

Roche, Frederick C.

Working Paper

The Demographic Transition in Sri Lanka: Is Development Really a Prerequisite?

Staff Paper, No. SP 76-05

Provided in Cooperation with:

Charles H. Dyson School of Applied Economics and Management, Cornell University

Suggested Citation: Roche, Frederick C. (1976) : The Demographic Transition in Sri Lanka: Is Development Really a Prerequisite?, Staff Paper, No. SP 76-05, Cornell University, Charles H. Dyson School of Applied Economics and Management, Ithaca, NY,
<https://doi.org/10.22004/ag.econ.184776>

This Version is available at:

<https://hdl.handle.net/10419/276461>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

THE DEMOGRAPHIC TRANSITION IN SRI LANKA:
IS DEVELOPMENT REALLY A PREREQUISITE?

By

Frederick C. Roche

January 1976

No. 76-5

Table of Contents

	<u>Page</u>
I. World Population and the Demographic Transition	1
The Demographic Transition of the West	3
Factors Behind the Mortality Decline in the West	3
Factors Behind the Fertility Decline in the West	5
Is the Western Experience Relevant Today?	7
The Cases of Kerala and Sri Lanka	8
II. Introduction to Sri Lanka: The Economic and Demographic Situations	9
Sri Lanka -- The Welfare State	11
Recent Population Trends -- The Decline in Mortality	12
Recent Population Trends -- The Decline in Fertility	15
III. The Roles Played by Urban-Industrial Development and Rising Incomes in Sri Lanka's Fertility Decline	21
Industrialization in Sri Lanka	21
Urbanization	21
The Growth of Personal Income	25
IV. Development Denied?	27
Declining Mortality and the Effects of Health Care	27
The Food Subsidies	28
Education	34
Income and Social Security Schemes	35
The National Family Planning Program	37
Summary and Conclusions	38
Citations	41

THE DEMOGRAPHIC TRANSITION IN SRI LANKA: IS DEVELOPMENT
REALLY A PREREQUISITE?*

By

Frederick C. Roche

Part I -- World Population and the Demographic Transition

A significant part of the population growth theory currently prevailing is based upon the historical experience of the Western world since the late 1600's. Figure 1 diagrams the growth of the world's population from the beginning of the Christian era. From 1 A.D. until roughly the end of the European Renaissance period, human numbers grew quite slowly, with births only slightly exceeding deaths. After that time, however, the growth rate began to take off at a rapidly increasing pace. Admittedly, this is merely an illustrative diagram, for the growth of population was certainly not as smooth as that depicted here. Nor was this sudden upsurge of growth unique in human history.^{1/}

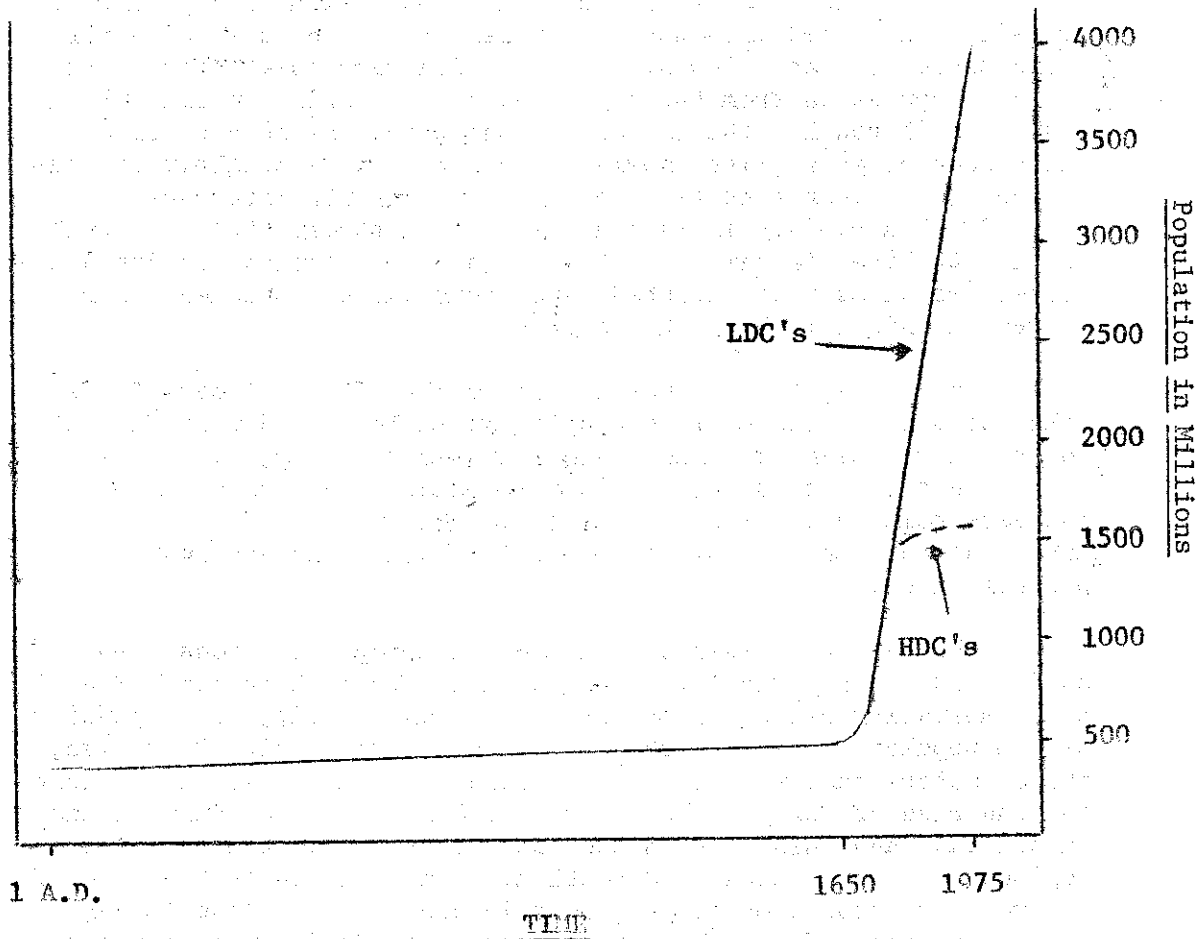
In any event, evidence indicates that 500 million is a reliable estimate of the world's population in 1650, and that this number had never been exceeded at any earlier date (30, p. 8). From that time to the present, the human population has undergone an increase some seven times greater than that which had occurred during all of man's past. The word 'explosion' is not inappropriately used.

This growth originated in Western Europe as a consequence of social and technological factors which led to a sharp reduction of human mortality rates. With births high and steady, the beginnings of the population takeoff shown in Figure 1 resulted. Over time, these factors came to influence demographic trends overseas, first in countries of European heritage (the United States, Canada, and Australia), and then, within the last hundred years, in the colonial regions of Asia, Africa, and South America. But while the bulk of the world's population growth today is occurring in these latter areas, the rate of growth peaked in the West during the nineteenth century, and then leveled off as birth rates began to decline.

*In slightly modified form, this paper was first submitted as a part of the requirements for Agricultural Economics 660: Food, Population, and Employment, Fall term 1975/76.

^{1/} Twice previously in history, man made adaptations to the environment which allowed his numbers to increase in a relatively sudden jump. The first occurred several million years ago when he became a tool maker and hunter. The second came some ten thousand years ago and marked the emergence of Neolithic Man: the domesticator of plants and animals.

FIGURE 1. HUMAN POPULATION GROWTH SINCE 1 A.D.*



*Source: Adapted from T.T. Poleman, World Food: A Perspective,
Cornell Int'l. Ag. Reprint No. 59, July, 1975.

