phenomena. It took about 26 years for the ascending phase of the baby boom in Canada and the United States of America to reach its summit in 1959. The descending phase, the baby bust, evolved faster, to reach its nadir of about 1.7 in the late 1970s. For the past 10 years or so, the total fertility rate has remained nearly stable. Shifts in reproductive habits, it can be speculated, may take place when the younger generations come of age in the child-bearing process. This may occur every 26 years, a period roughly equivalent to the mean length of a generation as measured by the mean age of mothers at the birth of their children.

Of even greater stability are trends in mortality. The expectation of life has steadily inched up for several decades. Yet even here, a closer inspection of the time series reveals a succession of phases of smaller and

greater gains in longevity. A further analysis would reveal that the points of inflexion in the trends coincide with the advent of major health-care and life-style innovations.

By contrast, migration is typically much more volatile, with cycles of shorter duration but wider amplitude. In Canada, to take an example closer to this author's scene, the average duration of the international migration cycle—the ascending and descending phases combined—since the Second World War has been roughly seven years. Volatile, but far from chaotic, are changes in the direction and magnitude of internal migratory currents. At least four major migratory patterns, largely dominated by shifts in regional economic fortune, have been witnessed in Canada since the Second World War.

What these observations suggest is the existence of demographic patterns durable enough to justify medium-term—if not long-term—projections. To project demographic tendencies over a period of 10-25 years is not an unreasonable venture. Anything beyond that time-frame should be regarded as an exercise in simulation to show the long-term implications for population size and age structure of observed or assumed tendencies in fertility, mortality and migration.

The usefulness of projections

If we accept the fact that population cannot be predicted, then why make projections? What purpose do they serve? The answer is that plausible assumptions can be made about demographic tendencies, and those assumptions play a useful role in decision-making. (Plausible assumptions are all that can be hoped for as a basis for "rational" decisions under conditions of uncertainty.) This is not very different from what can be said about plans, projects or expectations in making decisions. More often than not, in real life, these various anticipations exceed or fall short of the actual attainments and have to be readjusted, in the course of time, to emerging conditions. Yet they trigger new initiatives and actions; they are indispensable aids in managing the future.

In talking about the usefulness of projections, two points need to be emphasized. One refers to the notion of "understanding" and its bearing on decisions. "Understanding" the processes that lead into the future is important in preparing for it; "understanding is the only appropriate method of dealing with the uncertainty of the future conditions", wrote Ludwig von Mises (1963). This is why, throughout this paper, so much value is placed on the analytical credibility of projections.

The other point refers to the way the future is conceived as being either something that is to be discovered or something that is to be created. This distinction should be borne in mind when assessing the usefulness of projections. If gauged by the degree to which they predict population, the results may indeed be deceptive. But if the question is switched around by asking to what extent they have been instrumental (irrespective of whether they turn out to be right or wrong) in "creating" the future,

judgement about their usefulness may become much more positive. A survey carried out among users of projections may indeed reveal some startling figures about the amounts of money invested or traded or about new schools and hospitals to be built as a result of population projections. Eventually, a welfare function may be discerned—namely, that we are better off with than without projections. Consequently, looking at projections from the perspective of "creating" the future casts a different light on their usefulness. It gives them a different twist from the conventional one emphasizing their predictive value. With Peter Drucker (1964, 1969), we shall ask "not what will tomorrow look like", but instead "what we have to tackle today to make tomorrow".

Conclusion

I have attempted in this article to clarify the meaning of projections in terms of prediction, simulation, and prospective analysis. Whether or not I have succeeded is up to the reader to judge. I am, however, under no illusions that, despite all admonitions to the contrary, a great many users of projections will not continue to view them as if they were predictions, or forecasts—to use a slightly less loaded term. This, however, should not deter those who are in the business of making projections either from bringing some conceptual clarity to the various types of future-oriented endeavours in which they are involved or from imparting some of their insights to the more sophisticated users of projections.

This paper differs from many writings on the subject in that it does not lament the "dismal record" of projections in correctly predicting population. In fact, one of the principal tasks of this paper was to de-emphasize the predictability feature, and stress instead the analytical credibility of demographic projections. This shift in emphasis has an important implication for assessing the usefulness of a projection: the performance is to be gauged not so much by the degree to which the projection predicts the future population[2] (something that can only be verified *ex post facto*) but rather by the extent to which it contributes to the decision-making processes that shape the future. In other words, the emphasis is on projections as an instrument of "creating" rather than "discovering" the future.

Notes

[1] A logistic curve, fitted to a population time series over the 1610-1910 period, predicted that the population of the United States of America would reach its ceiling early in the twenty-first century, at 200 million, with a standard deviation of 10 million (see Schultz, 1930). That number has already been exceeded (241,095,000 in 1986) by 21 per cent, or by 15 per cent of the upper limit (one standard deviation) of the predicted figure. Even so, the performance is not that bad for an 80-year forecast. Furthermore, were it not for the growth momentum built into the age structure (for which the logistic function cannot account) and to some extent for uncontrolled immigration, the actual United States population would already have reached its ceiling—a stationary population well within the range forecasted by means of the logistic function.

[2] This statement should not be taken as negating the legitimacy of research designed to measure the performance of projections against actual population. In addition to its historical interest, it may provide some indication as to the magnitude of deviations one can expect in future projections. But this is neither a sufficient nor even the most important criterion for appraising the usefulness and the relevance of projections.

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URBAN AND RURAL POPULATIONS AND LABOUR-FORCE STRUCTURES: CURRENT PATTERNS AND THEIR IMPLICATIONS

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SUMMARY

This article reviews differential urban and rural patterns of age and sex structures of the population and labour force in developed and developing countries, their determinants, and their linkages with agricultural and rural development issues. Typical urban and rural age structures are first examined, and it is shown that they can be a result of at least two contrasting migration patterns. Labour-force age structures are considered next, showing that urban/rural differentials are of a similar nature in developed and in developing countries but that distortions are more accentuated in the latter. Next, the article addresses the subject of the aging of rural labour forces in developing countries and finds little evidence of it at the country level. Some countries do exhibit aging rural working-age populations, but others show increasingly younger age structures in that same group. Finally, the economic causes and consequences of rural-to-urban migration and labour-force structure differentials are briefly reviewed, with particular attention to land distribution and tenure, technological changes (mechanization, irrigation), and types and levels of agricultural production.

URBAN AND RURAL POPULATION STRUCTURES

In the long run, age structures are affected most by fertility levels and, to a lesser extent, by mortality. But they can also be affected to a notable extent by migration, both directly (when migration is more intense in specific age groups, as is usually the case) and indirectly (through changes in fertility and mortality induced by migration). Sex structures are also affected by migration. Urban sex and age structures differ from rural ones in virtually all countries. As a rule, urban areas have higher proportions of adults, while rural areas have higher proportions of children and the elderly.

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There are of course differences in the exact age ranges in which urban and rural populations exhibit structural differences. For example, as shown below, out of 1,000 rural and 1,000 urban residents, Ethiopia has a broader range of urban "adult over-representation" (from exact ages 10 to 40) than Indonesia (from ages 15 to 35).

Country	*Age group*	*Urban*	*Rural*	*Rural/urban*
Ethiopia	0-9	297	342	1.15
	10-39	544	456	0.84
	40 and over	159	202	1.27
Indonesia	0-14	386	415	1.08
	15-34	375	311	0.83
	35 and over	239	274	1.15

Table 1 shows the typical patterns of urban and rural age distribution.

TABLE 1. URBAN AND RURAL AGE DISTRIBUTIONS (PER 1,000 PERSONS) IN TWO DEVELOPING COUNTRIES

	Ethiopia (1984)		*Indonesia (1980)*	
Age group	*Urban*	*Rural*	*Urban*	*Rural*
0-4	155	180	138	146
5-9	142	162	129	149
10-14	128	125	119	120
15-19	113	87	125	98
20-24	96	69	108	83
25-29	82	63	84	75
30-34	68	59	58	55
35-39	57	53	56	59
40-44	44	46	48	52
45-49	31	37	37	43
50-54	22	31	33	38
55-59	17	25	21	24
60 and over	45	63	44	58

Source: Based on *Demographic Yearbook 1984* (United Nations publication, Sales No. E/F.85.XIII.1), table 7, pp. 222-223, 238-239.

Obviously, differences in fertility and mortality levels or patterns cannot explain such differences, which are essentially ascribable to rural-to-urban migration.

It is interesting to note, in this respect, that urban and rural age structures such as those described here, although broadly similar from country to country, can be the result of very different migration patterns with regard to the sex structure of migration flows. This is the case as far as the two countries in question are concerned: in Ethiopia rural-to-urban migration has been predominantly female, while in Indonesia it has been predominantly male. Urban and rural sex ratios give a measure of that fact:

	Urban	*Rural*
Ethiopia	86.7	101.1
Indonesia	100.2	98.4

The pattern of predominantly male rural-to-urban migration, if identified by the existence of a majority of males in the urban population *and* a majority of females in the rural population, is found mostly in Africa. By contrast, the pattern of a predominantly female rural-to-urban migration, if identified by the existence of a majority of females in the urban population *and* a majority of males in the rural population, is found mostly in Latin America and in some developed countries.

URBAN AND RURAL LABOUR-FORCE STRUCTURES

Obviously, the structures of urban and rural populations have an influence on the structures of the respective labour forces. In particular, being relatively short of adult workers, rural populations have to rely on their young and older members for carrying out production and other economic activities. This can be observed both in developed and in developing countries, as shown by table 2. Because of the often poor quality of statistics on female participation in the economically active population (especially in rural areas), the table deals with male labour forces only.

TABLE 2. AVERAGE AGE STRUCTURES (PER 1,000 PERSONS) OF THE URBAN AND RURAL MALE LABOUR FORCES IN 10 DEVELOPED AND 11 DEVELOPING COUNTRIES

	Developed countries[a]		*Developing countries*[b]	
Age group	*Urban*	*Rural*	*Urban*	*Rural*
19.....	48	63	143	210
20-29.....	267	242	296	236
30-39.....	257	212	230	192
40-49.....	212	209	169	160
50-59.....	159	182	102	112
60 and over...	57	92	60	90

Source: Based on *Demographic Yearbook 1984* (United Nations publication, Sales No. E/F.85.XIII.1), table 26, pp. 541-560.

[a] Austria, Bulgaria, Canada, Denmark, Finland, France, Hungary, Japan, Poland, Sweden.

[b] Afghanistan, Argentina, Bangladesh, Brazil, Cameroon, Honduras, India, Iran (Islamic Republic of), Nepal, Pakistan, Vanuatu.

The pattern is the same in developed and in developing countries, although more accentuated in the latter: rural labour forces have comparatively more members aged under 20 and over 49, while urban labour forces have more members aged 20 to 49.

It is interesting to compare briefly the patterns of the developed and developing countries. In relative terms, the importance of the young (under age 20) in the labour force is more than three times greater in developing countries than in developed countries. Adults (20-49) have about 10 per cent less importance, and older workers (50 and above) have about 25 per cent less importance in developing countries than in developed ones.

It is not clear whether the rural labour force is aging in the strict sense in many countries. It is difficult to ascertain trends because of the lack of data for two comparable points in time). From a look at changes in the structure of the rural working-age population of certain developing countries, a mixed picture emerges (see table 3). In the case of Tunisia, there *has* been slight aging; the proportions over age 49 have increased, the proportion under age 20 has decreased, and the estimated average age of the sub-population studied has gone up slightly. As a matter of fact, it is reported that in Tunisia the majority of adult male farmers are now over 55 years old. In much of the Near East, the agricultural labour force appears to be aging as a result of migration, which has sharply reduced young adult male labour (FAO, 1988). In the other three countries presented in table 3, however, the trend is in the opposite direction: the rural population of working age has grown younger as a result of the growing importance of the age groups below 30, and the estimated average age has declined. One explanation could be the diminishing intensity of rural out-migration at ages under 30. In order to draw firmer conclusions, it would be necessary to collect and analyse more data, but in the absence of computerized data bases, that would require a lot of research.

There seem to be two types of situation, both of which can exist within the same country. In the first, men migrate out of the rural sector, for short or longer periods of time, but leave behind their wives and children. Usually fertility is not affected much by such a migration pattern, since the women take over the responsibility of agricultural production and want children to assist them with farm work. Thus, the proportion of the aged increases, but so does the proportion of children at work. Neither the rural population nor the rural labour force is likely to age markedly, if at

TABLE 3. CHANGES IN THE COMPOSITION (PER 1,000 PERSONS) OF THE RURAL POPULATION OF ACTIVE AGE IN FOUR DEVELOPING COUNTRIES, BY BROAD AGE GROUPS, 1970 AND 1980 CENSUSES

	Tunisia		*Cameroon*		*Myanmar*[a]		*Bangladesh*	
Age group	*1975*	*1984*	*1976*	*1986*	*1973*	*1983*	*1974*	*1981*
10-19.....	347	338	294	304	299	317	322	364
20-29.....	205	225	194	216	214	237	205	221
30-39.....	141	132	172	165	174	151	178	155
40-49.....	132	113	140	123	130	115	123	111
50-59.....	88	95	98	89	96	93	81	74
60 and over ...	87	97	102	103	87	87	91	75

Sources: Based on *Demographic Yearbook 1982* (United Nations publication, Sales No. E/F.83.XIII.1), table 7, p. 226; *Demographic Yearbook 1983* (United Nations publication, Sales No. E/F.84.XIII.1), table 7, p. 226; *Demographic Yearbook 1984* (United Nations publication, Sales No. E/F.85.XIII.1), table 7, p. 220; and *Demographic Yearbook 1986* (United Nations publication, Sales No. E/F. 87.XIII.1), table 7, pp. 224, 230 and 240.

[a]Formerly Burma.

all. In the second type, whole families—more frequently, young couples—leave the rural sector, and then aging in the real sense takes place. The critical factor is whether women of child-bearing age migrate or not, be it on their own or as members of family groups.

The above analysis does not deal with developed countries, where the situation is well known (in its main features) and rather stable. Rural populations and the labour force are rather "old" already—they have been so for decades, following a long process in which migration and progress in schooling have subtracted most of the younger work force from the active rural population.

Labour-force structures and agricultural development

Rural labour-force structures and the migration movements that contribute to shaping those structures have many linkages with agricultural and rural development policy issues. In those linkages, cause/effect relationships run both ways.

In broad terms, rural-to-urban migration has been and is influenced by differences in economic opportunities and general living conditions between rural and urban areas.[1] When one tries to be more specific about the determinants of migration, however, things become both more complex and more elementary. The complexity stems from the fact that many factors influence the set of opportunities which migration makes it possible to exploit—depending on a local economic and social situation and on corresponding situations in a range of potential destination areas. The simplicity stems from the fact that the motivations for migration essentially boil down to a need for economic security at the household level (entailing the diversification of the family's activities or, in other words, spreading its human capital over a range of sectors or subsectors) and for cash—which is, *inter alia*, an aspect of the need for security.

Relationships between agricultural systems (and their changes) and migration are complex. Access to land, for instance, has strong relevance. Landless agricultural workers usually are the most inclined to migrate, and households with holdings that are too small are prone to send out part of their work-force on short- or longer-term migration. As a matter of fact, inequality in land distribution can induce migration at both ends of the scale (with landlords organizing urban education and careers for their children). But land-tenure status is important too. If agricultural workers are dependent on a landlord, migration is inhibited. This is why, while some agrarian reforms have succeeded in limiting rural out-migration or even in reversing it, others have accelerated it or have increased the volume of temporary migration substituting for permanent migration (Peek and Standing, 1979).

Technological change affects migration levels and patterns through its impact on employment and incomes. Historically, it can be pointed out, as a start, that the capital-intensive agricultural development strategies which prevailed in developing (and developed) countries during the third quarter

of this century have led to the excessive mechanization of agriculture, to an increase in agricultural underemployment and to rural out-migration (FAO, 1974, and Findley, 1982). Those strategies have, moreover, encouraged inegalitarian agrarian structures (with a modern subsector comprising large mechanized farms employing a small amount of labour and a traditional subsector of small farms without much prospect for expansion), which have been detrimental to the intensification of production and to employment.

Of course, the effects of technological change on the propensity to migrate vary. Mechanization itself has two faces. When it affects operations situated downstream from planting and harvesting, it displaces labour (and should be confined to the easing of seasonal labour shortages). In other cases, it may make it possible to practise multiple cropping and thus increase labour requirements. Other technical changes increase those requirements in the same fashion or because they entail additional activities, such as the application of fertilizers. Irrigation typically reduces considerably the existing incentives to emigrate. However, even this effect is not simple: some households may take up migration in order to invest in their farms using migrants' remittances; or irrigation schemes may create or accentuate inequalities and land concentration, thus fostering migration again.

The migration-inhibiting effect of irrigation and of other technological changes which raise labour productivity lies in the betterment of rural incomes. Associated changes in cropping patterns have the same effect; new labour-intensive, high-value crops (e.g., coffee, tea, tobacco) may bring about increases in household incomes which reduce incentives to seek cash incomes elsewhere. However, this might not affect much the migration strategy of households that seek security through diversification more than cash earnings as such.

In turn, biased labour-force structures affect agricultural and rural development patterns and prospects. Clearly, they first entail changes in the organization of production. Field studies confirm macro-level statistics in indicating that women's participation in agricultural production is heavier in male emigration areas (and vice versa), and that children's work increases in all cases.

There is controversy over the short-term effects of out-migration on agricultural production. Dualistic theory asserts that the effect is nil, because tasks are shared between workers, so that when surplus labour is siphoned off, the same level of production can be maintained by a reduced labour force. However, almost all empirical studies invalidate the hypothesis of a zero marginal productivity of labour in emigration areas. It appears that the labour and resources allocation is usually efficient and that a reduction in labour force, if not effected during the off-season, results in a loss of productivity.

In the longer run, emigration can influence the level of production through various mechanisms. For example, a fall in production may be experienced by a population which has to meet smaller local subsistence

needs, which lacks ready access to the technical and financial means required for intensification and whose physical capacity has been reduced (because it must rely more on women, children and elderly people).

Other effects bear on the type of production. Quite often, food crops receive more attention than cash crops, because the latter generally require more work. However, in certain ground-nut- and cotton-growing regions in West Africa, where it was difficult to modify the priority given to export crops, emigration seems to have affected food production and, in particular, to have played a role in triggering famines in the 1970s.

NOTE

[1] Attempts to dichotomize descriptions of those differences according to whether they are done from the rural angle ("push") or from the urban one ("pull") are not very useful. They may even become counter-productive from the standpoint of policy formulation. Push and pull are one and the same thing (see Dasgupta, 1984).

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IMPROVEMENTS IN THE CENSUS QUESTIONNAIRES AND HANDBOOKS THAT GATHER INFORMATION ON THE FEMALE LABOUR FORCE IN LATIN AMERICA

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SUMMARY

This article analyses the methods used by Latin American censuses of the 1980s to gather information on labour-force participation, with emphasis on possible weaknesses and strengths in measuring women's economic activity. A comparison is made with censuses of the 1970s. Census questionnaires and enumerator's handbooks are systematically examined with regard to the following: question(s) on activity status; special instructions for identifying economically active women; and the specification (or not) of minimum time worked during the reference period to classify a person as economically active.

The analysis shows a picture of general improvement in the ability of Latin American census questionnaires and enumerator's handbooks to gather information on women's labour-force participation from the 1970s to the 1980s. Two kinds of changes were observed: those specifically designed to improve the identification of economically active women and technical modifications not specifically geared to either sex. It is thought that changes of the first kind were at least partially the consequence of a specific recommendation by the United Nations Statistical Commission for the 1980 round of population censuses with reference to the gathering of information on female labour-force participation and of the activities of the United Nations Decade for Women for the general improvement of statistics on women.

INTRODUCTION

The United Nations Decade for Women (1976-1985) gave rise to a wave of studies, many of which emphasized the inability of statistics sys-

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tems to record the real dimension of women's contribution to development. More specifically, during those years there was an accumulation of publications addressing the issue of the population census underestimation of women's participation in the labour force in developing countries.[1]

Examination of census instruments to record women's economic activity was done in a particularly systematic way for the Latin American censuses of the 1970s (Recchini de Lattes and Wainerman, 1979 and 1986; Wainerman and Recchini de Lattes, 1981).[2] Now, on the eve of the 1990s censuses, it is appropriate to examine the 1980 censuses in the light of the activities of the Decade to improve the quality of statistics on women. This article presents an analysis of the methods used by Latin American censuses of the 1980s to gather information on labour-force participation, with emphasis on possible weaknesses and strengths in recording working women. The analysis reveals the improvements over the censuses of the 1970s. It is hoped that it will be of use to census bureaux in developing regions other than Latin America.

International recommendations for population censuses and the Decade for Women

The international recommendations for population censuses aim at guiding countries in the improvement and comparability of census results. Since recommendations are addressed to countries of very different socio-economic and cultural backgrounds, the definitions and specifications of topics are rather general. For this reason recommendations do not provide operational advice about the questionnaire (i.e., question wording) or about the instructions to be given to census enumerators. Recommendations are on broad procedures, leaving room for each country to take its own decisions in the planning of the census, and particularly in the preparation of the questionnaire (type and format, wording and arrangement of questions) and the enumerator's handbook.

Two sets of recommendations have been guiding Latin American censuses since 1950: those formulated by the Statistical Commission of the United Nations Secretariat and those emanating from the Committee for the Improvement of National Statistics (COINS) of the Inter-American Statistical Institute (IASI). On the economic characteristics of the population, both sets of recommendations are based on the International Labour Organisation (ILO) recommendations on the subject. Because of their common origin and the fact that the two organizations work closely together,[3] the sets of recommendations have been practically identical for every census round.

Up until the 1980s, census recommendations used the labour-force approach to register economic characteristics of the population.[4] (Some of the concepts used in that approach have provoked widespread comment and criticism,[5] which need not be dealt with here.) Recommendations were written without attention to sex until the 1970s—that is, they ignored the diversity of circumstances and characteristics of economic activities per-

formed by women and men and the particular problems encountered by the collection of statistics on female work. The United Nations recommendations for the 1980 censuses were a clear departure from that trend, since they included, in paragraph 2.190, a warning about the difficulties of classifying women as economically active. The paragraph emphasized the need explicitly to instruct the enumerators "to ask about the possible economic activity of the women in the household exactly as they do for men" (United Nations, 1980a, p. 93).

The introduction to paragraph 2.190—probably drafted earlier than 1980—was part of a series of activities undertaken in relation to the United Nations Decade for Women.[6] In 1980 the Programme of Action for the Second Half of the Decade recommended that the United Nations, the regional commissions and the specialized agencies collect and publish statistics on women, and produce studies for the improvement of indicators and statistics on the situation of women (United Nations, 1980b). The Decade's general activities probably contributed to wider awareness of women's issues, which no doubt had an indirect influence on the persons in charge of census tasks.

A QUALITATIVE ANALYSIS OF CENSUS INSTRUMENTS

Certain aspects of the questionnaires and enumerator's handbooks used in the 1970 Latin American censuses to gather information on activity status have already been extensively analysed: the questions (or headings) in the questionnaires and the corresponding instructions in both questionnaire and handbook; the reference period for the definition of economic activity; the minimum-time requirement for a person to be classified as belonging to the labour force; and the general instructions to enumerators. The analyses found frequent technical and conceptual problems; inconsistencies of two types—between a question and the corresponding instruction or between questions; and some gender biases encouraging the identification of women as homemakers instead of as economically active (Recchini de Lattes and Wainerman, 1986).

The measurement of activity status by the 1980 censuses does not show dramatic changes in comparison with the 1970s. Questionnaires and handbooks show small modifications from the 1970s to the 1980s, some of them clearly in the direction indicated in the above-mentioned paragraph 2.190 of the 1980 United Nations recommendations. Frequent imperfections in the 1970 censuses are less common or no longer found in the 1980s, and, on the whole, a positive picture emerges.[7]

The section below presents a global analysis of instruments used by the 1980 Latin American censuses for the measurement of the labour force, with emphasis on the continuation of or departure from the patterns observed for the 1970s. Table 1 lists the 20 Latin American censuses taken in the 1970s analysed in a previous work by Wainerman and Recchini de Lattes (1981), and the 16 taken in the 1980s up to early 1988 and analysed here. (English-speaking Caribbean countries have not been included in the

TABLE 1. DATES OF LATIN AMERICAN CENSUSES OF THE 1970s AND 1980s

Country	*1970s*	*1980s*
Argentina	30-9-1970	22-10-1980
Bolivia	29-9-1976	..
Brazil	1-9-1970	1-9-1980
Chile	22-4-1970	21-4-1982
Colombia	24-10-1973	15-10-1985
Costa Rica	14-5-1973	10-5-1984
Cuba	6-9-1970	11-9-1981
Dominican Republic	9-1-1970	12-12-1981
Ecuador	8-6-1974	28-11-1982
El Salvador	28-6-1971	..
Guatemala	26-3-1973	23-3-1981
Haiti	31-8-1971	30-8-1982
Honduras	6-3-1974	..
Mexico	28-1-1970	4-6-1980
Nicaragua	20-4-1971	..
Panama	10-5-1970	11-5-1980
Paraguay	9-7-1972	11-7-1982
Peru	4-6-1972	12-7-1981
Uruguay	21-5-1975	23-12-1985
Venezuela	2-11-1971	21-10-1981
TOTAL	20	16

Source:*Demographic Yearbook 1983* (United Nations publication, E/F.84.XIII.1) and information kindly supplied by the Centro Latinoamericano de Demografía (CELADE).

analysis, since both their census practices and their cultural patterns differ greatly from those of the rest of the region.) The analysis is based on questionnaires and enumerator's handbooks of all 1980 censuses except that of Cuba, for which only the questionnaire was available to the author.

THE QUESTION(S) ON ACTIVITY STATUS

The 1970s census questionnaires used one of two approaches to gather information on activity status: a question that interviewers had simply to read to respondents, or a heading (title) in the questionnaire which left enumerators free to improvise whatever phrase they chose to gather the information (Wainerman and Recchini de Lattes, 1981, pp.81-92). The heading—clearly the poorer of the two instruments, since it does not assure consistent presentation—was used by four countries in 1970 (Costa Rica, Haiti, Peru and El Salvador) but by none of the 16 censuses examined for the 1980s, which used one or more questions.

As in the 1970s, the 1980s questions were of the form "What did you do during the past week?". The question was followed by the presentation of a list of precoded alternative answers, the first of which was "worked" or something similar, followed by one or two alternatives for the "unemployed" category (looking for a job, whether having worked before or not) and, finally, by those referring to economically inactive persons (i.e., homemaker, student, retired). In the 1970s, 10 out of the 13 censuses

which used a question instructed the interviewer to stop at the first affirmative answer. The order of presentation of the alternatives attempted to give priority to the economically active. But three of the 1970 censuses instructed interviewers to read all the alternatives, probably inducing many women to choose among the options that appeared most desirable (such as homemakers or students) and thus failing to record many of the women as economically active. In 1980, all but one of the censuses (Guatemala) instructed interviewers to stop at the first affirmative answer.

In 1970 three census questionnaires gave more than the usual space to the activity status topic, using more than one question to collect the information: Brazil (three), Panama (two) and Venezuela (eight).[8] In 1980 the same group of countries plus the Dominican Republic used several census questions for the topic.

Brazil drastically changed the instrument used in 1970, substantially improving it. Instead of the confusing double negative of 1970,[9] the 1980s instrument was split in two, with a wording very similar to that in censuses using just one question. The first question ("Did you work in the last 12 months?") supplied information on persons who worked. For those who answered negatively, the second question covered the alternatives, the first one being "looking for a job, having worked before or not", to which the rest of the usual alternatives followed (retiree etc.).

The first two questions of the Panamanian census ("Did you work or have any employment last week?" and "Did you look for a job last week?") provided alternatives only to economically active persons: the employed and the unemployed. But, in an attempt not to misclassify anyone who might have incorrectly answered negatively to both questions, a third question asked why the person was not looking for a job. The first four alternative answers to the last question [10] would have "rescued" persons wrongly classified in the first two as economically inactive. The last seven alternatives provided the usual "inactivity" categories.

The Venezuelan 1980 set of seven questions [11] was similar to the 1970 set. The 1980 census was previously highlighted as an outstanding instrument for recording economic activity, since the investigation on activity status was as detailed as in a household survey questionnaire (Wainerman and Recchini de Lattes, 1981). The group of seven questions used by the Dominican Republic census of 1981 resembled those of the Venezuelan, or, again, those of a household survey, questionnaire. In short, both questionnaires were designed with an emphasis on labour-force measurements and therefore probably met that objective more efficiently than censuses that did not emphasize the topic.

The Mexican census could be added to the list of those that gave additional space to the investigation of activity status. Although, formally speaking, the 1980 census used only one question (a question with only one identification number in the questionnaire), in reality it used many questions, since each of the alternative answers was presented with a carefully phrased question. For example, the alternative for "employed" read: "Did you work as a salaried worker, or as an employer, on your own

account, or as a member of a production co-operative?" This type of instrument undoubtedly more fully ensures the consistency of presentation of the alternatives to interviewees—so necessary for the validity of the results—and it is, therefore, a clear improvement over the 1970 census.

This brief analysis demonstrates a significant improvement from the 1970s to the 1980s in the census instruments that measure activity status. Although the improvement is far from general, the proportion of censuses with relatively good questionnaires is higher in the 1980s.

Special instructions to identify economically active women

Only two of the 1970 censuses included specific instructions to enumerators for detecting those who were economically active but could have been incorrectly classified otherwise. In those two cases the handbooks indicated that when a respondent declared himself or herself a homemaker, student or retired person, the interviewer should verify that the person really had not worked.

Many of the 1970 census manuals encouraged interviewers to classify women as homemakers, either by the way the instruction was phrased (saying, for example, that "women should be classified as homemakers", instead of using a gender-free expression like "persons"), or by presenting graphic illustrations with female characters in domestic roles and male characters involved in economic activities (see fig. I) (Wainerman and Recchini de Lattes, 1981, pp. 79-99).

In the 1980s most censuses had changed their approach. The majority of the enumerator's manuals either avoided a stereotyped presentation of instructions and illustrations or explicitly warned against the sexual stereotype.