The Demographic Transition of the West

The pattern of mortality and natality behavior which characterizes the Western experience has come to be known as the Demographic Transition. An illustration of this phenomenon is provided in Figure 2. In the first stage of the transition, equivalent to the West prior to about 1700, both birth and death rates are high, with the former stable and perhaps at or near the biological maximum, while the latter are more erratic due to the random effects of famine and pestilence. Total population during this period is more or less constant.

In the transition's second stage, as occurred in the West during the early 1700's, mortality rates begin to decline. As the gap between births and deaths widens, the growth of population becomes increasingly rapid. Only as births begin a similar decline in the latter portion of this stage does the rate of growth start to slow. Again, this was the case in the West during the second half of the nineteenth century.

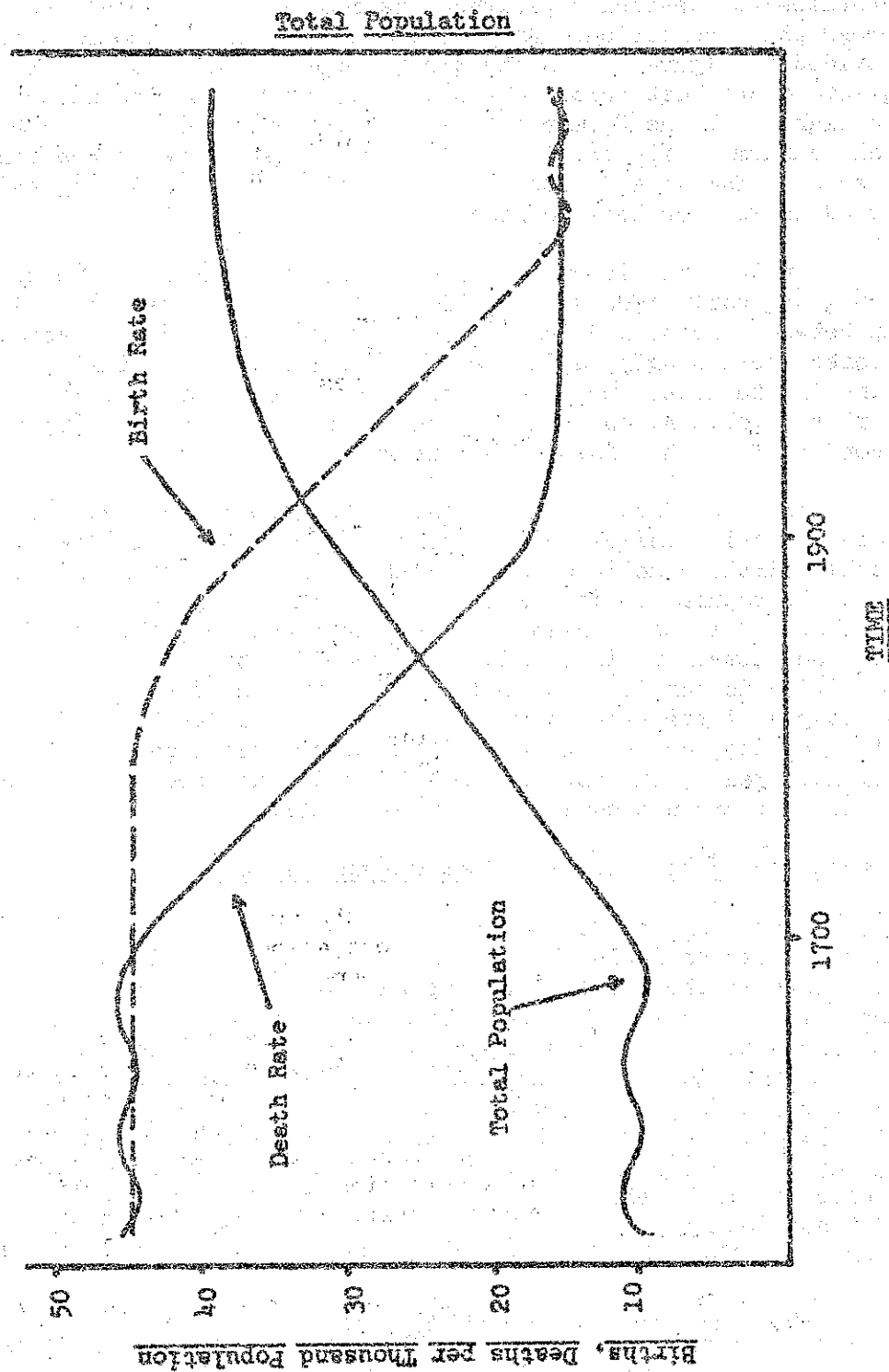
When the final stage of the transition is entered, death rates reach a stable minimum while births are decreasing rapidly. Ultimately, births come into rough equilibrium with deaths and once again the population is fairly stable. This would be equivalent to the slow and in some cases zero or even negative growth which typifies the Western nations today. It should be noted that the demographic transition is merely a theoretical description of historical events. The stages of the transition did not take place at the same time in all countries, nor under precisely similar social and economic conditions. Hence, the motive forces behind this process as it occurred in the West are not entirely easy to identify.

Factors Behind the Mortality Decline in the West

Regarding the decline in mortality, "the main underlying causes appear to include a complex of factors associated with improvements in the level of living and environment" (37, p. 146). In particular, a series of developments over the course of two-and-one-half centuries acted to mitigate the previously disastrous effects of food shortages and communicable disease. Advances in agriculture beginning in Europe during the early 1700's led to a larger, more reliable food supply and the surpluses necessary to support a growing population (15, p. 111). While outright famines were more spectacular, it is likely that chronic insufficiencies in food supplies had traditionally resulted in greater overall mortality due to the lowering of the body's resistance to infection and disease (27, p. 51).

In addition, sanitary reforms and public health measures were instituted in the early 1800's, and a greater concern for personal hygiene came to exist. Though medicine was still a relatively primitive art, hospitals and health boards became more common and served to isolate the contagiously ill from the healthy (37, p. 119; 14, pp. 290-291). Social reforms during this period in the areas of housing and working conditions, education, and pension, insurance, and other social security schemes all acted directly and indirectly

Figure 2. The Demographic Transition in the West*



*Source: Adapted from J.W. Mellor, The Economics of Agricultural Development, Cornell University Press, 1966.

to improve health and well-being (17, p. 159). Finally and most importantly, the Industrial Revolution was emerging and a rising middle class was slowly being created with incomes sufficient to take advantage of all these developments. Although large numbers of people lived in abject poverty during the early stages of industrialization, a gradual increase in real wages over the long run resulted in a better fed, clothed, housed, and hence healthier population (15, pp. 113-114).

Conspicuous by its absence from the above discussion is the role of medicine in declining Western mortality. The fact is that this science seems to have played only a minor part until the early twentieth century, when medical research previously having little practical significance finally bore fruit in the forms of vaccines, drugs, and new surgical techniques (37, pp. 149-153). While these advances certainly had a strong impact in the West, the decline of mortality was already well-established by this time and it is fair to say that their most dramatic effect was and is today being made in the less-developed countries.

Factors Behind the Fertility Decline in the West

In sum then, a combination of factors which may be put under the general heading of 'economic development' seems to have caused the decline in mortality during the demographic transition of the West. Though the heading may be the same, however, the causal linkages which influenced birth rates are much less clear. A given birth rate is the resulting average of innumerable private decisions (or lack of same) made by potential parents concerning the number of children they wish to have. Changes in the birth rate over time therefore go hand in hand with changes in the average family size, or more specifically, with changes in the fertility rate, i.e., the average number of children produced by a woman during her reproductive years. The factors which influence parental decisions regarding family size are overwhelmingly social in nature and arise from a complex web of interrelated anthropological and economic variables. It is the social character of these factors and the micro-level at which parental decisions are made that make analysis of the causal relations underlying fertility rate changes so difficult.