All the countries except Brazil avoided the stereotype.[12] Seven of them[13] also warned interviewers against it. In those seven cases, manuals instructed interviewers to continue the investigation for women who had been reported as homemakers, since those women might also have been doing some work for profit and, if so, should be classified as economically active. Most of the seven countries also gave examples of economic activities that women usually engage in at home preparing food or sweets for the market; working as a weaver, a laundress etc.). That device probably helped to recover many economically active women otherwise recorded as inactive. An eighth census (Colombia) noted in its instructions that homemakers were not necessarily women and, in doing so, warned against that frequent domestic stereotype.

Two additional censuses went beyond avoiding the stereotype but did not go so far as to warn against it. Both employed graphic illustrations helping to suggest that women were frequently engaged in economic activities. The female characters in the illustrations of the Dominican Republic census play exclusively economic roles, while the Peruvian illustrations include women engaged in both domestic and economic activities, acknowledging the double role often played by them (fig. II).

Figure I. Illustrations for the activity status question from the enumerator's handbook, Bolivian population census of 1976

1. Did you work?
2. You didn't work but did you have a job?
3. Unemployed?
4. Did you look for a job for the first time?
5. Only domestic chores?
6. Only student?
7. Retired?

Unfortunately not all graphic illustrations of the 1980 censuses followed the pattern of those two. In the Ecuadorian and Paraguayan censuses, the instructions for the activity status questions depicted exclusively male figures engaged in economic activity and female figures as homemakers. Nevertheless, they differed from those of the 1970s in certain important ways: they avoided stereotyped wording, they utilized drawings of female characters engaged in productive activities in the questions about industry or employment status addressed to those economically active and, in the case of the Ecuadorian census, they warned against the sexual stereotype.

Time requirement to classify a person as economically active

An important element in census questionnaires and enumerator's handbooks is specification (or not) of a minimum amount of time worked during the reference period in order to classify a person as economically active and, for those schedules that include a time requirement, the way it is used. Since full-time work is conceptually different from part-time, a variation in the treatment of the minimum time requirement is crucial to the comparability of labour force among countries, especially among women, because part-time and occasional employment are much more fre-

Figure II. Illustrations for the question on activity status from the Peruvian 1981 population census

The upper panel depicts persons who work in a family business. The lower panel depicts a typical situation in rural areas: a woman prepares the family meal *and* does productive agricultural work.

quent among adult women than among adult men. The ways chosen to operationalize the concept led to a number of problems for the validity and reliability of labour-force measurement.

Different treatments of the time requirement introduced considerable extraneous variation into the 1970 round of Latin American censuses. The differences reflected the lack of an international standard on this aspect of the conceptual definition of labour force. Latin American censuses range from no time requirement to time specifications varying from almost full-time workers (most of the reference period) to occasional workers (such as when the census required as little as one hour per week to classify a worker among the economically active), as can be seen in table 2.

The 1980 censuses present a similar picture. Most censuses (10 out of the 16) required—vaguely or precisely—an amount of time that the person

TABLE 2. MINIMUM TIME THAT CLASSIFIES PERSONS AS ECONOMICALLY ACTIVE IN LATIN AMERICAN CENSUSES OF THE 1970S AND 1980S[a]

Not stated	*One hour*	*One day*	*Part of reference period*	*Most of the week*
		1970		
Brazil El Salvador Haiti Panama Peru Uruguay	Colombia Costa Rica Mexico Venezuela[d]	Chile[b] Cuba Guatemala Honduras	Dominican Republic	Argentina Chile[c] Ecuador Nicaragua Paraguay Venezuela[c]
		1980		
Argentina Cuba[c] Dominican Republic Haiti Mexico[g] Uruguay	Colombia Costa Rica Peru	Guatemala	Brazil[e] Panama[f] Venezuela	Chile Ecuador Paraguay

[a] Information is based on either questionnaire or handbook, unless otherwise stated.
[b] According to enumerator's handbook.
[c] According to questionnaire.
[d] "A few hours", according to enumerator's handbook.
[e] "Part of the time" (of the 12-month reference period) was required to classify a person as working. The "last two months" was required in the categories "looking for a job—already worked" and "looking for a job—never worked before".
[f] "No matter what amount of time."
[g] The first two alternatives on activity status—working—were immediately followed by a question on the number of hours worked. It is not known whether the number was used to classify the population as economically active.

had to have worked during the reference period in order for the person to be included among the "working".[14] As in the censuses of the previous decade, the amount of time varied from a maximum of "most of the period" to a minimum of "at least one hour". Six censuses do not stipulate any time at all. Details on the amounts of time and the countries are given in the footnotes to table 2.

The censuses that included a time requirement used various ways to specify it, both in the 1970s and in the 1980s. The ways reveal a lack of attention to technical details, which later became a source of error in the collection of statistics on the economically active population. The two most frequently identified problems, in both census rounds, were vagueness (in definition or instructions) and inconsistency between questionnaire and handbook or between questions.

Apart from the six 1980 censuses not specifying any minimum working time, three different formats were identified according to the degree of precision established in the questionnaire and/or the manual among the 10 censuses that set such criteria:

(*a*) The questionnaire did not make any reference to time, but the interviewer's manual defined the precise amount of time that was necessary in order for a person to be counted as a worker (Colombia, Costa Rica, Guatemala, Panama and Peru);

(*b*) The questionnaire stated vaguely "most of the period", and that formula was repeated in the manual with no further clarification (Chile, Ecuador and Paraguay);

(*c*) A definition with a time requirement was only vaguely stated in the manual (Brazil and Venezuela).

None of the three formats ensured that the time-requirement expression to interviewees would be consistent and precise. The first format is precise but, since it was not incorporated into the questionnaire, it was up to interviewers to improvise a phrase to comply with the instruction. The second format assured consistent presentation but, since it was only vaguely defined, was not effective because its interpretation could have varied from person to person. The third format is the worst, since it is vague and does not ensure consistency of presentation. Thus, the 1980 censuses did not improve over the 1970 censuses in this regard and are considered poor instruments.

An analysis of the 1970 censuses also revealed a lack of consistency between the question on activity status and the definition of the unpaid family worker with regard to the requirement of minimum time. Since in developing countries the proportion of economically active women in that category is usually higher than that of economically active men, problems arising from inconsistency in the measurement instruments affect women disproportionately. In the 1970s the majority of Latin American censuses, following the international recommendations, defined "unpaid family worker" as a person working at least 15 hours a week. The definition was, however, inconsistent, in most cases with either a shorter or a very vague time requirement for the "economically active", or even with a complete lack of it. (Details on countries are presented in table 3.) Since in census questionnaires the question on activity status comes before the question on employment status—acting in fact as a filter for the rest of the questions on economic characteristics—a problem arises when a person who is classified as active in the first question does not satisfy the time requirement to be classified as unpaid family worker in a following question.

Table 3 shows an improved situation in the 1980s: most censuses specified consistent time requirements for family workers and economically active people in general. The Uruguayan census was a special case, since the definitions for the economically active person in general and for the family worker in particular were inconsistent, but it provided instructions to solve the inconsistency problem.[15] Only four censuses required a longer time (15 hours a week, or one third of the normal working day) to classify a person as a family worker than to classify that same person as economically active (one day, one hour, any time, or no requirement at all. See tables 2 and 3).[16]

TABLE 3. CONSISTENCY OR INCONSISTENCY BETWEEN TIME REQUIREMENT FOR CLASSIFICATION AS ECONOMICALLY ACTIVE AND AS UNPAID FAMILY WORKER: LATIN AMERICAN CENSUSES OF THE 1970s AND 1980s[a]

Consistent	*Inconsistent*	*No time requirement for either definition*
	1970s	
Argentina	Chile	Brazil
Bolivia	Colombia	El Salvador
Costa Rica	Cuba	
Dominican Republic	Guatemala	
Ecuador	Haiti	
Nicaragua	Honduras	
Paraguay	Mexico	
	Panama	
	Peru	
	Uruguay	
	Venezuela	
	1980s	
Brazil[b]	Colombia	Argentina
Chile	Guatemala	Dominican Republic
Costa Rica	Panama	Haiti
Ecuador	Peru	Mexico[c]
Paraguay		
Uruguay[d]		
Venezuela		

[a]If the time requirement for classification as economically active is longer than or equal to the time requirement for classification as family worker, both definitions are considered consistent. If the time requirement for classification as economically active does not exist or is shorter than the time requirement for classification as family worker, the definitions are considered inconsistent. Information is based on both questionnaires and enumerator's handbooks. The 1981 Cuban census has not been listed, because the handbook was not available to the author.

[b]Since the reference period for activity status is 12 months and the time requirement for unpaid family worker is 15 hours per week, it is not known how in practice enumerators stated the question.

[c]The Mexico census questionnaire has an additional question on the number of hours worked for the employed in general and the unpaid family worker in particular under the topic of activity status.

[d]Uruguay is a very special case. There was no time requirement for classification as economically active, and the requirement for family workers was at least 15 hours a week—that is, both definitions were inconsistent. But there were clear instructions for enumerators to solve the inconsistency.

CONCLUSIONS

This analysis has shown improvements in the census instruments that gather information on women's labour-force participation from the 1970s to the 1980s. The changes were of two types: questions that specifically facilitated the identification of women workers, and technical modifications not geared to any specific sex. It is likely that changes of the first kind were the consequence, at least partially, of paragraph 2.190 in the United Nations recommendations for the 1980 population censuses on activity status. That paragraph highlights the particular problems that censuses face

in identifying economically active women and provides guidance for avoiding them. The recommendation was probably reinforced by activities of the United Nations Decade for Women for the improvement of statistics on women.

It seems obvious, from the analysis of the Latin American censuses of the 1980s, that efforts were made in the region to avoid the sexual stereotypes frequently present in censuses of the previous decade and to instruct enumerators to probe further whenever domestic roles were reported for women. Census instruments such as graphic illustrations suggested that women frequently played economic roles. What is not known is whether interviewers followed the instructions provided.

The 1980 census instruments were improved in the following ways:

(*a*) They all used a question rather than a heading or a title in the questionnaire;

(*b*) They all gave priority to economic activity among precoded alternative answers to the question on activity status, and most instructed the interviewers to stop at the first positive answer;

(*c*) More of them than in the 1970s emphasized the investigation of activity status, giving it more space in the questionnaire;

(*d*) There was closer agreement as to the minimum time requirement for two classifications: economically active and unpaid family worker.

While these changes affect women and men, they are likely to have a disproportionately larger influence on the data on women, because women more frequently work part-time or in occasional employment and they tend to be assumed more often to have non-economic roles.

As in the 1970s, the 1980 censuses varied in their specifications of the minimum amount of time a person had to work in order to be classified as a member of the labour force. The lack of a common standard makes it difficult to compare the measurements of labour-force participation in the countries of the region. Even worse, most 1980 censuses that included a minimum time requirement stated it vaguely and gave no clear instructions to interviewers about it.

In short, specific and general improvements were observed from the 1970s to the 1980s in the instruments used to measure female labour-force participation by Latin American population censuses.[17] But there is still a long way to go before population censuses become completely reliable sources of such information. For the 1990 censuses we can expect greater consciousness of the problems involved in identifying economically active women and ways to deal with those problems. Yet, census bureaux of the region will have to deal with new international recommendations—that is, recommendations and guidelines based on new definitions of the labour force (ILO, 1983 and United Nations, 1986). To put those new—and imprecise—definitions into reliable measurement instruments will not be easy, since there will be little experience of them. Developing countries will have to be assisted in conducting further research and encouraged to share experiences among themselves.

NOTES

[1] Some of the studies were initiated before the Decade (Durand, 1975), while others were probably influenced by the activities of the Decade (Baster, 1981; Dixon, 1982; Safilios-Rothschild, 1982; Zurayk, 1983; and Paiva, 1984). Many were directly sponsored or carried out by the United Nations (Recchini de Lattes and Wainerman, 1979; D'Souza, Robboni and Rohman, 1976; Wainerman and Recchini de Lattes, 1981; Anker, 1983; and United Nations, 1984b and 1985.

[2] Those analyses also provided quantitative estimates for various countries of the underestimation of female labour-force size as measured by censuses compared to alternative statistical sources.

[3] The two organizations have collaborated on the improvement of census statistics since the 1950s. For example, United Nations staff are listed among the participants at IASI meetings, and IASI representatives are listed as participants in meetings organized by the United Nations for discussion of, or in relation to, the preparation of the various census rounds (IASI, 1953 and 1958; United Nations, 1958b and 1961).

[4] The International Labour Organisation's new recommendations for measuring economic activity would affect the 1990 censuses, since the new ILO definitions were adopted by the United Nations (United Nations, 1986).

[5] For example, about the lack of clarity in the concept of work (Blacker, 1978 and 1980; Seltzer, 1978; Dixon, 1982; and Anker, 1983).

[6] The Statistical Office, which was in charge of drafting the recommendations for the 1980 censuses, also produced many documents relating to the quality of statistics on women (United Nations, 1976, 1980b, 1984a, 1984b, and 1985). Those documents contributing to discussions on the conceptual and technical problems of populations censuses adequately to register women workers, probably helped to prepare the way for the important changes introduced by the 13th International Conference of Labour Statisticians of ILO, in 1982 (ILO, 1983).

[7] This does not necessarily mean a general improvement in census results, since census quality depends on much more than just questionnaires and enumerator's handbooks.

[8] Obviously, more space does not necessarily mean better quality, although it generally does. The 1970 Brazilian census was the exception to the rule. The validity and reliability of its three questions to measure economic activity of women were judged very poor in a previous analysis (Wainerman and Recchini de Lattes, 1981, pp. 86-89).

[9] "Se neo trabalha, nem procura trabalho, qual a ocupacao ou situacao que tem e considera principal?" (If you are not working or looking for a job, what is your occupation or the activity that you consider principal?) This question was followed by a set of pre-coded alternatives, the first one of which was "homemaker". A second question asked about occupation in the previous 12 months. For more details see Wainerman and Recchini de Lattes (1981), pp. 86-89, or Recchini de Lattes and Wainerman (1986), p. 744.

[10] (*a*) Does occasional jobs; (*b*) Has been looking for a job during the past three months; (*c*) Was looking for a job before and is now waiting to be hired; and (*d*) It is impossible to find a job.

[11] "1. In which one of these situations were you *last week*? Working, looking for a job, etc. 2. Did you receive or are you going to receive payment in money for work you did at home or outside the home last week? (An enumeration of possible tasks followed.) 3. Last week did you work without receiving a payment in money, at your home or in a store, factory, workshop, agricultural enterprise etc. belonging to any member of your family? 4. Did you take any action during the past 30 days to find a job? 5. Did you work before, full- or part-time with payment in money? 6. How long have you been without a full- or part-time paid job? 7. How many hours did you work last week (or how many hours a week did you regularly work) in all your jobs (or how many hours did you regularly work in your last job or employment)?"

[12] The exceptional case of Brazil deserves a separate comment. The manual states that women who had worked any part of the previous 12 months should be classified as economically active even if they were not currently working because they had married and/or had given birth. This is part of a broader instruction intended to classify as economically active persons who work only part of the year. But this particular sentence can have mixed, if not only negative, consequences. The hidden assumption is that married women or those bearing

children do not work. The instruction would have helped to register more accurately those women who married or gave birth during the year. However, it is possible that it worked in a more subtle way, reinforcing the misconception that married women or women bearing children do not work, and thus inducing interviewers to skip the question for those women who appeared to be married and/or with children.

[13] Costa Rica, Ecuador, Guatemala, Haiti, Mexico, Panama and Venezuela.

[14] This proportion is lower than the one observed for the 1970 censuses, when 14 out of 20 censuses included a time requirement.

[15] The Uruguayan census followed the international recommendation of a minimum of 15 hours of work a week to classify a person as an unpaid family worker. But by not requiring any minimum time for the classification of economically active in general, it specifically instructed the interviewer to go back to the question on activity status in those cases where a person declared himself or herself an unpaid family worker and reported having worked less than 15 hours a week.

[16] The Brazilian census could be considered a fifth case. Consistency is difficult to establish, since the time requirement for the classification of economically active was "part of the time", with a reference period of 12 months, and the requirement for unpaid family worker was "at least 15 hours a week".

[17] These improvements do not necessarily mean that 1980 census results were better than those for previous censuses in a particular country. No country-by-country trend analysis was carried out, and, even if instruments to measure labour-force participation have improved, a more general evaluation of censuses than the one done here would be necessary before such a conclusion could be reached.

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NON-GOVERNMENTAL ORGANIZATIONS AND THE WORLD POPULATION PLAN OF ACTION

United Nations Secretariat*

SUMMARY

The World Population Plan of Action, which was adopted by the World Population Conference (Bucharest, 1974), is the main international instrument that provides guidance and serves as the standard reference in the field of population. Its provisions rest firmly on a global consensus, and its recommendations are addressed to Governments, international organizations, non-governmental organizations, scholars and the public in general. The Plan covers all the topics related to the dynamics of population (e.g., growth, fertility, mortality, migration, structure); the role and the status of women; the interrelationships between population, the environment and development; and makes particular reference to certain topics related to the promotion of knowledge and policy, such as data collection and analysis, research, management, training, dissemination of information, the role of national Governments and the international community, and the monitoring and review and appraisal of the Plan of Action. Many of the components of the Plan were part of the agenda of non-governmental organizations long before the Plan was adopted. Through their pioneering work, those organizations contributed significantly to the acceptance of the plan.

This article presents a summarized overview of the activities being undertaken by non-governmental organizations in the field of population as they relate to topics in the Plan of Action. It covers the activities of 81 organizations during the period 1984-1987.

INTRODUCTION

Since its creation, the United Nations has recognized the valuable contribution of non-governmental organizations in the area of social and economic development. Many of the issues that are receiving world-wide attention today and that are part of the international agenda had their origin in the pioneering work done by non-governmental organizations. This is the case, for example, of topics such as the role and the status of

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women, environmental degradation and the quality of life, infant and child survival, and many others. The area of population has not been an exception. The innovative role played by these organizations in the area of population paved the way for the involvement of national Governments and intergovernmental organizations. Their success in mobilizing financial, technical and human resources, conducting research, carrying out operational projects and, particularly, creating awareness by alerting Governments and the public in general have facilitated the current involvement of the United Nations.

The World Population Plan of Action, adopted by the World Population Conference in 1974 (United Nations, 1975), invited non-governmental organizations to collaborate in the implementation of the Plan and stated that the "success of this Plan of Action will largely depend on the actions taken by national Governments. To take action, Governments are urged to utilize fully the support of intergovernmental and non-governmental organizations" (para. 96). The active participation of non-governmental organizations and their contribution to a better understanding of and to the solution of population problems have been recognized by Governments and by the international community. In view of their independent and innovative approach, the International Conference on Population, held at Mexico City in 1984 (United Nations, 1984), not only recognized and applauded the efforts made by these organizations but stressed their involvement in the implementation of the Plan of Action and urged Governments "to encourage the innovative activities of non-governmental organizations and to draw upon their expertise, experience and resources in implementing national programmes" (recommendation 84). As a follow-up to the recommendations adopted at Mexico City, the Economic and Social Council requested the Secretary-General to submit to the Council, through the Population Commission, periodic reports on the work of those organizations in the implementation of the Plan of Action. This article is based on material prepared for the first and second reports that were submitted to the Population Commission in 1987 and 1989.[1]

The information used for preparing the two reports was collected by means of a questionnaire that was sent to more than 100 non-governmental organizations. The initial list of organizations included those that carry out activities related to the items of the Plan of Action and that have particular relevance to the mandates given to the United Nations, but it excluded many organizations that provide technical assistance or that carry out research and training activities and that are attached to governmental offices or to universities. The responses were supplemented by recent reports of activities of the organizations concerned and other documentation available to the Secretariat, such as annual reports, publications etc.[2]

This article consists of two major sections: one describes the organizations: the nature and coverage of their activities, their relationships with the United Nations system and the financial and human resources they devote to population activities. The second offers an overview of their major activities in regard to the implementation of the Plan of Action.

Major emphasis has been given to the substantive work accomplished by the organizations during the period 1984-1987. Annexes I, II and III summarize the information collected on the organizations for the period 1986-1987.

Characteristics of the organizations

Non-governmental organizations are set up through the voluntary association and decision of private individuals or groups to deal with a variety of issues. There are organizations that act at the local, national or international level but are different from political parties, although they may have political goals; that have religious interests but are different from churches; that are independent of Governments, but may receive important political and financial support from the public sector. While some may have powerful commercial interests (like the International Chamber of Commerce), others may comprise individuals and groups that are linked by a common humanitarian cause (like the International Planned Parenthood Federation or the League of Red Cross Societies), belong to a common profession or area of work (like the International Geographical Union) or share common religious interests (like Church World Service). Other organizations are more operational, their work being centred on research and analysis (like the Population Council), on the provision of technical and/or financial assistance (like the Ford, the Rockefeller or the William and Flora Hewlett Foundations) or on the dissemination of information (like the Population Reference Bureau). Some non-governmental organizations have developed particular skills in the area of awareness creation for public action and have opted for an independent advocacy role (e.g., the Population Crisis Committee). A recent development has been the consolidation of national and regional groups of parliamentarians interested in population and development issues under the aegis of the Global Committee of Parliamentarians on Population and Development. It is the variety of purposes, composition, membership, geographical coverage, and modalities of operation that characterize non-governmental organizations.

Composition and location

While some non-governmental organizations bring together local or national associations (like the International Planned Parenthood Federation), others bring together particular individuals, as in the case of the professional associations. In other instances, there are organizations that act as private entities and have their own staff to carry out research and/or technical assistance activities (like the Futures Group). Because of this variety of composition, it is common to find individuals who belong to various non-governmental organizations.

The large majority of non-governmental organizations that are included in this report have their headquarters in developed countries (see table 1). Nevertheless, many of them have regional offices or national

TABLE 1. GEOGRAPHICAL DISTRIBUTION OF NON-GOVERNMENTAL ORGANIZATIONS

Country	*Number of organizations*	*Percentage of total number*
Developed countries		
United States of America	46	56.8
United Kingdom	10	12.3
France	5	6.2
Switzerland	5	6.2
Other developed countries	9	11.1
SUBTOTAL	75	92.6
Developing countries	6	7.4
TOTAL	81	100.0

Source: Responses to a United Nations questionnaire prepared in 1988.

affiliates located in developing countries. It is important to take into account that there are many voluntary organizations located in the developing countries whose activities are essentially local. The focus here is on non-governmental organizations that have a global or regional character.

Nature

The majority of the non-governmental organizations included in this report are involved in more than one activity. The dissemination of information, communication and education was the most frequently reported activity (71 times), followed by research and analysis (57 times), the provision of technical assistance (45 times), the financial support of population activities (32 times) and professional association activities (17 times).

Relationships with the United Nations

In accordance with Article 71 of the Charter of the United Nations, the Economic and Social Council may consult non-governmental organizations that are concerned with matters within the Council's competence. The relationships between the United Nations and non-governmental organizations are governed by Council resolution 1296 (XLIV) of 23 May 1968, which refers to the conditions under which the organizations may be granted consultative status. The Council takes into account the membership, geographical spread, internal structure, elected leadership and the holding of annual meetings. The Council is assisted in these matters by its standing body, the Committee on Non-governmental Organizations, which examines the applications for consultative status, reviews periodically the activities of the organizations and makes recommendations to the Council.

Within the Secretariat, the Non-governmental Organizations Unit of the Department of International Economic and Social Affairs is the focal point for servicing the Committee on Non-governmental Organizations and is responsible for the administrative arrangements pertaining to the participation of the organizations in the various activities of the United Nations.

The Institutional Relations and Non-governmental Organizations Section of the Department of Public Information is in charge of the administrative arrangements related to the dissemination of information involving non-governmental organizations. In addition to the above-named units, there are two non-governmental liaison services, one at the United Nations Office at Geneva and the other at United Nations Headquarters in New York, that are financed by nine organizations of the United Nations system and that serve as inter-agency channels between the system and non-governmental organizations. Furthermore, most of the programmes, organs and specialized agencies of the United Nations system have established units or focal points to deal with the participation of non-governmental organizations in their programmes of work and maintain specialized rosters of the organizations that have activities related to their mandates.

Non-governmental organizations can be classified according to their level of involvement in the work of the Economic and Social Council: category I includes those that have a basic interest in most of the activities of the Council, are international in their activities and have broad geographical membership; category II embraces those that are concerned specifically with only a few areas of the work of the Council, including human rights. Those which can make occasional and useful contributions to the work of the Council may be placed on a roster for *ad hoc* consultations. In May 1989 there were 893 non-governmental organizations in consultative status with the Council; of those, 36 were in category I, 331 in category II, and 526 were placed on the roster. Of the 81 non-governmental organizations covered in this report, eight are in category I, 22 are in category II, 14 are on the roster and 37 do not have any consultative status. In the last group are some that have not applied for consultative status or that are "for profit" organizations, although their activities are very close to the principles and goals of the Plan of Action. Annex I presents the consultative status of the organizations *vis-à-vis* the Council.

Non-governmental organizations that have consultative status with the Council are invited to take part in many of the activities organized by the United Nations, such as intergovernmental meetings, technical seminars and workshops. In the field of population, they may participate in meetings sponsored by the United Nations, such as the 1974 and 1984 population conferences. In 1974, 109 non-governmental organizations participated as observers in the Bucharest Conference; 154 participated in the Mexico City Conference of 1984. In addition to participating in the sessions of the Council at which population matters are discussed, the organizations are invited to participate in the biennial sessions of the Population Commission and the annual sessions of the Governing Council of the United Nations Development Programme (UNDP) when it discusses the programme of the United Nations Population Fund (UNFPA). This participation is reciprocal in the sense that representatives of appropriate United Nations units may be invited to participate in activities of the non-governmental organizations. They may also be invited to act as the executing agencies of technical assistance projects and to carry out research studies requested by the

organizations of the United Nations system. For example, a number of projects financed by UNFPA are executed by non-governmental organizations: more than 10 per cent of the Fund's programme has been channelled through them, and the level in 1988 was around 14 per cent. This partnership between non-governmental organizations and UNFPA has been actively pursued, particularly in those countries where expertise is not available in the public sector or when private organizations in particular sectors enjoy a well-established reputation. Annex I presents more detailed information on the United Nations population activities in which non-governmental organizations participate.

Resources

The activities of non-governmental organizations are financed from a wide variety of sources, and may include membership fees, grants and contracts from government funds, grants, donations or contracts from private organizations (mainly foundations), endowment funds, sales of services and publications, or funds provided by the United Nations system. The organizations were invited to report their human and financial resources for the biennium 1986-1987. The data collected appear in annex II and include the total amount of financial resources of the organizations, the resources devoted to population activities (amount and proportion of the total financial resources as well as the number of professionals), and the origin of the resources (expressed as the proportion of their population budgets).

Although the information on the financial resources of non-governmental organizations refers to only half of them, it should be noted that those are the organizations that are most active in the field of population. The data shows that the reporting organizations devote 31 per cent of their resources to population activities and that they employ close to 1,300 professionals. The 10 largest organizations (those that devoted more than $10 million during the biennium under consideration) account for 79.3 per cent of the total amount of resources (see table 2).

The largest financial sources are Governments (66 per cent of all sources), followed by endowment funds (17 per cent), private grants (11 per cent), and United Nations system grants (4 per cent). It is important to note that some sources, particularly foundations, provide financial support to other non-governmental organizations and that the total amount of resources appearing in annex II does not correct for double counting; a preliminary attempt at correcting double counting (by subtracting the amount provided by the private sector as a source of financing) would give an estimate of $375 million per biennium. It is worth noting that the organizations are contributing to the population field a biennial amount of resources not much less than the figure reported for the United Nations system—$511.74 million for 1986-1987 (United Nations, 1989).

TABLE 2. FINANCIAL RESOURCES DEVOTED TO POPULATION ACTIVITIES OF THE 10 LARGEST NON-GOVERNMENTAL ORGANIZATIONS, 1986-1987

Organization	*Amount (millions of dollars)*	*Percentage of total*	*Principal source (percentage)*
International Planned Parenthood Federation (IPPF)	111.4	26.4	Governments (95)
The Population Council	42.4	10.1	Governments (52)
Family Planning International Assistance (FPIA)	41.7	9.9	Governments (95)
Ford Foundation	28.5	6.8	Endowment funds (100)
Pathfinder Fund	28.1	6.7	Governments (90)
The Rockefeller Foundation	20.8	4.9	Endowment funds (100)
Family Health International (FHI)	20.0	4.7	Governments (97)
The Futures Group	18.0	4.3	Governments (98)
The Hewlett Foundation	12.1	2.9	Endowment funds (100)
Population Resource Center International	11.0	2.6	Governments (60)
Subtotal	334.1	79.3	
Other organizations	87.4	20.7	
TOTAL	421.5	100.0	

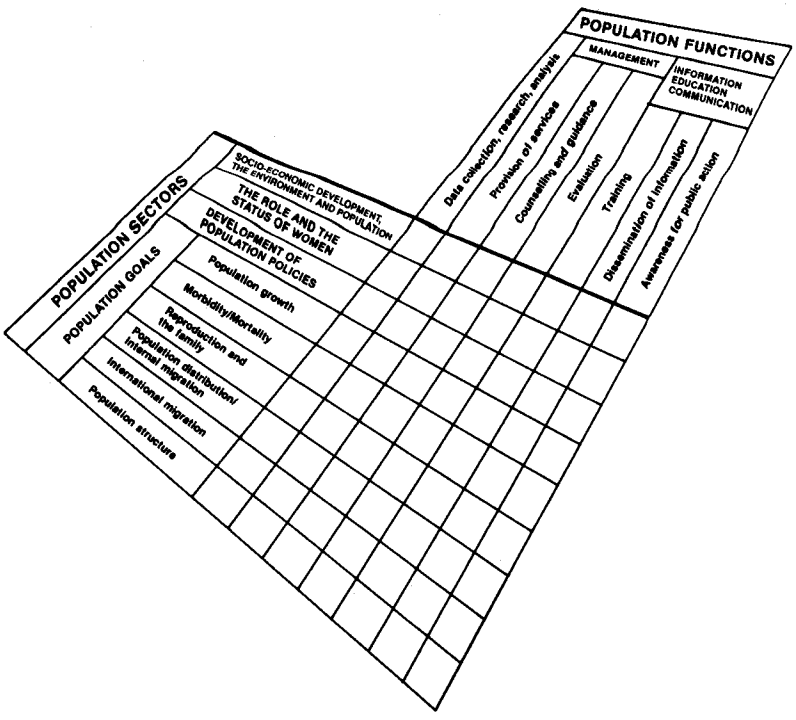
Source: Responses to a United Nations questionnaire prepared in 1988.