The problem is perhaps best approached by distinguishing between two tiers of factors which influence fertility behavior. The first would consist of those factors which operate at the micro-level prior to and within the marital union. Given a static social setting, physiological and cultural conditions will determine the extent to which a woman is exposed to conception and able to produce offspring. These would include such things as the average age of marriage, coital frequency, natural fecundity or infecundity, the use or non-use of contraceptive devices, and successful or unsuccessful gestation and childbirth. Basically, these conditions become operative once some or all decisions regarding the desirability of children have been made.^{2/}

^{2/} The above summarizes the analysis of factors controlling fertility given by Kingsley Davis and Judith Blake, and is taken from 17, p. 77).

The second tier of factors operate at the macro-level and exert their influence on the parental decision-making process itself. In a dynamic setting such as existed in the West during its period of economic development, changing social conditions are presumed to have led to parental decisions favoring lowered fertility. As the Western nations industrialized, movements of population took place from rural to urban areas. While the lot for many of these migrants was one of poverty and disease during the early stages of this process, the gradual increase of incomes which occurred in the urban centers resulted in a rising standard of living. Propelled by this growing affluence, the stage was set for a decline in the levels of fertility.

In a traditional rural society, children are economic assets. Cheap to feed and clothe, they can be put to work and hence generate income, and as adults, they become the major form of social insurance for their parents in old age. But due to the high infant mortality typically prevailing in such a society, it is often necessary that two or more children be produced to insure the survival of one into adulthood. In a developing urban-industrial society such as the West during the 1800's, these realities change. Rising living standards resulted in a concurrent decline in mortality, and though the exact time is difficult to determine, at some point this decline was felt in the form of reduced child deaths. Over time it therefore became possible for women to have fewer births in order to insure that the desired number survived to become adults, and thus the 'risk' utility of the marginal child was slowly eliminated. Moreover, with a rising level of living came increased costs for the upbringing of children, while at the same time social reforms such as child labor laws and pension, insurance, and other social security measures had the effect of decreasing their value as economic assets. In acting to lessen the utility of children, each of these factors provided an impetus for family limitation.

With economic and social development in the West came increasing levels of education and literacy. Of all the factors which contributed to declining birth rates, the relationship between improved education and reduced fertility has been shown to be the strongest (37, p. 88). Education seems to have the effect of making the individual more resistant to cultural norms which promote high fertility and more aware of the personal advantages to be gained from smaller families. Education was especially important for women as it opened the way for their movement into the labor force and away from the traditional roles of mother and homemaker. In so doing, improved education acted directly to lower fertility.

As levels of income and education increased, greater opportunities for social mobility came to exist. The motivation for smaller families was strengthened as it became recognized that the rearing of children absorbed resources that could otherwise be used for a rise in the social scale. As the costs of parenthood rose while the economic role of children declined, the child came to be seen as an investment rather than an asset. The function of the family as a social unit changed also, as extra-familial activities became increasingly important for parents of both sexes. In sum, "the companionate aspect of marriage came to be emphasized over the reproductive aspect, and the parent-child relationship shifted from one of exploitation in quantity to that of cultivation in quality" (37, p. 88).

Is the Western Experience Relevant Today?

Thus it can be seen that the economic development of the West created as by-products social pressures which resulted in the decreasing-fertility stage of the demographic transition. Specifically, the conditions of declining infant mortality, the decreasing economic utility of children, and the changing roles of the woman and family in society led to parental decisions in favor of conscientious family planning at the micro-level and population stabilization for society as a whole. Within the context of the world's current demographic problems, however, a key question arises: How relevant are the development and demographic experiences of the West over the past two centuries to the less-developed and already over-populated nations of Asia, Africa, and South America?

Two major differences between these situations would appear to exist. In the first place, the population 'problem' of the West was created by the process through which it was solved. The initial decline in mortality was the result of a development process which stabilized food supplies on the one hand, and, through the mechanism of rising incomes, afforded a more hygienic human environment on the other. This same development process also provided the impetus for decreased fertility by drastically changing the roles of child, woman, and family in society. In the developing nations today, however, a reduction in mortality has been effected not so much by economic growth as by a combination of inexpensive devices imported from the West: D.D.T., antibiotics, and vaccines to name a few. Hence, it would seem that the process through which population might ultimately be stabilized is not at work in these countries, even though the problems created by decreasing mortality are.

The second and more important difference relates to the nature of development itself. Though the process was slow and by no means wholly equitable, economic development in the West was broadly participatory and its benefits were enjoyed by many. From the standpoint of fertility behavior this was crucial, because for the micro-level attitudes and actions of parents to be changed on the scale that they were, it was essential that the majority be swept up in the rising standards of health and wealth. In the West during the 1800's, the industrial technology was such that labor could be productively absorbed as quickly as it arrived from the rural areas, and thus this necessary participation occurred. Today, however, development is increasingly a capital-intensive process, and to this extent, many will not participate in the third world. In Mexico, for example, industrial growth has resulted in a six-fold increase of the country's Gross Domestic Product since 1940, yet it is estimated that fully half of the population remains untouched by this progress (33, pp. 1-3). This growth has been accompanied by an increasing share of national income going to capital ownership, while a decreasing portion accrues to wages and salaries (33, p. 3). Mexico is hardly an isolated case, as is indicated by the growth of urban slums filled with the unemployed in numerous cities of the developing world. The response of the non-participants has been continuing high levels of fertility, and thus a dilemma would appear to exist, with rapid population growth on the one hand, and what is perhaps the impossibility of participatory, Western-style development on the other. Hence a second question arises: Is development really a prerequisite to a reduction of fertility in these areas?

The Cases of Kerala and Sri Lanka

Events in two countries suggest it is not. In Kerala, one of the poorest states in India, a decline in fertility is already well-established despite any major industrialization or rural-to-urban demographic shift. Between 1960 and 1974, Kerala's birth rate declined from 38.9 per thousand to 27.0 (28). In contrast, India's overall birth rate has fallen only negligibly from 41.0 to 37.2 over the past twenty years, yet significant industrial and urban growth occurred in the country during this period (28). The Kerala government's per capita expenditures on education and health care are the highest in India, with the results that literacy is greater and infant mortality is lower than for any other state in the country (28; 26, pp. 144 and 146). Women are active in community and political affairs, and enjoy the same educational standards as do men. In spite of these advances, however, Kerala's population remains overwhelmingly rural, and the growth of per capita income during the 1960's was slower than for India as a whole, averaging only slightly more than one percent per year (26, p. 84).

Thus it would appear that even though urban-industrial development is not taking place in Kerala, some of the benefits of development are being passed on to the people of the state. Perhaps this can be equated with a redistribution of income in the form of public services for the lower income groups. Unfortunately, statistical data which exist for Kerala are insufficient to permit a detailed analysis of the situation there, so attention will now be turned to Sri Lanka (Ceylon), a second South Asian country where interesting demographic trends are in progress, and one for which adequate empirical data are available.