POPULATION ACTIVITIES

As mentioned above, all of the non-governmental organizations were selected on the basis of the relationship of their activities to the subjects covered in the World Population Plan of Action. Those activities are numerous, and only a small number of them are reported in this section. The organizations were invited to provide examples of their work in relation to each of the topics covered by the World Population Plan of Action and to indicate the proportion of their resources being devoted to each of the topics; the latter information appears in annex III.

The framework for the classification of activities is taken from the World Population Plan of Action and the recommendations for the Plan's further implementation made by the Mexico City Conference. The first four topics of the recommendations for action adopted at the Mexico City Conference refer to the substantive components of the Plan (i.e., socio-economic development, the environment and population; the role and status of women; development of population policies; and population goals and policies); it was decided to group them under the label "population sectors". The fifth topic of the Mexico City Conference recommendations deals with the promotion of knowledge and policy and includes data collection and analysis, research, management, training, information, education and communication; for the presentation of the activities of the organizations, it was decided to label them as "functions in the field of population". The clustering of the topics of the Plan into those two broad groups takes into account that their components can be grouped along those two distinct dimensions (see fig. I); in fact, each one of the "functions" could

Figure I. The population matrix: activities contemplated in the World Population Plan of Action



refer specifically to any of the "population sectors" (e.g., research on internal migration or dissemination of information on mortality risks). It should be noted that the information was provided by the organizations themselves and that the figures appearing in annex III should be taken as an indication of the magnitude of their efforts rather than an exact account of the financial resources allocated to their population activities.[3]

Socio-economic development, the environment and population

The World Population Plan of Action contains various recommendations related to the interrelationships between population, resources, the environment and the process of social and economic development. A large number of non-governmental organizations signaled the importance of taking into account these interconnections long before the Plan was adopted in 1974. While some organizations provide financial support in this area, others promote and co-ordinate research activities and a third group undertakes studies and disseminates research results.

Among the major donor organizations, Oxfam, for example, sponsors research on the interrelationships between the environment, resources and population and supports programmes aimed at preventing environmental

degradation. The Ford Foundation is financing various projects on rural poverty and resources that are linked to environmental and demographic variables. The William and Flora Hewlett Foundation has identified population and the environment as two of its six main programmes; special emphasis is given to policy-oriented studies, decision-making processes and training in environmental issues. Finally, the Rockefeller Foundation co-finances the International Institute for Environment and Development (IIED) and supports a network of Latin American conservation centres.

In the area of promotion and co-ordination of research activities, the Committee for International Co-operation in National Research in Demography (CICRED) initiated in 1980 a research programme on the inclusion of population variables in socio-economic planning. Fifty-two projects are being carried out or will shortly be initiated in 32 national demographic research centres and seven international organizations. The International Union for the Conservation of Nature and Natural Resources (IUCN) is preparing an updated version of the World Conservation Strategy which will have a chapter on population. IUCN is also undertaking a project on the environmental status of the Sahel which includes population as a major dimension, and it published a report on population and sustainable development in 1987. The International Union for the Scientific Study of Population (IUSSP) has established two committees in this area: the first is the Working Group on Micro-approaches to Demographic Research, which has been working on strategies to assess the demographic impact of selected demographic programmes, and the second is the Committee on Economic Consequences of Alternative Demographic Patterns, which organized a seminar on the consequences of population trends in Africa (Nairobi, December 1986), and a meeting on the family, the market and the State in aging societies (Sendai, Japan, September 1988). IUSSP is planning to initiate an activity on the interrelationship of demographic change and the labour force, employment and unemployment. The Programme of Population Activities in Latin America (PROLAP) convened a seminar on population, the environment and development which centred on the discussion of 34 research papers (Quito, 1987).

In the area of social research, the International Institute for Applied Systems Analysis (IIASA) has undertaken two major activities. The first is an environment programme that intends to assess the causes and consequences of problems related to acid deposition, the impact of climate on agriculture, water resources systems and the sustainable development of the biosphere (Europe was selected as a case study). One of the goals is the elaboration of policy analyses of the institutional, technological, and research and monitoring strategies for improving the interaction between development and the environment. The second activity deals with research on national and regional food and agricultural systems and their interaction on the international market, involving institutions in 21 countries that account for 80 per cent of the world population. The Population Council has been conducting a study on the demographic dimensions of the international distribution of resources and a comprehensive review of population and development issues and institutional capacities in sub-Saharan Africa.

The Council collaborated in the substantive preparation of a conference on population and rural development that was organized jointly by the Food and Agriculture Organization of the United Nations (FAO) and UNFPA (Rome, June 1987) and contributed a study on the demographic and economic consequences of land reform in East Asia. During the past decade the Research Triangle Institute (RTI) has been undertaking the Integrated Population and Development Planning (INPLANT) project, which provides assistance to over 40 developing countries in the area of population and development planning. RTI collaborates with The Futures Group in the implementation of its Resources for Awareness of Population Impacts on Development III (RAPID III) and has developed HOST, a microcomputer software application shell for projection modelling. The Worldwatch Institute initiated a project in 1984 to monitor changes in the global resource base, in order to assess progress in achieving a sustainable society; its annual report, entitled *State of the World*, presents these results.

Finally, in the area of public awareness, the Futures Group initiated a new version of its RAPID III project which uses computer projections to illustrate the relationships between population and development for policy-makers. The Global Committee of Parliamentarians on Population and Development has been sponsoring global and regional meetings aimed at encouraging a more active participation of legislators in debating population and development issues. IIED has clearing-house services in this area through its Earthscan programmes, and in 1987 it initiated the annual publication of the *World Resources* report in collaboration with the World Resources Institute. The International Planned Parenthood Federation (IPPF) includes a section entitled "Earthwatch" in its journal *People*. The Population Reference Bureau, in addition to its clearing-house services, is completing its contribution to the RAPID III project of the Futures Group. The National Audubon Society and the Sierra Club undertake activities meant also to create awareness of environmental and population issues.

The role and the status of women

The work of non-governmental organizations in this field is extremely varied. It is important to note that there are many population activities that are related to the improvement of the condition of women but that are not reported as such. This is the case, for example, with regard to organizations that collect data, conduct research and disseminate their results by gender or that have adopted an equal opportunity employment and affirmative action policy in favour of women as part of their internal procedures. The Rockefeller Foundation, for example, established a Task Force on Women's Programming and asks applying organizations to provide data on the gender and minority composition of their leadership.

Some organizations bring together national women's associations and play an advocacy role on women's issues—for example, the Associated Country Women of the World, the International Alliance of Women, and the World Union of Catholic Women's Organizations. Others provide

technical and/or financial support—for example, the Ford Foundation, which emphasizes women's economic opportunities, education and health as one of its four major lines of work. Others deal with training and managerial issues. For example, the Centre for Development and Population Activities (CEDPA) provides technical assistance and training facilities for training women managers in the area of population. The International Council on Management of Population Programmes (ICOMP) gives particular support to management development involving women. The Pan-African Institute for Development has a training programme for women that aims at integrating women's issues into development programmes and includes such topics as promotion of income-generating activities and management of programmes. The Save the Children Federation emphasizes the participation of women in local community health planning. Numerous organizations that work in the area of family planning express a particular interest in improving the status of women and stress the need to incorporate women into the planning and implementation of family-planning programmes. Such organizations include Family Health International (FHI), the International Federation for Family Life Promotion (IFFLP), IPPF, Oxfam, the Pathfinder Fund, the Programme for Appropriate Technology in Health (PATH) and the World Federation for Voluntary Surgical Contraception (WFVSC).

Among the numerous research studies on the role and status of women being undertaken by non-governmental organizations, the Health and Population Center of Battelle Memorial Institute, for example, is involved in a large project that examines the changing role of women in the United States during this century. The International Sociological Association has a research committee on women and society. The Population Council concluded a project on indicators of women's status in developing countries. It covered the period 1970-1980, and the final report, which assembled and analysed a large array of statistics and indices of socio-economic development, highlighted the impact of paid employment (as one of the best indicators of women's status) upon fertility. The Council also completed a study on women's status and fertility in developing countries in relation to the preference for male children and economic security. The Population Research Center of the Rand Corporation concluded a comparative study on the social and economic mobility of women in three Asian countries, using data from the Asian Marriage Survey. The project identified aggregate patterns in the levels and distribution of women's schooling, age at marriage, fertility and labour-force participation among families, and explored the parents' propensity to invest in daughters relative to sons and intergenerational changes in women's status. RTI, assisted by the International Center for Research on Women, is implementing a project entitled Gender Resource Awareness in National Development, which works with developing country professionals and uses microcomputer-based models to show the benefit to overall national development of integrating women and girls more fully into national economic development efforts. The Rockefeller Foundation is financing a series of projects dealing with continuing trends in women's employment

and family responsibilities, differences in the allocation of income and time between men and women within the household and the implications of such differences for the social welfare of the family and children, and the psychological dimensions of gender roles and changing patterns of socialization.

In the area of operational projects there are numerous activities: IPPF, for example, is developing new programmes and services aimed at involving men in family planning and in increasing male support for their partner's use of contraception. Numerous projects address the involvement of women in the health sector: the Japanese Organization for International Co-operation in Family Planning (JOICFP), for example, is organizing annual workshops on the enhancement of women's role in community health in the Latin America and Caribbean region. Many organizations foster income-generating activities aimed at improving women's status; Soroptimist International, for example, is involved in projects aimed at training and employing women, particularly in non-traditional and highly productive occupations.

Development of population policies

Since the ultimate responsibility for population policies rests with each Government, the work of non-governmental organizations in relation to population policies is mainly advisory and advocatory. The Ford and the Rockefeller Foundations have been encouraging the adoption of strong population policies for more than 25 years, and one of their major lines of work includes support for policy research—recent examples include the policy research sponsored by the Ford Foundation in Togo and the Rockefeller Foundation's assistance to the Government of Thailand. The Population Council has also been very active and has provided technical support to various developing countries. One example is the assistance being provided to the Government of Bangladesh for the development of a population unit within the Planning Commission. The World Population Society is providing technical assistance to developing countries to draft national population policies through its project National Applications of Recommendations for the Implementation of the World Population Plan of Action (NAPRO). IUSSP completed a large-scale comparative project on the uses of social science research for population-policy design in five developing countries. Its Committee on the Utilization of Demographic Knowledge in Policy Formulation and Planning is analysing a number of country experiences, and its Committee on Population and Policy co-organized with the United Nations an expert group meeting on international transmission of population policy experience (June 1988). IUSSP organized a seminar on the relevance of international experiences for the sub-Saharan region (Kinshasa, Zaire, early 1989). PRB has been involved in the creation of population-policy data bases and in the development of national population policies (e.g., its OPTIONS project). Finally, a number of organizations are active in the creation of awareness among policy-makers and high governmental officials. Among the numerous activities

are the RAPID III and Options for Population Policy projects of the Futures Group and RTI and the activities for public advocacy of many organizations, such as the General Services Foundation, the Population Crisis Committee and the Population Institute.

Population goals and policies

Population growth

The work of non-governmental organizations in the area of population growth is usually merged with other subjects, such as population and development or population policies, or it is mentioned in relation to the components of population growth. Nevertheless, a few specific examples of work on growth as such can be mentioned. The Population Council produced a study on the demographic impact of alternative fertility schedules and concluded that the delay of first births (e.g., to age 25-27 years) and an increased spacing between births (e.g., from four to six years) would reduce drastically population growth rates. The Population Institute issued a report that estimates the number of couples in 12 countries for whom family-planning services need to be provided in order to achieve national fertility goals conducive to achieving the countries' population-growth targets; the study also presents the level of resources needed. Other organizations, such as Zero Population Growth, are involved in promoting the concept of population stabilization through political action and public education.

Morbidity and mortality

The work of non-governmental organizations in this area includes the servicing of affiliates (e.g., International Confederation of Midwives), the provision of funds, action-oriented activities, research and the dissemination of information. Among the donor organizations, The Pathfinder Fund and the Ford and Rockefeller Foundations contributed to the preparation of the International Safe Motherhood Conference (Nairobi, 1987). The Ford Foundation has been providing support to activities related to high-risk mothers and child survival. The Rockefeller Foundation has a large health sciences programme consisting of three main components: the great neglected diseases of mankind (e.g., malaria, schistosomiasis, hookworm and diarrhoea); the health of populations, which fosters research and training in clinical epidemiology; and biological and health information. The Foundation collaborated with the World Health Organizaton (WHO) in the launching of the "safe motherhood initiative"; support is also provided to WHO to improve the delivery of vaccines to developing countries.

Many organizations are involved in the direct provision of health services—for example, the Child Survival Programme, launched by the Save the Children Federation, which covers 23 developing countries, and the projects and programmes of Church World Service and the Interna-

tional Federation on Ageing. Other organizations focus their activities on the training of local health personnel, as in the case of the American Public Health Association (CEDPA) or the Pan-African Institute for Development.

In relation to research activities, CICRED has organized several inter-centre studies. One was on infant and child mortality in the third world, with the participation of 27 research studies; the second, which is under way, is on socio-economic differential mortality in industrialized countries; the third, on the effects of social organization on the decline of mortality in developing countries, is in preparation. IIASA has produced various studies under the general topic of health-care research, which aims at developing a family of submodels of national health-care systems for the use of health-care planners, and includes submodels related to population, disease prevalence, and the need for, and allocation and supply of, resources. IUSSP has a Working Group on Micro-approaches to Demographic Research, which includes in its programme of work the assessment of health and nutrition interventions; its Committee on Comparative Mortality Changes has organized seminars on new approaches to measurement and analysis, on mortality and society in sub-Saharan Africa and on mortality transition in South-East and East Asia. IUSSP and WHO are preparing a workshop dealing with the social mechanisms of the transmission of acquired immunodeficiency syndrome (AIDS). The Population Council and RTI, among numerous other research organizations, are studying the demographic implications of the AIDS epidemic. In the area of dissemination of information and creation of awareness, GCPPD, for example, organized three regional meetings with parliamentarians on child survival (other meetings are being planned), and Soroptimist International is setting up study groups on AIDS throughout its local clubs. Finally, numerous organizations are increasingly disseminating materials on AIDS—for example, starting in 1988, IPPF has been publishing *AIDS Watch* as a regular supplement to its journal *People*.

Reproduction and the family

Among the private donors, the Ford Foundation concentrates on the support of activities related to the demand for family-planning programmes; it also provides significant support to other organizations that deal with teen-age pregnancies. The William and Flora Hewlett Foundation has a broad programme that includes financial assistance for the training of experts, policy-oriented research, programme evaluation and implementation of policies, including family-planning programmes; special attention is given to adolescents. JOICFP is sponsoring projects in 23 developing countries that integrate family planning, nutrition and parasite control programmes. The Rockefeller Foundation is providing assistance in two broad areas: research in reproductive biology, including the development and evaluation of new contraceptives, and activities related to better

policies and progammes in developing countries (training, research and exchange of experiences).

Among the numerous illustrations of work done in the area of family-planning services, FHI has established a large international network for contraceptive evaluation and launched the study of long-term consequences of contraceptive use; it supports in more than 40 countries contraceptive evaluation, maternal health-care monitoring programmes and pregnancy surveillance studies, and provides training in those areas. Family Planning International Assistance (FPIA) was providing financial support in 1987 to 130 projects in 38 countries, where approximately 1.5 million contraceptive clients were served and 4.8 million couple-years of protection were provided. FPIA is encouraging grantee organizations to generate income through their programmes, and 36 projects included such a component.

IPPF is the leading non-governmental organization in the provision of family-planning services. More than 100 independent affiliates carry out activities in 123 countries and provide family-planning services through clinics, mobile units and community-based distribution networks; they also provide training, public information, formal and non-formal education in population, sex education and marriage counselling; carry out research; and are involved in political action aimed at creating awareness and at the modification of national legislation. Through its affiliates, IPPF encourages the utilization of family-planning services to respond to the spread of AIDS. IPPF plans to integrate into its programme of work further activities related to child survival and women's educational status and, through both advocacy and programme initiatives, it seeks to project a "pro-family" image that reflects a positive, humanistic and non-restrictive perspective on the family. IPPF plans to intensify its work in certain key areas, such as adolescent fertility, operations research, male involvement in family planning and the improvement and expansion of services for better family health.

The Pathfinder Fund is expanding its assistance to innovative family-planning programmes (currently in 28 developing countries). Some programmes are combining the delivery of family planning with the provision of basic primary-health-care services. The Population Crisis Committee (PCC) provides grants for family-planning programmes in developing countries.

In the area of new contraceptives, the Programme for the Introduction and Adaptation of Contraceptive Technology (PIACT), which is a component of PATH, deals with technology transfer and issues related to the local production of contraceptives through more than 100 family-planning and primary-health-care projects in 30 developing countries. Other organizations involved in the introduction of new technologies include Family Health International (FHI), the Population Council, PCC and WFVSC. Some organizations, such as PCC, the Futures Group, PATH and Population Services International (PSI) provide assistance in the area of social marketing.

Finally, among the organizations that focus their activities on the promotion of and assistance to natural family-planning procedures, IFFLP brings together member associations in 95 countries, which are involved in research, the dissemination of information, training and the delivery of natural family-planning methods. It provides technical and financial assistance to its affiliates. In 1986 IFFLP organized its Fourth International Scientific Congress and General Assembly with the participation of 550 people from nearly 88 countries. Other organizations that play an advocacy role in this area include the International Right to Life Federation and the World Organization/Ovulation Method/Billings (WOOMB).

Owing to increased interest in the effectiveness and efficiency of family-planning programmes, managerial concerns have emerged as a major area of work. ICOMP, for example, provides assistance at the country and programme levels, and, through its Institutional Development Assistance Project (IDAP), it seeks to provide needed management assistance through 22 management and public-administration institutes. It organizes regional training workshops and conferences and implements projects in developing countries on behalf of bilateral and multilateral donor organizations. Management Sciences for Health provides technical assistance in management to health organizations, family-planning programmes, community organizations and international agencies; it offers training locally and abroad for family-planning officers and professionals, using existing regional management and training institutions. The Population Council participates in the design, management and evaluation of family-planning programmes in various developing countries. Other organizations that work in this area include CEDPA and the Pathfinder Fund.

Two major areas of research on reproduction and the family can be identified in the programmes of the non-governmental organizations. The first area is biomedical research, and includes, for example, FHI's assistance to reproductive-health research centres in eight countries and the evaluation of new contraceptive techniques through an international network of 50 countries. The International Committee for Contraception Research of the Population Council and its Center for Biomedical Research continue to study subdermal implants (of which NORPLANT has been approved for distribution in nine countries), contraceptive rings, a progestin-releasing intra-uterine device and anti-fertility vaccines. The Council also developed an advanced intra-uterine device, Copper T 380A.

The second area is social research. The Alan Guttmacher Institute (AGI) completed a comparative analysis of factors related to teen-age pregnancy in 37 developed countries. (A study of family formation by adolescents in three South American Countries has been recently concluded.) AGI also published *Induced Abortion: A World Review, 1986*, which contains the most current information available on laws and policies regarding abortion. CICRED is organizing a new study on the utilization of family-planning records for the analysis of population dynamics in developing countries. The Futures Group completed a review of the literature on quantitative approaches used to analyse the socio-economic deter-

minants of fertility in developing countries; the review includes statistical models on the interrelations between fertility and socio-economic development, child labour patterns and legislation, old-age security, infant and child mortality, nuptiality, female employment, educational attainment, income distribution, and urbanization and rural-to-urban migration. The Health and Population Research Center of Batelle Memorial Institute has been examining the social and cultural factors underlying teen-age fertility. IIASA is carrying out research on the association between fertility levels and the degree of "concentration of child-bearing" (that is, the extent to which child-bearing is unequally distributed within the population of women of child-bearing age).

The World Fertility Survey, the largest social survey ever undertaken, was carried out by the International Statistical Institute (ISI) with the collaboration of the United Nations and in co-operation with IUSSP. The Survey lasted 12 years and covered 42 developing and 20 developed countries. ISI provided technical expertise to participating countries in so far as one of the principal objectives of the survey was the building of national capacities to describe and interpret fertility behaviour. The Institute for Resource Development (IRD) of Westinghouse Electric Corporation initiated the Demographic and Health Surveys Program (DHS), which succeeded the World Fertility Survey, and the Contraceptive Prevalence Surveys (also carried out by IRD). During 1984-1989, DHS provided assistance for the implementation of 35 surveys and 25 in-depth analyses on specific topics in developing countries. IUSSP organized meetings on birth-spacing programmes and on fertility and mortality changes as assessed through micro studies, and its Committee on Comparative Analysis of Fertility and Family Planning has concentrated on the biomedical and demographic determinants of human reproduction, family-planning management techniques and the fertility transition in Asia and Latin America. The Population Council continues its programme of research awards on the determinants of fertility in developing countries; research continues on the consequences of and policy responses to below-replacement fertility in developed countries, target-setting for family-planning programmes, and the determinants and demographic impact of sterilization in developing countries (now completed). The Council is undertaking 25 "further analyses" and a small number of "in-depth" surveys for DHS; the results will be used for its programme on the determinants of fertility behaviour. The Council completed a study on rural organization and local administration in an East African country that underlined the role of cultural and institutional factors as determinants of high fertility in spite of important anti-natalist efforts. PRB published three in-depth reports on nuptiality patterns in developing countries, adolescent fertility, and knowledge and use of contraception in developing countries. The Population Research Center of the Rand Corporation has been conducting research on the contraceptive role of breast-feeding, and completed a study on family planning and contraceptive use in Malaysia that analyses changes in contraceptive behaviour using a multi-state hazard model.

The level of involvement of non-governmental organizations in this sector varies. At the national and local levels, there are many voluntary organizations that work in social research and the design of programmes (e.g., rural development) or for the provision of assistance to migrants in rural development. At the international level, however, the interest of non-governmental organizations is rather limited, compared with their involvement in other population sectors.

CICRED is preparing a new inter-centre project on population distribution and urbanization that will include both developed and developing countries; as an initial step, meetings have been convened with the participation of interested scholars to discuss conceptual and methodological issues. The Commission on Population Geography of the International Geographic Union has selected population distribution as one of its areas of attention; it co-ordinated the participation of research centres in the analysis of trends, causal factors and government policies through four regional symposia. The Commission launched a study on population distribution in Africa, co-sponsored the International Conference on Population Mapping (Calcutta, India, 1985) and organized a symposium in 1987 on the development and redistribution of the labour force in agrarian regions of European socialist and capitalist countries. IIASA carried out the largest study of internal migration ever undertaken. It emphasized the consequences for the growth and decline of areas within the countries analysed (Canada, the United States and 15 European countries); the 26 scholars involved received training in methods and the use of computer programs for multiregional demographic analysis from the Institute. Each case study included analyses of regional birth, death and migration rates; assessments of the present situation and of projected scenarios for the year 2000; and summaries of national population policies.

IUSSP has a Committee on Internal Migration, which organized a seminar on migration and regional development, concentrating on methodological problems, assessments of substantive results of the research conducted, and policy conclusions derived from those studies. The Working Group on Micro-approaches to Demographic Research has also devoted some attention to migration and urbanization topics. The Union plans to convene a seminar on organization and its economic and social consequences. The Rand Corporation has developed methodologies for the analysis of migratory history data, the interrelationships between migration and fertility, and the effects of decentralization of economic activities on community distances. The Center has carried out research in various developing countries—Guatemala and Malaysia being recent examples—and concluded a study, which uses longitudinal microdata, on the dissimilarities between return and onward movers. RTI has incorporated the above-mentioned methodology produced by IIASA into its large-scale project, Integrated Population and Development Planning (INPLAN), and developed the Integrated Multi-regional Demographic Analysis Package,

which is a microcomputer-based package that can make demographic estimations for up to 11 sub-national regions simultaneously.

International migration

The activities of non-governmental organizations include the provision of direct assistance to migrants and refugees, research, dissemination of information and advocacy of human rights. Among those involved in social research, CICRED, for example, is working on two inter-centre projects on the impact of international migration in selected countries (both developed and developing). The Ford Foundation has defined international migration and refugees as one of its four major clusters of activity. Its activities include support for the protection of the legal rights of migrants and refugees, the planning and management of refugee relief and development operations, substantive research on the causes and consequences of world-wide population movements, and support to resettlement programmes for migrants and refugees in new locations. The Foundation is assisting the Office of the United Nations High Commissioner for Refugees (UNHCR) with training programmes on the management of refugee emergency situations.

IUSSP has a Committee on the Economic and Social Aspects of International Migration, which has concentrated on a review of theories of the determinants of international migration, the socio-economic processes that are concomitant with international flows, migrants' decision-making processes and the determinants and consequences of international migration. Recently, the Union organized a workshop on international migration data and two others on international migration systems and networks. The Population Council was involved in projects related to refugee movements and international legal and illegal migration from developing countries, and participated in the organization of a series of seminars on immigration and United States foreign policy. PRB prepared a report on Asian and Hispanic immigration to the United States since 1965 and its social, economic and political implications. The Population Resource Center (PRC) organizes briefings and policy discussions on population issues for policy-makers, and one of the topics most widely discussed is international migration. The Rockefeller Foundation established, in 1982, a research programme that provides support for studies on the causes and effects of current immigration to the United States, including refugee immigration. The studies cover refugee resettlement, the impact of immigrants and refugees on the labour market, social and economic conflicts between new immigrants and minority groups, and policy and other factors likely to influence immigration levels.

Population structure

The work of non-governmental organizations in population structure is usually a component of larger activities dealing with population and development issues or social-welfare concerns. The organizations working

in this sector conduct research, group professionals or associations that operate with particular demographic subgroups (e.g., the International Association of Gerontology), or provide assistance to specific segments of the population (e.g., Church World Service, Opera Pia International, or the Save the Children Federation).

In the area of social research, for example, the Batelle Memorial Institute has decided to support studies on the impact of population aging on the distribution of public-sector resources among the younger and older generations. CICRED is co-ordinating an inter-centre study on the demographic and socio-economic aspects of population aging; it includes the preparation of 20 monographs. IIASA's population work, which has been focusing on aging, includes research on the socio-economic and health implications of aging populations and changing life-styles in industrialized countries; related activities encompass the development of models, the assessment of the relative contributions of mortality and fertility changes to the aging process, the study of the relationships between aging and rapid technological change, the socio-economic implications of those issues—effects on wage costs, overall productivity and competitiveness under tight market conditions—and the assessment of possible measures to make pension schemes less a burden on younger generations.

The Committee on Social and Economic Consequences of Alternative Population Patterns of IUSSP has been discussing issues related to youth and the aged. Opera Pia International has studied the active contributions of aged people in three developing countries: the findings have served to orient action programmes. It plans to initiate a project on the scientific, social and ethical aspect of aging. RTI is involved in research and assistance activities related to changing population structures, the needs of the elderly and the improvement of their population.

Promotion of knowledge and policies

Data collection, research and analysis

Three organizations are particularly involved in promoting national self-reliance in data collection: the Inter-American Statistical Institute promotes population censuses and household surveys, and works in close collaboration with the Latin American Demographic Centre (CELADE) of the Economic Commission for Latin America and the Caribbean; the International Institute for Vital Registration and Statistics fosters the improvement of civil registration and vital statistics in developing countries; and ISI provides technical assistance for improving national survey capabilities and, through its programme Dynamic Data Base (DDB), provides access to more than 250 data sets from national surveys, including data from the World Fertility Survey. IRD is preparing a project called Demographic Data for Development, the purpose of which is to build up and maintain a data base on population and related socio-economic variables. The project includes the provision of microcomputers and technical assistance for pro-

cessing and analysing population, family-planning and health data in developing countries.

In addition to the numerous examples of social research implemented by the organizations that have been discussed above, mention should be made of the promotion and exchange of scientific knowledge among scholars as a particular function. CICRED brings together various affiliated research centres around the world and co-ordinates inter-centre research studies. In the 1970s, it assisted national population research centres in the preparation of 56 national population monographs. It prepares a directory of demographic research centres, listing more than 300 governmental, university and other research institutions around the world (the third edition has recently been completed) and is preparing a project aimed at assessing the current state of population-research capacity. IUSSP, the leading international professional association for individuals in the field of population (at the end of 1988 it had 1,775 members from 124 different countries of residence), promotes research, disseminates results and fosters the exchange of knowledge among scholars through its research committees, seminars and workshops. For the Latin American Council for the Social Sciences (Consejo Latinoamericano de Ciencias Sociales, CLACSO), PROLAP is the group that specializes in population for Latin American academic centres involved in population research. It organizes seminars and working groups and has established three areas of co-ordination: communication and documentation, training, and research.

Management (provision of services, counselling and guidance, and evaluation)

In so far as population activities are relatively new compared to other areas of social and economic development, it has been necessary to devise means to improve their efficiency and efficacy by means of sound administrative practices based on modern management techniques. Many of the non-governmental organizations mentioned above are involved in the provision of services that may include assistance to women (e.g., General Service Foundation), the distribution of low-cost techniques for child survival (e.g., the Save the Children Federation), the delivery of family-planning methods (e.g., Population Services International), or assisting migrants, refugees or the elderly (e.g., International Federation on Ageing). Other organizations provide counselling and guidance, which may include activities directed to particular population groups (e.g., World Assembly of Youth or the World Association of Girl Guides and Girl Scouts) or to other organizations, as is the case in the preparation of research guidelines (e.g., CICRED's criteria for collecting data or conducting research, or IPPF's guidelines for the delivery of family-planning services). Still other organizations have developed a particular expertise in the area of management, and their work may include research, training of managers, advisory services and exchange of information. (The work of CEDPA, ICOMP and Management Sciences for Health was mentioned above.)

An area that has received important support from the organizations is evaluation. Donor organizations have increasingly tended to call for the

inclusion of monitoring and evaluation of activities they support. A number of organizations have specialized in the evaluation of services and provide assistance in it (e.g., FHI, FPIA, JOICFP, ICOMP, Management Sciences for Health, University Research Corporation, and IRD).