Part II -- Introduction to Sri Lanka: The Economic and Demographic Situations

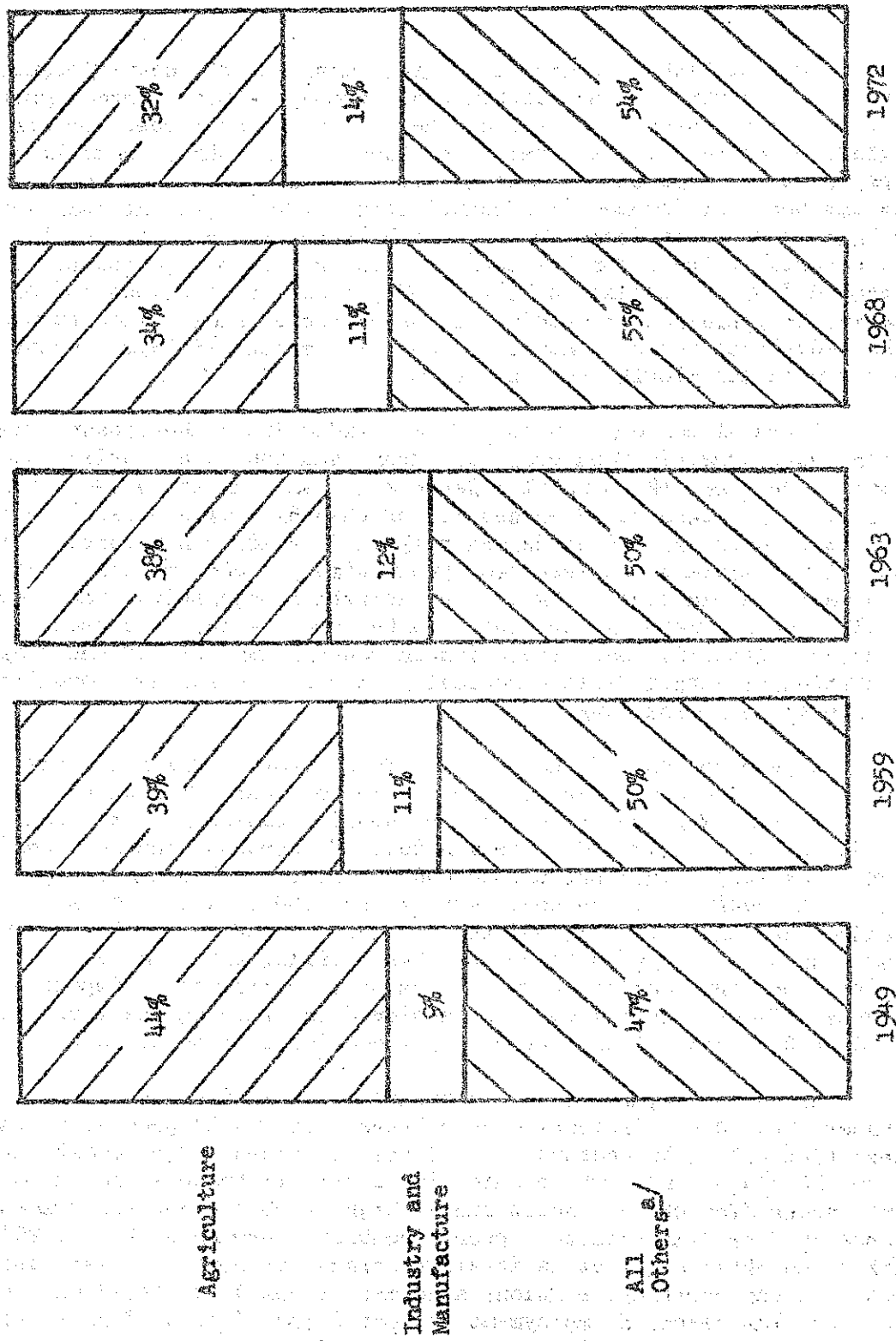
The Sri Lankan economy is largely agrarian and heavily dependent on three export crops -- tea, rubber, and coconuts -- to finance imports of basic consumption goods as well as the capital items needed for development. Roughly 80 percent of the total population of some thirteen million live in rural areas and agriculture accounts for the bulk of the island's employment and personal income. The contribution of the agricultural sector to Sri Lanka's Gross National Product can be seen in Chart 1. Due to a decline in the terms of trade for the country's export crops, agriculture's share decreased from 44 percent in 1949 to 32 percent in 1972, but it nonetheless remains the principal productive sector of the economy. In contrast, the small industrial sector contributed only 14 percent in 1972, a share which has grown rather slowly over the years.

The rural economy can itself be divided into the peasant agricultural sector where domestic food crops are grown and the export-oriented estate sector. From the 1840's until independence was granted in 1948, the British colonial rulers emphasized production of the high-value estate crops while neglecting domestic food needs and relying instead upon imports. The result today is an imbalance between food production and consumption in Sri Lanka which has been exacerbated by a rapid growth of population since World War II. Despite major government efforts over the past two decades to both extend and intensify food production in general and that of the staple rice in particular, supply falls chronically short of demand and food imports are a continuing necessity.

In part because of the need for food imports, Sri Lanka has for some time been living beyond her means. After boom years for export prices during the Korean War period, the country was increasingly forced in the 1950's into deficit financing and a drawing down of foreign exchange reserves in order to satisfy a high private demand for imported consumption goods. This trend continued throughout most of the 1960's as the terms of trade declined, and as a result, capital expenditures suffered. Severe import restrictions were imposed to reduce this outflow, while tax and other incentives were provided to stimulate domestic production of import substitutes. Though success has been achieved in reducing the level of imports, Sri Lanka's balance of payments problem continues to be serious.

High unemployment is an additional problem with which Sri Lankan planners must deal. Estimates range between 14 and 17 percent overall, and these figures fail to account for all the disguised unemployment which exists (7, p. 22; 24, p. 92). The problem is especially troublesome among the educated young, for whom estimates run as high as 85 percent for males and over 90 percent for females in the upper educational brackets (19, p. 29). Sri Lanka's educational system is itself to blame for part of this latter situation. In the British tradition, academic emphasis is placed on the liberal arts, and the growth of employment opportunities in these fields has lagged far behind the rate at which persons so-trained have been produced. More importantly, however, the unemployment problem is a function of the Sri Lankan economy's failure to change structurally in the face of both declin-

CHART 1. SRI LANKA: GROSS NATIONAL PRODUCT BY SECTORIAL ORIGIN, SELECTED YEARS



^{a/} Includes administration, commerce, transport, communication, and services.

Source: John S. Hiscokton, Local Government and Rural Development in Sri Lanka, Cornell C.I.S. Rural Local Government Series No. 14, November 1974.

ing terms of trade and a rapidly growing population (19, p. 17). Moreover, to the extent that imports of consumption goods have displaced those of capital and investment items, the materials necessary for development and the generation of employment have been lacking.

Sri Lanka -- The Welfare State

A large part of the consumption demand in Sri Lanka does not arise autonomously in the private sector. Rather, it can be traced to the high level of consumption subsidies and social services provided by the government. Successive administrations in Sri Lanka have had as a major goal the equilization of social and economic opportunities for the population. Welfare and tax policies have been chosen with the aims of assuring a minimum standard of living for the lowest income groups while at the same time skimming the cream away from those at the top.

Food consumption is subsidized through the provision of important dietary items, most notably rice, either for free or at controlled prices. Education is furnished tuition-free at all levels including the university. The government provides health care throughout the island at no cost to the patient. Public transportation fares are subsidized and prior to 1971, there had not been a rate increase on the country's buses for over twenty-two years. With the possible exception of the estate sector, these services are distributed in an equitable manner throughout Sri Lanka so as to reduce welfare disparities existing between the rural and urban areas.

While almost all persons partake of these measures, a progressive tax structure attempts to insure that those in the upper income groups pay back an amount greater than they receive in benefits. Those earning less than Rs. 400 per month pay no income tax at all, and this includes almost four-fifths of the population (5, p. 57). Above that, the tax rate starts at about five percent of income and rises to about 40 percent in the highest brackets (20, p. 232). What is more, taxes on the wealthy have been increasing over time. In 1953, less than seven percent of the income received by the highest income decile was taken away by taxes, but in 1969, this percentage had tripled (32, p. 87). Indirect taxes are also levied on imported consumer goods, particularly on the expensive luxury items which contribute to Sri Lanka's balance of payments problem. However, these taxes are collected on imported foodstuffs which all income groups must purchase, and to this extent their effect is regressive.