Information, communication and education

Training has been considered one of the priorities of assistance in the field of population, and many organizations include training as a component of their programmes. In addition to the examples presented above, mention should be made of the work of some of the organizations that have concentrated in this particular area. CEDPA, for example, is involved in the training of managers for family-planning, health and development programmes. It has trained more than 2,700 managers, most of them women, from nearly 100 countries. The International Institute of Rural Reconstruction (IIRR) includes population topics in the training of rural leaders, administrators and supervisors in rural development programmes at the grass-roots level. PROLAP and the Latin American Demographic Centre (CELADE) organized a seminar on the teaching of population (San José, Costa Rica, 1986). World Education focuses on non-formal education in various areas, including population.

Virtually all non-governmental organizations have activities aimed at disseminating information on population issues, and some examples have been provided above. Some organizations have concentrated their efforts in this area; among them, the Association for Population/Family Planning Libraries and Information (APLIC) maintains a network that includes more than 80 organizations world-wide; it offers orientation and consultative services for documentalists, librarians and information specialists, and its Duplicate Book Programme (DBP) serves libraries in developing countries free of charge. CICRED maintains and manages the *POPIN Thesaurus: Population Multilingual Thesaurus* within the framework of the Population Information Network (POPIN), which was established by the United Nations, and has published two editions, in English, French and Spanish (the first in 1979 and the second in 1985); the third edition is now in preparation. Since 1976, CICRED has published quarterly, in English and in French, the *Review of Population Reviews*, which contains summaries of demographic articles appearing in about 85 journals specializing in population (1,400 summaries a year). A project to computerize this information is being discussed, also within the framework of POPIN. PRB has concentrated its work in gathering, interpreting and disseminating population information for the public in general and for leaders and policy-makers in particular.

Some organizations have specialized in the area of creating awareness of population issues; among them, the Center for Population Communications International has been promoting the production and use of soap operas in developing countries as a medium for conveying family-planning and health messages; the Center disseminates information to the news media of the world and to other non-governmental organizations. Popula-

tion Communication develops television and motion-picture screenplays that include family planning and other population topics, and disseminates information on contraception to physicians in developing countries. It also monitors the views of international leaders on population stabilization. Some organizations have concentrated on creating awareness and advocacy for public action. In addition to the meetings of parliamentarians mentioned, GCPPD organized the Global Forum of Spiritual and Parliamentary Leaders on Human Survival (Oxford, United Kingdom, April 1988). PCC, the Population Institute and the PRC work closely with policy-makers, journalists and other influential groups on population issues.

NOTES

[1] The two reports provided information on the activities being undertaken not only by non-governmental organizations but also by a small number of intergovernmental organizations. The first report (E/CN/1987/6) was prepared in 1987 and was based on the activities of 74 non-governmental organizations. The second report (E/CN.9/1989/7) covered 81 organizatons and included information on the human and financial resources devoted to population activities.

[2] Extensive use was made of the *Guide to Sources of International Population Assistance, 1988* and the *Inventory of Population Projects in Developing Countries around the World, 1988/1989*, published by the United Nations Population Fund (UNFPA) and of information collected by the Population Crisis Committee for its updated inventory of organizations in the population field, *Nongovernmental Organizations in International Population and Family Planning*, Population Briefing Paper No. 21, December 1988.

[3] Annex III is based on the responses of the 81 organizations covered in the 1989 report (E/CN.9/1989/7), and thus refers to the period 1986-1987.

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ANNEX I

General information on intergovernmental and non-governmental organizations in the field of population

Organization	Head-quarters	Geographical coverage			Nature of the organization					Participation in United Nations activities				Status with the Economic and Social Council
		Nat	Reg	Gl	PA	TA	FA	RA	IEC	IM	Sem	Prj	Std	
The Alan Guttmacher Institute (AGI)	USA	x		x				1	2	x				NA
American Public Health Association	USA	x		x	x	x			x	x	x	x		NA
Asia Foundation	USA		x			3	1		2					II
Associated Country Women of the World	UK			x		x	x	x	x	x	x	x		
Association for Population/Family Planning Libraries and Information Centers (APLIC)	USA			x	x	x				x	x			NA
Batelle Memorial Institute	USA	x						1						R
Centre for Development and Population Activities (CEDPA)	USA			x		1	2		3	x		x		II
Center for Population Communications International	USA			x		2		3	1	x	x	x		R
Church World Service	USA			x		2	4	3	1	x	x	x		II
Committee for International Co-operation in National Research in Demography (CICRED)	France			x		3		2	1	x	x	x	x	R
Family Health International (FHI)	USA			x		x	x	x	x	x	x			NA
Family Planning International Assistance (FPIA)	USA			x		2	1			x				NA
Ford Foundation	USA	x		x			1			x				NA
The Futures Group	USA	x		x		x	x	x	x		x			NA
General Service Foundation	USA	x		x			1							
Global Committee of Parliamentarians on Population and Development (GCPPD)	USA			x					1	x	x			II
The William and Flora Hewlett Foundation	USA	x		x			1		2	x	x			NA
Institute for Resource Development (IRD)/Westinghouse Corporation	USA			x		x		x		x	x	x		NA
Inter-American Statistical Institute	Panama			x					1		x			II
International Alliance for Women	Malta			x		2		3	1	x	x	x		I
International Association of Gerontology	USA			x	1					x	x		x	R
International Centre for Health Development and Research	Kenya		x			x		x	x					NA
International Committee of Catholic Nurses	Holy See			x	x			x	x	x				R
International Confederation of Midwives	UK			x	x				x	x	x			I
International Council of Women	France			x		x		x	x	x	x	x	x	I

ANNEX I (*continued*)

Organization	Head-quarters	Geographical coverage			Nature of the organization					Participation in United Nations activities				Status with the Economic and Social Council
		Nat	*Reg*	*Gl*	*PA*	*TA*	*FA*	*RA*	*IEC*	*IM*	*Sem*	*Prj*	*Std*	
International Council on Management of Population Programmes (ICOMP)	Malaysia			x	1	4	2	3	5	x	x	x		II
International Federation for Family Health	Indonesia			x	1			2	3	x	x		x	NA
International Federation for Family Life Promotion (IFFLP)	USA			x		x	x	x		x	x	x	x	NA
International Federation of Gynecology and Obstetrics (IFGO)	UK			x	x			x	x	x				R
International Federation on Ageing	UK			x		2		3	1	x	x	x	x	II
International Geographical Union	UK			x	1	4	5	2	3	x	x	x	x	NA
International Institute for Applied Systems Analysis (IIASI).	Austria			x				1	2		x		x	NA
International Institute for Environment and Development (IIED)	UK			x				x	x	x	x			R
International Institute for Vital Registration and Statistics	USA			x	1			3	2		x			II
International Institute of Rural Reconstruction (IIRR)	Philippines			x		1		3	2	x	x		x	I
International Movement ATD Fourth World	France			x		x	x	x	x		x			II
International Planned Parenthood Federation (IPPF)	UK			x		3	2	4	1	x	x	x	x	I
International Right to Life Federation	Switzerland			x					1	x				II
International Sociological Association	Spain			x	x			x						II
International Statistical Institute (ISI)	Netherlands			x		1		2	3	x	x	x	x	II
International Union for Conservation of Nature and Natural Resources (IUCN)	Switzerland			x		x		x	x	x	x			II
International Union for the Scientific Study of Population (IUSSP)	Belgium			x	1	5	4	3	2	x	x	x		II
Inter-Parliamentary Union	Switzerland			x				x	x	x			x	I
Japanese Organization for International Co-operation in Family Planning (JOICFP)	Japan	x	x	x		1	2	4	3		x	x	x	NA
Management Sciences for Health	USA			x		1		2		x	x	x	x	R
National Audubon Society	USA	x		x				2	1	x	x	x	x	R
Opera Pia International	USA			x				2	1	x	x			NA
Overseas Development Council (ODC)	USA			x				1	2	x			x	NA
Oxfam	UK			x			1		2	x				II
Pan African Institute for Development	Switzerland		x		4		3	2	1	x	x	x	x	II

Pathfinder Fund	USA			x		x	x	x	x	x	x	x		NA
Population Association of America	USA	x		x	1		3	x	2					NA
Population Communication	USA			x		x		x	x	x				II
The Population Council	USA			x		x		x	x	x	x	x	x	R
Population Crisis Committee (PCC)	USA			x			3	2	1				x	R
Population Institute	USA			x					1	x	x			NA
Population Reference Bureau (PRB)	USA			x		3		2	1	x	x	x		NA
Population Resource Center (PRC)	USA			x				2	1	x	x	x	x	NA
Population Services International	USA			x		1		3	2					NA
Programme on Population Activities in Latin America (PROLAP)	Argentina		x			x		x	x	x	x			NA
Programme for Appropriate Technology in Health (PATH)	USA			x		1	3		2	x	x	x	x	R
Rand Corporation/Population Research Center	USA			x		3		1	2		x		x	NA
Research Triangle Institute (RTI)	USA			x		1	4	2	3	x	x	x	x	NA
The Rockefeller Foundation	USA	x		x			1			x	x			NA
Save the Children	USA			x		1	3	4	2			x		NA
Sierra Club	USA	x							1					I
Soroptimist International	UK			x	1		2		3	x	x			NA
Transnational Family Research Institute	USA			x		1	4	2	3		x		x	NA
University Research Corporation	USA	x		x		2		1	3	x		x		I
World Assembly of Youth (WAY)	Denmark			x		3	2	4	1	x	x	x	x	II
World Association of Girl Guides and Girl Scouts	UK			x					1					R
World Education	USA			x		1		2	3					
World Federation for Voluntary Surgical Contraception (WFVSC)	USA			x	3	4		2	1	x	x	x	x	R
World Movement of Mothers	France			x					1					II
World Organization of the Scout Movement	Switzerland			x					x	x				II
World Organization/Ovulation Method/Billings (WOOMB)	Australia			x	3	4	5	2	1					NA
World Population Society (WPS)	USA			x		x	x		x	x	x	x	x	II
World Resources Institute (WRI)	USA			x		x		x	x	x	x	x	x	NA
World Union of Catholic Women's Organizations	France			x				x	x	x				II
Worldwatch Institute	USA			x				x	x		x		x	NA
Zero Population Growth (ZPG)	USA	x		x					1	x				NA

Source: Responses of the organizations to a United Nations questionnaire prepared in 1988.

NOTES: The labels of the columns have been abbreviated as follows:

Geographical coverage:
- Nat: National
- Reg: Regional
- Gl: Global

Nature of the organization:
- PA: Professional association
- TA: Provision of technical assistance
- FA: Provision of financial assistance
- RA: Research and analysis
- IEC: Information, education and communication
- 1-5: Level of involvement

Participation in activities organized by the United Nations:
- IM: Intergovernmental meetings
- Sem: Technical seminars and workshops
- Prj: Execution of projects on behalf of the United Nations
- Std: Completion of studies requested by the United Nations

Status of the organization with the Economic and Social Council:
- P: Permanent status
- I: Category I (interest in most of the activities of the Council)
- II: Category II (interest in a few areas of the activities of the Council)
- R: Roster
- NA: The organization has not applied for consultative status with the Council

A hyphen (-) indicates that the item is not applicable; the letter "x" indicates that the item is relevant to the organization.

ANNEX II

Human and financial resources of non-governmental organizations in the field of population, 1986-1987

Organization	Resources of the organization				Sources of financial resources for population activities[a] (percentage)						
	Total Bdgt	Population resources									
		Bdgt	Prop	Prof	F	Gv	UN	Prv	End	Sls	Oth
The Alan Guttmacher Institute (AGI)	7 100	7 100	100	50	3	8	1	78	5	5	0
American Public Health Association	5 000	100	5	3	..	..	..	..	..	..	..
Asia Foundation	17 712	3 121	18	8	0	99	0	1	0	0	0
Associated Country Women of the World	..	..	..	..	..	..	..	..	..	..	..
Association for Population/Family Planning Libraries and Information Centers (APLIC)	..	..	100	..	..	..	..	..	..	..	..
Batelle Memorial Institüte	10 300	1 600	16	8	0	100	0	0	0	0	0
Centre for Development and Population Activities (CEDPA)	4 590	4 157	91	29	0	62	10	28	0	0	0
Center for Population Communicatons International	809	809	100	6	0	0	4	96	0	0	0
Church World Service	1 500	300	20	0	0	0	0	100	0	0	0
Committee for International Co-operation in National Research in Demography (CICRED)	729	729	100	5	0	69	31	0	0	0	0
Family Health International (FHI)	..	20 000	..	..	0	97	0	3	0	0	1
Family Planning International Assistance (FPIA)	41 700	41 700	100	91	0	95	0	5	0	0	0
Ford Foundation	429 900	28 511	7	10	0	0	0	0	100	0	0
The Futures Group	28 000	18 000	64	47	0	98	2	0	0	0	0
General Service Foundation	..	..	33	..	..	..	..	..	..	..	..
Global Committee of Parliamentarians and Development (GCPPD)	1 500	1 500	100	8	0	25	25	50	0	0	0
The William and Flora Hewlett Foundaton	66 260	12 138	18	1	0	0	0	0	100	0	0
Institute for Resource Development (IRD)/Westinghouse Corporation	9 000	9 000	100	27	0	100	0	0	0	0	0
Inter-American Statistical Institute	85	13	15	..	25	75	0	0	0	0	0
International Alliance for Women	..	..	..	..	..	..	..	..	..	..	..
International Association of Gerontology	..	..	10	..	..	..	..	..	..	..	..
International Centre for Health Development and Research	..	..	..	..	..	..	..	..	..	..	..
International Committee of Catholic Nurses	..	..	..	..	..	..	..	..	..	..	..
International Confederation of Midwives	..	..	..	..	..	..	..	..	..	..	..