In addition to these direct government redistribution policies, there exist a number of measures which act more or less indirectly to enhance and fortify incomes for the labor force. Though intended to provide incentives for increased food production, government agricultural policies have the effects of protecting tenurial positions and assuring reasonable prices for farmers. Labor policies which include minimum wage laws, social security plans, and other schemes likewise serve to protect the welfare of wage-earners. These measures are particularly significant when it is considered that income from property comprises a large portion of total income in Sri Lanka, yet is received by a relatively small number of persons (24, p. 88). Hence, it is the lower income groups possessing little or no material wealth that benefit most from policies such as these.

The social overhead maintained by the Sri Lankan government does not come cheaply. During the late 1960's for example, the outlay on food subsidies, education, and health care alone constituted some 50 percent of government current expenditure, and about 40 percent of total expenditure (8). Moreover, these percentages have been increasing automatically over the years in response to population growth. A problem exists in that the welfare policies are now accepted as the norm, and as such it has become politically difficult to reduce or eliminate them. In illustration, attempts to cut the food subsidies have met with massive social unrest in the past, and the issue is often used as a "weapon" by politicians seeking to curry favor with voters (11, pp. 100-101).

Apart from the political corner the government seems to have backed itself into, there is also the question of the opportunity costs of the welfare measures. To the extent that scarce resources have been used to maintain current consumption, the development of the Sri Lankan economy has been retarded. It can fairly be concluded that "a diversion of resources from any form of welfare expenditure ... to capital expenditure would have been of greater benefit from the point of view of economic growth" (11, p. 118). Nonetheless, as will be shown in the following pages, the government's social service and income policies have effected a significant redistribution of income and a real rise in the standard of living for Sri Lanka's more economically deprived classes.

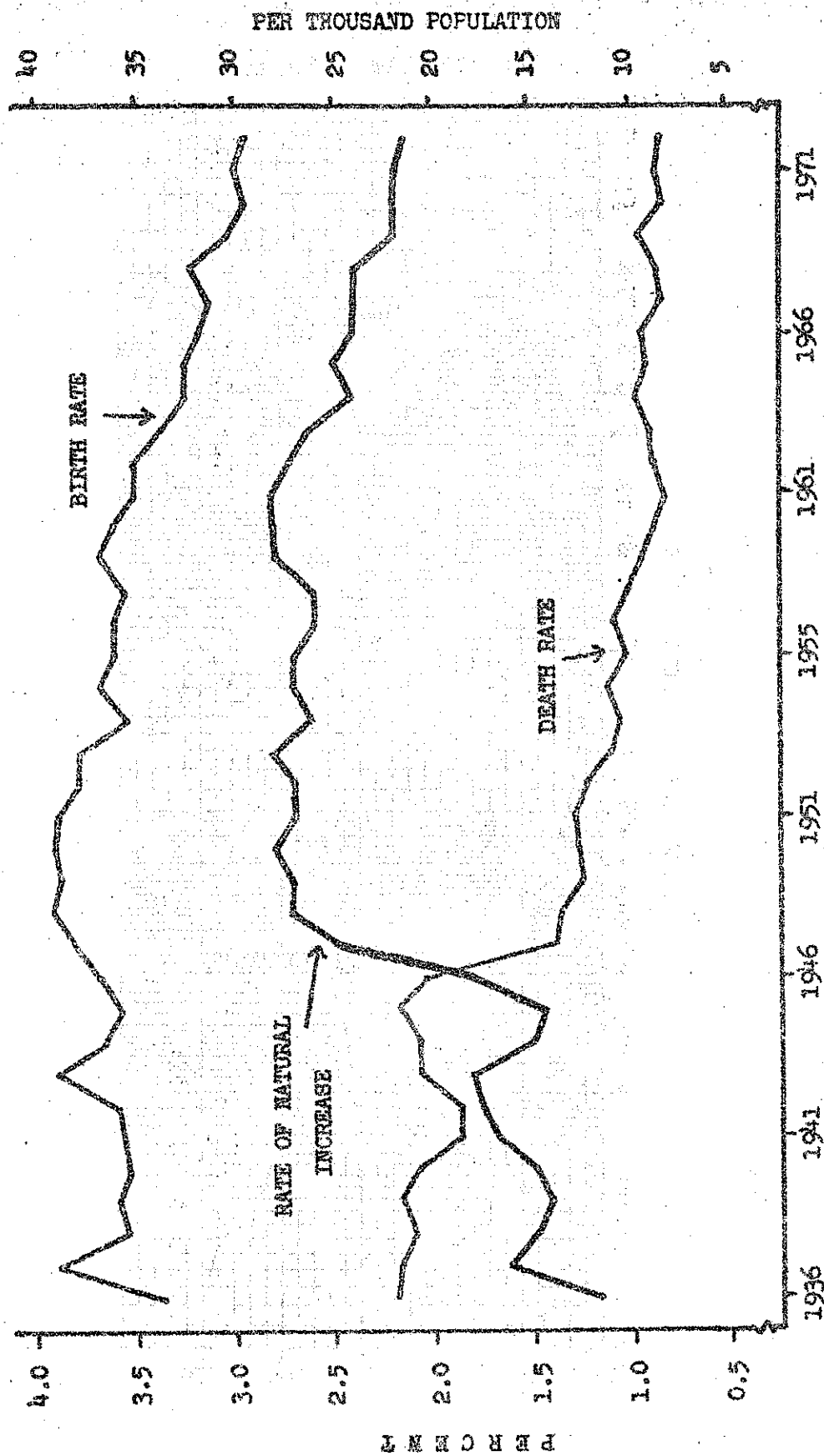
Recent Population Trends -- The Decline in Mortality

This improved standard of living is perhaps best reflected by the effects of Sri Lankan health care policies. Advances made since the end of World War II have resulted in a large decline of overall mortality levels for the population. In 1945, a government program for the spraying of private dwellings with D.D.T. was inaugurated. Within a few years, malaria, long a prime cause of morbidity and death, was essentially eliminated from the island. The pattern of birth, death, and population growth rates since 1936 can be seen in Chart 2. From 1946 to 1947, the death rate fell some 30 percent from 20 to roughly 14 per thousand population, and this decrease has been credited solely to the impact of D.D.T. (1, p. 22; 21, p. 38).

Overall, however, the mortality rate in Sri Lanka had been undergoing a slow, secular decline since the beginning of the 1900's (35, p. 9). By the 1930's, health care facilities were already developed sufficiently to bring diseases such as smallpox, cholera, and plague under control (35, p. 9). Nonetheless, this trend quickened after World War II as medical services were expanded and the medical technology itself was improved (22, p. 25). To the extent nutrition among the poor was upgraded, the government's food subsidies were also a contributing factor. Infectious diseases which had caused over 20 percent of all deaths in 1946 accounted for less than seven percent in 1959, and the total mortality rate declined to a low eight per thousand in the early 1960's (34, p. 319).

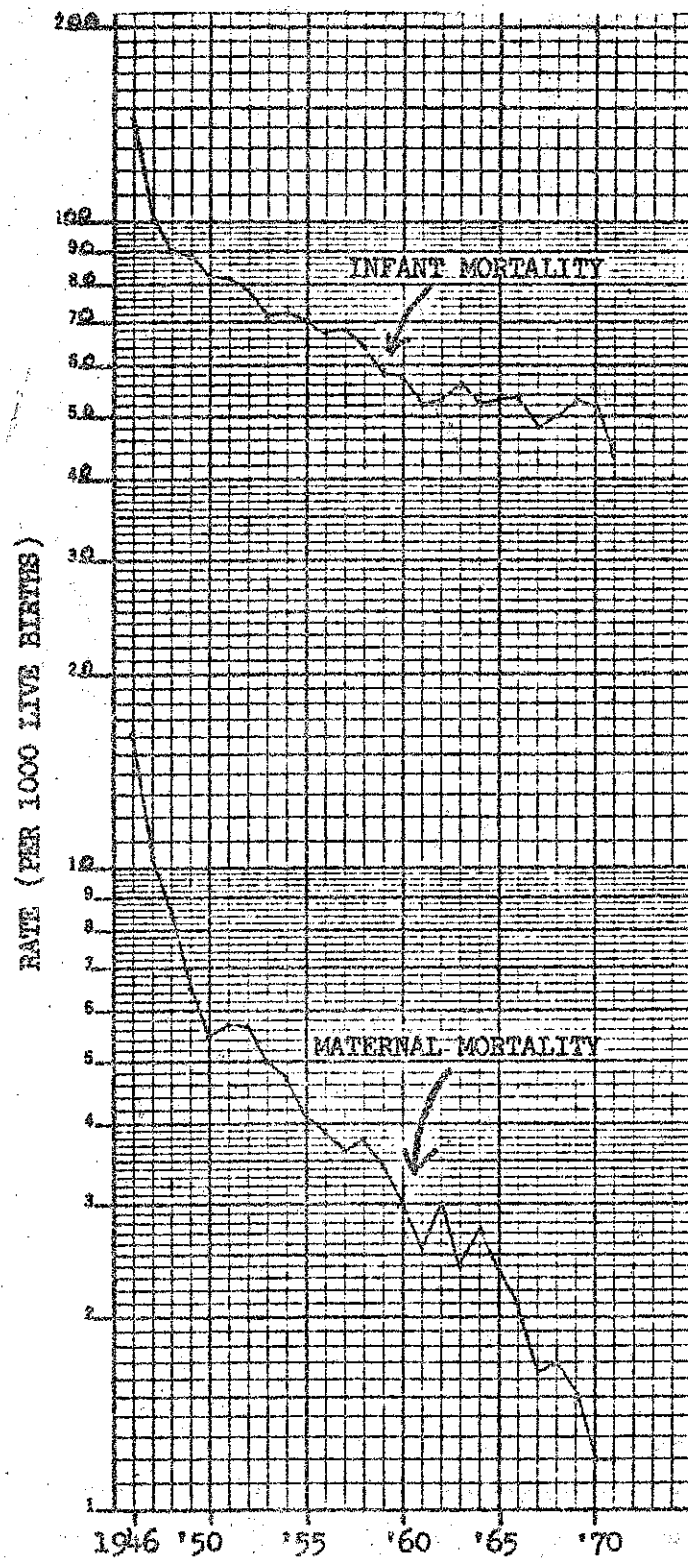
The decline in mortality was particularly noticable in the areas of infant and maternal death rates, as is shown in Chart 3. Deaths of children under one year of age decreased 70 percent from 142 per thousand live births in 1946 to 42 per thousand in 1970. Maternal mortality underwent a concurrent decline during this period, falling from 16.0 to 1.2 per thousand live births, for a drop of over 90 percent. These changes paralleled

CHART 2. SRI LANKA: CRUDE BIRTH, DEATH, AND NATURAL INCREASE RATES, 1936-1972



Source: R. K. Srivastava and A. T. P. L. Abeykoon, "The Demographic Situation in Sri Lanka," extract from The Sri Lanka Labour Gazette, Vol. 25, July 1974.

CHART 3. SRI LANKA: CHANGES IN INFANT AND MATERNAL MORTALITY RATES, 1946-1971
(Log Vertical Scale)



Source: Srivastava and Abeykoon, "The Demographic Situation in Sri Lanka," Sri Lanka Labour Gazette, July 1974.

the general mortality decline which resulted from the factors discussed above, but much credit must also be given to widespread improvements in pre- and post-natal medical care for both mother and child. Currently, almost all births are professionally supervised in Sri Lanka, with about 65 percent taking place in hospitals and maternity homes (22, p. 58).

As can be seen in Chart 2, the result of the decline in malaria-related mortality was a sudden, sharp acceleration of the population's rate of natural increase. The growth rate peaked in 1950 at 2.8 percent per annum and then leveled off for the remainder of the decade.^{1/} During the fifteen year period beginning in 1946, Sri Lanka's population grew from 6.65 million to just under ten million, for an increase of about 50 percent. Average life expectancy has increased from 44 and 42 years for males and females respectively in 1946 to 65 and 67 years today (35, p. 11). The greater rise for women reflects the decline in maternal mortality.

Recent Population Trends -- The Decline in Fertility

Sri Lanka is similar to other developing countries in having experienced a declining mortality rate and accelerated population growth since the end of World War II. While birth rates in many of these nations have remained high and fairly stable, however, in Sri Lanka the opposite has occurred. Since 1953, a slow decline in the levels of fertility has been taking place, and the demographic transition in this country appears on its way to becoming a reality.

Table 1 shows the changes occurring between 1953 and 1970 in age-specific fertility rates for all women. Fertility has declined steadily in almost every category, with general fertility for all ages decreasing from 189.3 births per thousand women in 1953 to 132.7 in 1970, for an overall drop of nearly 30 percent during the seventeen year period. This trend is most pronounced for the youngest groups, where fertility for women aged 15-24 declined by roughly 38 percent. The total fertility decrease from 5.32 to 4.22 births per woman indicates that the 'average' Sri Lankan female can now be expected to produce one less child during her lifetime than she would have in 1953.

Several demographic variables have been identified as being responsible for this trend. For one, a malaria epidemic between the years 1934-1938 claimed the lives of 18 percent of all female infants born. This in turn reduced the number of women in the prime reproductive age groups from 1953 to 1963, and consequently acted to lower the birth rate during these years. This was a solitary incident, however, and had only a temporary effect (35, p. 14).

A second and more important factor was a trend toward a rising average age of marriage that began slowly in the 1920's and gained momentum after World War II (35, p. 14). This was especially important for women because it reduced the portion of the potential reproductive years that they were exposed to pregnancy. Concurrent with this trend was a decrease

^{1/} Repatriation of native Indian Tamils was taking place during this period at an average rate of 8,000 per year (8, 1970). This figure is considered insignificant in relation to overall trends, and hence the simple natural increase rate (births minus deaths) can be taken as the actual rate of population growth (35, p. 13).

TABLE 1.

Sri Lanka: Age-Specific Fertility Rates, Total Fertility Rates, and Percentage Changes, 1953, 1963, and 1970.*

Female Age Group	Birth Rate in Year:			Percent Change 1953-1970
	1953	1963	1970	
15-19	68.2	51.8	37.6	-44.8
20-24	259.3	227.8	171.8	-33.7
25-29	295.1	278.4	238.1	-19.3
30-34	246.0	239.5	219.4	-10.8
35-39	150.1	157.0	133.9	-10.8
40-44	38.1	46.0	37.5	- 1.6
45-49	6.8	6.6	6.0	-11.8
General Fertility Rate (15-49)	189.3	168.8	132.7	-29.9
Total Fertility ^{a/}	5.32	5.04	4.22	-20.7

*Sources -- Dallas Fernando, "A Note on Differential Fertility in Sri Lanka," Demography, Vol. 11, No. 3, August, 1974.

Nicholas Wright, "Recent Fertility Changes in Ceylon and Prospects for the National Family Planning Program," Demography, Vol. 5, No. 2, May, 1968.