ANNEX II (*continued*)

Organization	Resources of the organization				Sources of financial resources for population activities[a]						
	Total Bdgt	Population resources			F	Gv	UN	Prv (percentage)	End	Sls	Oth
		Bdgt	Prop	Prof							
International Council of Women	..	..	..	..	..	..	..	..	..	..	..
International Council on Management of Population Programmes (ICOMP)	1 100	950	86	35	1	40	40	8	0	1	0
International Federation for Family Health	..	..	37	..	..	..	..	..	..	..	..
International Federation for Family Life Promotion (IFFLP)	..	3 000	..	..	0	88	3	9	0	0	0
International Federation of Gynecology and Obstetrics (IFGG)	..	..	..	..	..	..	..	..	..	..	..
International Federation on Ageing	..	..	..	..	..	..	..	..	..	..	..
International Geographical Union	..	..	100	..	..	..	..	..	..	..	..
International Institute for Applied Systems Analysis (IIASI)	22 600	600	3	5	39	11	0	0	0	0	0
International Institute for Environment and Development (IIED)	..	..	..	..	..	..	..	..	..	..	..
International Institute for Vital Registration and Statistics	..	..	100	1	0	0	100	0	0	0	0
International Institute of Rural Reconstruction (IIRR)	1 500	188	13	187	0	0	100	0	0	0	0
International Movement A.T.D. Fourth World	..	..	..	..	..	..	..	..	..	..	..
International Planned Parenthood Federation (IPPF)	111 442	111 442	100	119	0	95	2	3	0	0	0
International Right to Life Federation	100	..	..	1	..	..	..	..	..	..	..
International Sociological Association	120	4	3	..	..	..	..	..	..	..	..
International Statistical Institute (ISI)	..	..	30	..	..	..	..	..	..	..	..
International Union for Conservation of Nature and Natural Resources (IUCW)	..	..	5	1	..	..	..	..	..	..	..
International Union for the Scientific Study of Population (IUSSP)	2 372	2 372	100	5	11	42	23	20	0	4	0
Inter-Parliamentary Union	7 720	..	..	1	100	0	0	0	0	0	0
Japanese Organization for International Co-operation in Family Planning (JOICFP)	9 000	9 000	100	22	—	5	68	25	1	0	1
Management Sciences for Health	..	7 400	..	8	0	100	0	0	0	0	0

National Audubon Society	..	..	10	..	..	..	..	..	..	..	..
Opera Pia International	..	..	..	..	..	..	..	..	..	..	..
Overseas Development Council (ODC)	..	..	5	..	..	..	..	..	..	..	..
Oxfam	..	..	2	..	..	..	..	..	..	..	..
Pan African Institute for Development	..	..	75	..	..	..	..	..	..	..	..
Pathfinder Fund	28 100	28 100	100	190	0	90	0	10	0	0	0
Population Association of America	600	600	100	..	33	0	0	0	0	57	10
Population Communication	600	600	100	..	..	..	..	..	..	..	..
The Population Council	42 400	42 400	100	182	0	52	5	28	15	0	0
Population Crisis Committee (PCC)	6 000	6 000	100	20	0	0	7	92	1	0	0
Population Institute	4 000	4 000	100	9	0	0	10	80	0	10	0
Population Reference Bureau (PRB)	4 672	4 672	100	40	6	43	0	16	1	34	0
Population Resource Center	800	800	100	6	..	..	..	..	..	..	..
Population Services International	11 000	11 000	100	35	0	60	0	20	10	10	0
Programme on Population Activities in Latin America (PROLAP)	..	..	100	..	..	..	..	..	..	..	..
Programme for Appropriate Technology in Health (PATH)	11 500	5 800	50	25	0	12	60	17	10	1	0
Rand Corporation/Population Research Center	1 000	1 000	100	12	..	..	..	..	..	..	..
Research Triangle Institute (RTI)	140 000	4 000	3	15	0	95	5	0	0	0	0
The Rockefeller Foundation	116 682	20 833	18	4	0	0	0	0	100	0	0
Save the Children	154 791	1 000	1	21	0	10	0	30	0	0	60
Sierra Club	26 000	60	1	1	0	0	0	100	0	0	0
Soroptimist International	..	..	..	..	..	..	..	..	..	..	..
Transnational Family Research Institute	..	..	100	..	..	..	..	..	..	..	..
University Research Corporation	6 400	3 000	47	12	0	100	0	0	0	0	0
World Assembly of Youth (WAY)	600	300	50	6	10	10	25	0	50	0	5
World Association of Girl Guides and Girl Scouts	..	..	..	..	..	..	..	..	..	..	..
World Education	..	..	5	..	..	..	..	..	..	..	..
World Federation for Voluntary Surgical Contraception (WFVSC)	950	950	100	..	2	94	2	2	0	0	0
World Movement of Mothers	3 000	600	20	1	33	0	0	67	0	0	0
World Organization of the Scout Movement	..	..	..	..	..	..	..	..	..	..	..
World Organization/Ovulation Method/Billings (WOOMB)	80	80	100	8	0	60	0	0	0	0	40
World Population Society (WPS)	410	410	100	6	0	0	65	5	0	30	0
World Resources Institute (WRI)	..	..	..	..	..	..	..	..	..	..	..

ANNEX II (*continued*)

Organization	Resources of the organization				Sources of financial resources for population activities[a]						
	Total Bdgt	Population resources									
		Bdgt	Prop	Prof	F	Gv	UN	Prv	End	Sls	Oth
					(percentage)						
World Union of Catholic Women's Organizations	..	..	..	..	..	..	..	..	..	..	..
Worldwatch Institute	..	..	..	..	..	..	..	..	..	..	..
Zero Population Growth (ZPG)	1 554	1 554	100	14	40	0	0	57	—	1	2
TOTAL	1 341 278	421 493	31	1 285	1	66	4	11	17	1	—

Source: Responses of the organizations to a United Nations questionnaire prepared in 1988.

NOTES: The labels of the columns have been abbreviated as follows:
Resources of the organization:
Total Bdgt: Biennial total budget in thousands of United States dollars
Bdgt: Biennial budget devoted to population in thousands of United States dollars
Prop: Proportion of the total budget devoted to population
Prof: Total number of professionals working in population
Sources of financial resources for population activities:
F: Membership fees
Gv: Government funds (e.g., grants, contracts etc.)
UN: United Nations funds (e.g., grants, contracts, etc.)
Prv: Private funds (e.g., grants, donations, contracts, etc.)
End: Endowment funds
SLs: Sales of publications and services
Oth: Other

Two dots (..) indicate that data were not provided by the organization; a dash (—) indicates that the amount is negligible; a hyphen (-) indicates that the item is not applicable.

[a]The percentages appearing in the total refer to the 44 organizations that provided information on their financial resources.

ANNEX III

Proportion of resources assigned to population activities by non-governmental organizations

Organization	Population sectors										Functions in the field of population							
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
The Alan Guttmacher Institute (AGI)		x	x		x	x				-	x			x		x	x	-
American Public Health Association	5	10	20	10	10	40	0	0	5	100	0	0	0	5	5	60	30	100
Asia Foundation	0	17	0	0	0	83	0	0	0	100	0	0	6	0	3	74	17	100
Associated Country Women of the World	x	x	x	x		x				-			x		x	x		-
Association for Population/Family Planning Libraries and Information Centers (APLIC)	x	x	x	x	x	x	x	x	x	-	x					x		-
Batelle Memorial Institute	0	30	0	0	0	50	0	0	20	100	100	0	0	0	0	0	0	100
Centre for Development and Population Activities (CEDPA)	10	20	0	10	10	50	0	0	0	100	0	50	5	5	30	5	5	100
Center for Population Communications International	10	10	10	40	5	20	0	5	0	100	0	0	20	5	0	55	20	100
Church World Service	21	21	5	16	2	27	0	0	2	100	0	20	10	0	40	30	0	100
Committee for International Co-operation in National Research in Demography (CICRED)	20	0	0	0	15	0	0	40	25	100	10	0	40	0	10	40	0	100
Family Health International (FHI)		x	x		x	x				-	x	x		x	x	x		-
Family Planning International Assistance (FPIA)	x	x	x			x				-		x	x	x	x	x	x	-
Ford Foundation	x	x	x	x	x	x	x	x	x	-	x	x		x	x	x		-
The Futures Group	10		40			50				100		25	20	10	25		20	100
General Service Foundation	15	20	25	—	0	40	0	0	0	100	0	10	10	0	25	20	35	100
Global Committee of Parliamentarians on Population and Development (GCPPD)	20	20	20	10	5	5	5	5	10	100	25	0	0	0	0	25	50	100
The William and Flora Hewlett Foundation	20	0	20	20	0	40	0	0	0	100	45	15	0	25	10	5	0	100
Institute for Resource Development (IRD)/Westinghouse Corporation	—	—	x	—	x	x	—	—	—	-	70	0	0	30	0	0	0	100
Inter-American Statistical Institute	x	x	x	x	x	x	x	x	x	-	0	0	0	0	0	100	0	100
International Alliance for Women		x				x				-						x	x	-
International Association of Gerontology	49	10	10	10	10	0	5	1	5	100	0	0	0	10	10	80	0	100
International Centre for Health Development and Research					x	x				-	x	x	x	x	x	x	x	-
International Committee of Catholic Nurses	33	7	20	0	20	20	0	0	0	100			x			x		-
International Confederation of Midwives		x			x	x				-			x		x	x		-
International Council of Women	x	x			x	x			x	-		x			x	x	x	-

ANNEX III (*continued*)

Organization	*Population sectors*										*Functions in the field of population*							
	(a)	*(b)*	*(c)*	*(d)*	*(e)*	*(f)*	*(g)*	*(h)*	*(i)*	*(j)*	*(k)*	*(l)*	*(m)*	*(n)*	*(o)*	*(p)*	*(q)*	*(r)*
International Council on Management of Population Programmes (ICOMP)	10	20	5	0	0	60	0	0	5	100	10	0	30	5	30	20	5	100
International Federation for Family Health		x	x		x	x				-	x			x	x	x		-
International Federation for Family Life Promotion (IFFLP)	x	x	x	—	x	x	—	—	x	-	x	x	x	x	x	x	x	-
International Federation of Gynecology and Obstetrics (IFGO)					x	x				-						x		-
International Federation on Ageing	x	x		x	x		x	x	x	-	0	20	0	0	0	30	50	100
International Geographical Union	20	5	10	4	2	2	50	4	3	100	60	0	0	20	0	20	0	100
International Institute for Applied Systems Analysis (IIASI)	20	10	0	0	10	40	0	0	20	100	95	0	0	0	0	5	0	100
International Institute for Environment and Development (IIED)	x			x			x			-	x					x	x	-
International Institute for Vital Registration and Statistics	0	0	0	80	10	10	0	0	0	100	0	0	0	0	0	100	0	100
International Institute of Rural Reconstruction (IIRR)	30	30	0	10	0	30	0	0	0	100	0	40	0	0	40	20	0	100
International Movement A.T.D. Fourth World	x				x				x	-		x	x					-
International Planned Parenthood Federation (IPPF)	15	5	15	—	5	60	0	0	—	100	1	53	23	1	3	—19—		100
International Right to Life Federation						x				-						x	x	-
International Sociological Association	x	x	x	x	x	x	x	x	x	-						x		-
International Statistical Institute (ISI)	—	—	—	10	10	50	10	0	20	100	50	0	0	10	20	20	0	100
International Union for Conservation of Nature and Natural Resources (IUCW)	x		x	x			x			-	x			x	x			-
International Union for the Scientific Study of Population (IUSSP)	7	4	15	6	38	15	8	7	—	100	19	0	0	0	47	34	0	100
Inter-Parliamentary Union	x	x	x	x	x	x	x	x	x	-						x	x	-
Japanese Organization for International Co-operation in Family Planning (JOICFP)	0	0	0	0	0	95	0	0	5	100	5	40	0	5	25	15	10	100
Management Sciences for Health					x	x				-	x	x		x	x			-
National Audubon Society	90	0	10	0	0	0	0	0	0	100	0	0	0	0	0	50	50	100
Opera Pia International	0	0	0	0	0	0	0	0	100	100	x	x	x					-
Overseas Development Council (ODC)	80	10	0	5	0	5	0	0	0	100	20	0	0	0	0	20	10	100
Oxfam	x	x				x				-	x	x			x			-

Pan African Institute for Development	50	15	5	5	10	5	5	0	5	100	45	0	5	5	25	20	0	100
Pathfinder Fund	0	5	10	5	0	75	5	0	0	100	5	50	15	5	10	10	5	100
Population Association of America	x	x	x	x	x	x	x	x	x	-						x		-
Population Communication	x	x	x	x	x	x	x	x	x	-		x	x	x		x	x	-
The Population Council	x	x	x	x	x	x	x	x	x	-	x	x	x	x	x	x	x	-
Population Crisis Committee (PCC)	16	16	20	20	2	20	2	2	2	100	15	15	0	0	0	35	35	100
Population Institute	5	5	5	5	0	80	0	0	0	100	10	0	0	0	5	10	75	100
Population Reference Bureau (PRB)	15	10	5	20	10	10	10	10	10	100	35	0	5	5	10	45	0	100
Population Resource Center (PRC)	10	10	10	10	10	10	10	20	10	100	25	0	0	25	0	25	25	100
Population Services International					x	x				-	5	70	0	5	10	10	0	100
Programme on Population Activities in Latin America (PROLAP)	x	x	x	x	x	x	x	x	x	-	x		x	x	x	x	x	-
Programme for Appropriate Technology in Health (PATH)	0	0	0	0	0	100	0	0	0	100	0	50	0	0	25	25	0	100
Rand Corporation/Population Research Center	0	0	10	10	0	10	20	—	50	100	80	0	0	0	5	15	0	100
Research Triangle Institute (RTI)	25	10	25	20	5	10	10	0	5	100	30	0	0	20	30	10	10	100
The Rockefeller Foundation	0	2	43	0	0	55	0	0	0	100	63	0	0	2	35	0	0	100
Save the Children	60	10	0	5	0	15	0	0	0	100	5	10	5	0	50	10	20	100
Sierra Club	50	0	10	20	0	20	0	0	0	100	50	0	0	30	0	0	20	100
Soroptimist International	x	x			x		x	x		-						x	x	-
Transnational Family Research Institute	25	25	10	0	0	40	0	0	0	100	85	0	0	0	0	15	0	100
University Research Corporation	10	5	20	5	10	50	0	0	0	100	30	0	0	50	10	10	0	100
World Assembly of Youth (WAY)	50	20	0	10	0	20	0	0	0	100	10	0	25	0	20	20	15	100
World Association of Girl Guides and Girl Scouts		x			x	x				-	-		x		x	x		-
World Education	60	25	0	0	0	5	0	10	0	100	0	0	0	0	100	0	0	100
World Federation for Voluntary Surgical Contraception (WFVSC)	0	0	0	0	0	100	0	0	0	100	x					x		-
World Movement of Mothers		x				x				-	x			x		x	x	-
World Organization of the Scout Movement	x	x			x	x			x	-	x					x		-
World Organization/Ovulation Method/Billings (WOOMB)	10	10	0	0	0	80	0	0	0	100	0	60	10	0	20	10	0	100
World Population Society (WPS)	x		x	x	x	x			x	-		70			10		20	100
World Resources Institute (WRI)	x	x	x	x	x	x	x		x	-	x	x		x		x	x	-
World Union of Catholic Women's Organizations		x			x	x	x	x	x	-						x		-
Worldwatch Institute	x		x	x	x	x			x	-	x					x	x	-
Zero Population Growth (ZPG)		x	x	x			x			-							x	-

Source: Responses of the organizations to a United Nations questionnaire prepared in 1988.

NOTES: The labels of the columns are as follows:

Population sectors:

(*a*): Population, resources, the environment and development
(*b*): The role and the status of women
(*c*): Development of population policies

Population policies and goals:

(*d*): Population growth
(*e*): Morbidity and mortality
(*f*): Reproduction and the family
(*g*): Population distribution and internal migration
(*h*): International migration
(*i*): Population structure
(*j*): Total of resources by population sector

Functions in the field of population (promotion of knowledge and policy):

(*k*): Data collection, research and analysis

Management of population activities:

(*l*): Direct provision of services
(*m*): Counselling and guidance (including advisory in managerial matters)
(*n*): Evaluation of population activities

Information, education and communication:

(*o*): Training
(*p*): Dissemination of information and communication
(*q*): Awareness for public action
(*r*): Total of resources by functions in the field of population

Two dots (..) indicate that data were not provided by the organization; a dash (—) indicates that the amount is negligible; a hyphen (-) indicates that the item is not applicable; the letter "x" indicates that the item is relevant to the organization but that no percentage figures were provided.

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