^{a/} Total fertility is the number of children the 'average' woman would bear during her reproductive life at the given age-specific rates above.

TABLE 2.

Sri Lanka: Proportions of Women Married in Different Age Groups and Average Age of Marriage, 1953, 1963, and 1970.*

Female Age Group	Percent Married in Year: ^{a/}			Percent Change 1953-1970
	1953	1963	1970	
15-19	24.3	15.3	8.4	-64.2
20-24	67.5	57.8	43.9	-35.0
25-29	87.2	82.7	77.1	-11.5
30-34	92.5	92.2	91.0	- 1.6
35-39	94.6	95.1	95.0	+ 0.4
40-44	95.0	95.8	97.2	+ 2.3
45-49	95.6	96.1	97.7	+ 2.2
Total (15-49)	74.7	69.0	60.7	-18.7

Average Marriage Age for Women (yrs.) ...	22.5	23.2	23.8	
Average Marriage Age for Men (yrs.)	--	27.8	28.1	

*Sources -- Dallas Fernando, "A Note on Differential Fertility in Sri Lanka," Demography, Vol. 11, No. 3, August, 1974.

Nicholas Wright, "Recent Fertility Changes in Ceylon and Prospects for the National Family Planning Program," Demography, Vol. 5, No. 2, May, 1968.

^{a/} includes women currently married, widowed, or divorced during or prior to the given year.

in the proportions of women married in the youngest age groups. Data showing these changes is presented in Table 2. The average marriage age increased 1.3 years between 1953 and 1970, while a dramatic reduction occurred in the percentage of women married between the ages 15-24.

Finally, and perhaps most importantly from the standpoint of Sri Lanka's demographic future, an overall decline in marital fertility took place during this period. Table 3 shows that the marital fertility rate for all age groups decreased by 13 percent from 1953 to 1970. The decline is most noticeable for older women and suggests that the childbearing years are now being concluded at a younger age, after which a degree of self-conscious family limitation is practiced. Surprisingly, however, a sharp increase in fertility occurred for the youngest married women. As will be shown in Part III, there is evidence that inverse relationships exist between fertility and both income and educational status in Sri Lanka. It seems likely that this apparent increase represents not so much a real change in fertility behavior as the fact with a much reduced percentage of women married at these ages, those who are marrying come from the lowest income and educational groups where fertility has traditionally been highest.^{2/}

Significantly, the trend to lowered fertility is taking place in both the urban and rural sectors of Sri Lanka. Fertility has historically been lowest in the urban areas, but the differential between the two is apparently narrowing (12, p. 441). Whereas in 1963 the ratio of rural to urban births was 1.19:1 per thousand women, by 1970 it had dropped to 1.11:1 (12, p. 445). During this period, the overall fertility decline in the rural sector was some 20 percent greater than that which occurred in the urban sector (12, p. 445).

In sum then, the rising age of marriage and the decline of marital fertility among older women have resulted in a significant drop in Sri Lanka's general fertility rate. Though the youngest couples appear to be having more children, their effect is far outweighed by the larger share who are postponing marriage, and a momentous decline in fertility for all young women regardless of marital status has occurred (Table 1). These demographic changes acted to lower Sri Lanka's birth rate from 38.7 per thousand in 1953 to 30.0 in 1971. Accordingly, the population's growth rate was slowed from 2.8 percent per annum to 2.2 percent (Chart 2).

Despite these notable trends, however, an annual growth rate of 2.2 percent is still quite rapid. A look at the age structure of Sri Lanka's population in Chart 3 gives some idea of what the demographic future holds. The effect of the fertility decline is apparent in the smaller portion of the population found in the 0-13 year age group in 1973 as compared to 1963. Nonetheless, with an age structure heavily weighted toward the young such as this, Sri Lanka's population will continue to grow almost regardless of anything that might happen to the birth rate in the near future. At the very least, the population will not attain a stable size until this preadolescent bulge ages past its reproductive years. It should be kept in mind that the demographic transition was not an overnight event in the West. Nor will it be such in Sri Lanka.

^{2/} Personal communication, A.T.P.L. Abeykoon, Statistical Officer, Sri Lanka Ministry of Planning and Economic Affairs.

TABLE 1.

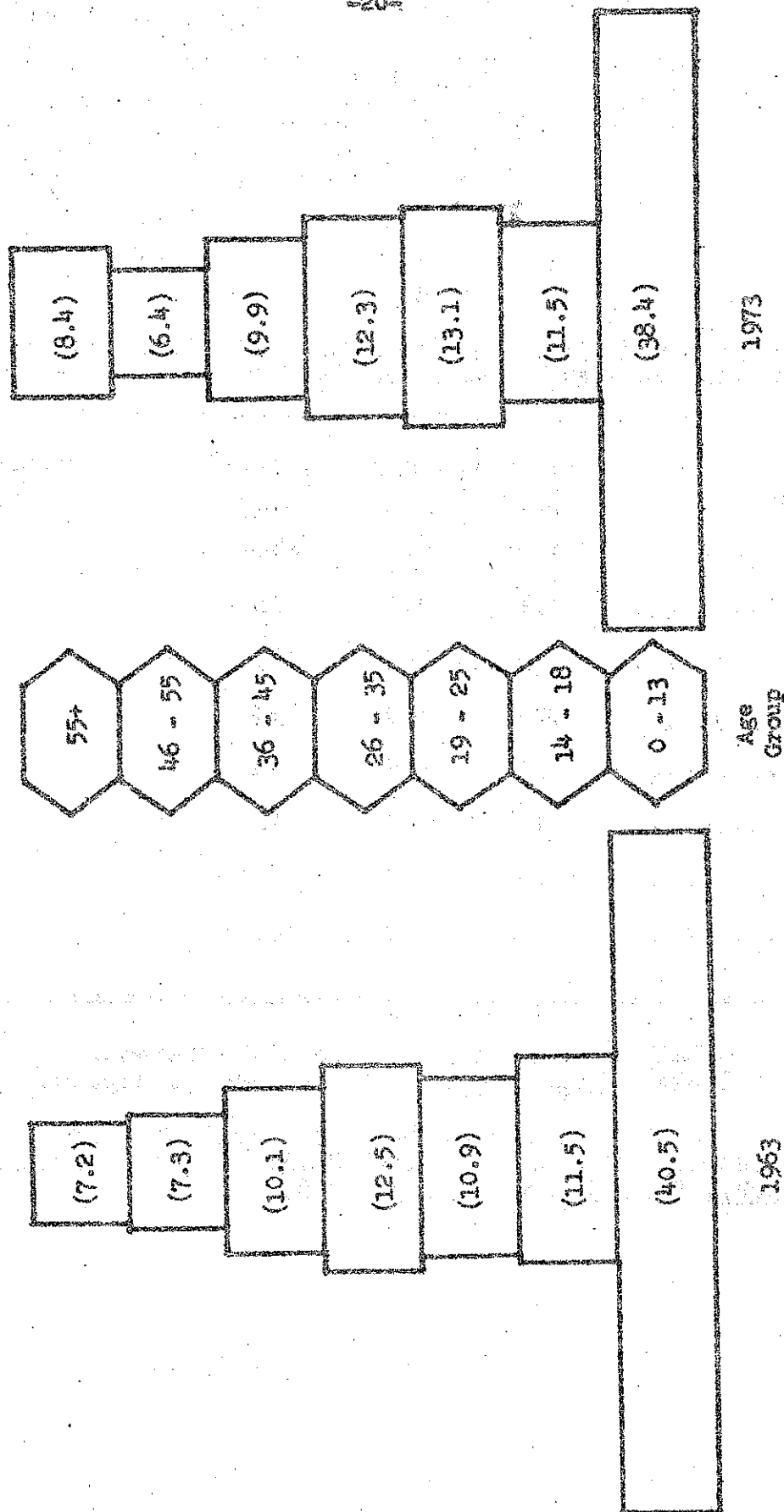
Sri Lanka: Age-Specific Marital Fertility Rates and Percentage Changes, 1953, 1963, and 1970.*

Female Age Group	Fertility Rate in Year:			Percent Change 1953-1970
	1953	1963	1970	
15-19	288	345	449	+55.9
20-24	394	397	408	+ 3.6
25-29	350	344	323	- 7.7
30-34	280	269	253	- 9.6
35-39	174	175	151	-13.2
40-44	47	53	42	-10.6
45-49	10	8	7	-30.0
Total (15-49).....	254	239	220	-13.4

*Sources -- Dallas Fernando, "A Note on Differential Fertility in Sri Lanka," Demography, Vol. 11, No. 3, August, 1974.

Nicholas Wright, "Recent Fertility Changes in Ceylon and Prospects for the National Family Planning Program," Demography, Vol. 5, No. 2, May, 1968.

CHART 3. SRI LANKA: POPULATION AGE DISTRIBUTIONS 1963 AND 1973
(figures in parentheses indicate percentages of total population)



Sources: Central Bank of Ceylon, 1963 and 1973 Surveys of Consumer Finances.

Part III -- The Roles Played by Urban-Industrial Development and
Rising Incomes in Sri Lanka's Fertility Decline

Demographic changes resulting in a fertility decline such as Sri Lanka's do not originate in a vacuum. The rising age of marriage and the declining birth rate indicate that basic notions concerning marriage and family are changing. Clearly, social and economic forces operating at the macro-level are in some way altering the status quo of human relations in Sri Lanka. We have seen that in the West, this process was set in motion by a transition of the economic structure of society, and hence a question arises: Are the economic factors -- namely, urban-industrial development and rising real incomes -- which affected fertility trends during the demographic transition of the West also at work in Sri Lanka? The discussion that follows indicates they are not.

Industrialization in Sri Lanka

Sri Lanka is not alone among developing nations in facing the constraints to industrial development set by international competition, and she is in addition hampered by internal obstacles to industrialization. The island has not been gifted with rich natural resources awaiting exploitation. Raw materials such as coal, oil, and essential minerals are lacking and hence must be imported from foreign sources (25, p. 221). Imports of these and capital goods are themselves limited by the serious balance of payments problem which exists. Despite government tax and credit incentives to promote investment, the small size of Sri Lanka's domestic market is an additional factor limiting the scope for large-scale industry (18, p. 16).

The slow growth of the industrial sector's share of Sri Lanka's Gross National Product was shown in Chart 1, but from the standpoint of the micro-level parental decisions affecting fertility behavior, industry's contributions to total employment and personal income are more relevant. It can be seen in Table 4 that the share of industry in these regards has been almost constant over the past two decades, consisting of about ten percent of employment and a similar portion of income. Agriculture, the major goods-producing sector of the economy, has also maintained constant shares. One frequently-used indicator of economic development in a country is that of a decreasing percentage of the labor force employed in agricultural activities. By this measure, Sri Lanka has made very little progress during the time that fertility has been declining.

Urbanization

Urbanization as it occurred in the West during the 1800's was a rational response to a pattern of economic opportunities which was shifting from a dispersed, agricultural base to one of a more concentrated, industrial nature. In many developing nations today, however, a migration to the cities is taking place that is due not so much to expanding urban opportunities as to an actual deterioration of economic conditions in the rural areas. On the one, agricultural development is in many countries a labor-displacing, capital-intensive process, and property relations are frequently such that landless laborers and tenant farmers can be ejected from the land they till as landlords opt for machinery which does not

TABLE 4.

Sri Lanka: Percentages of Total Income and Total Income Receivers Classified by Occupational Category.*

Occupation	1953		1963		1973	
	% of total income	% of total income receivers	% of total income	% of total income receivers	% of total income	% of total income receivers
Agriculture....	39.3	50.6	39.0	51.8	41.0	50.4
Industry ^{a/}	10.1	9.8	10.1	10.0	10.9	11.0
Commerce.....	11.0	4.0	12.6	8.0	10.6	6.9
Services.....	22.7	19.8	23.5	13.2	25.5	20.7
Transport and Communication..	9.2	4.0	6.3	4.6	5.9	4.1
All Others.....	7.7	11.8	8.5	12.4	1.3	1.3

* Note: The Central Bank categorized specific job types under different 'occupation' headings during different survey years. Hence, some erratic jumps in percentages result in the Services and All Others headings.

^{a/} includes heavy industry, mining, construction, manufacture, electricity and gas production, and handicrafts.

Sources --- Central Bank of Ceylon, Surveys of Consumer Finances for 1953, 1963, and 1973.

'talk back'. On the other hand, rapid population growth can result in such fragmented land holdings that peasant farmers simply cannot support themselves at even a subsistence level. The alternative in both cases is the same: a move to the cities, where the fortunate few find jobs while the remainder live in shanty towns or sleep on sidewalks.

By and large, Sri Lanka has been spared this experience. As Table 5 shows, the population remains overwhelmingly rural, with only 22 percent living in towns or cities. From the end of World War II until 1969, the urban share of the total population increased by only a percentage point. Much of this growth has been limited to the metropolitan Colombo area, where the bulk of the increase in the city-size category of 20,000 or greater has occurred (23, p. 208).

To be sure, the slow progress of the industrial sector has limited the growth of urban job opportunities. Much of the industrial and manufacturing expansion that did take place was dispersed and located near sources of raw materials, hence failing to provide single focusing points for urbanization (16, p. 54). In addition, the small size of the island and a well-developed, inexpensive transportation system allowed those seeking urban employment to move about easily without making a permanent migration to the cities (16, p. 61).

More importantly, however, forces at work in the rural sector itself prevented the deterioration of economic conditions which has caused a rural-to-urban exodus in other countries. The bulk of Sri Lanka's population is concentrated in the southwest area known as the Wet Zone. The remainder of the country -- the less humid Dry Zone -- is sparsely settled and in 1933, the government began a major effort to restore ancient irrigation works existing there and to colonize the area with small-scale peasant farmers. An outlet was thus created for the rapid population growth which occurred after World War II. In combination with various forms of communal land ownership which prevailed, this acted to forestall any significant fragmentation of land holdings (16, pp. 51-53 and 62).

Furthermore, a series of government policies served to ameliorate the situation of farmers throughout the island. In 1948, the Guaranteed Price Scheme was enacted in an attempt to provide incentives for increased production and assure satisfactory incomes for farmers. Originally applicable to paddy producers only, the Scheme was later extended to other crops. Under it, the government agreed to purchase all produce from farmers at prices typically higher than those of the open market. While opinion differs as to the Scheme's impact on production, it is generally felt that the guaranteed prices acted to bolster farmer incomes (2, p. 94; 11, pp. 142-145). In addition to price supports, land reform measures under the Paddy Lands Act of 1952 improved the position of tenant-farmers and helped Sri Lanka avoid the displacement of labor which had caused mass rural unemployment elsewhere (16, p. 57). Government policies in the areas of crop insurance, credit, and subsidies for fertilizer and other inputs all served to increase productivity in the rural sector. Finally, though unemployment was on the rise throughout the island during the 1960's, government food subsidies and health care measures acted to maintain the rural standard of living (16, p. 61). Each of these factors helps to explain the stability of the rural-urban population mix in Sri Lanka.

TABLE 1.

Sri Lanka: Percentage Share of the Urban Population in the Total Population, Selected Years.*

Town or City Size:	Percentage Share in Year:			
	<u>1946</u>	<u>1953</u>	<u>1961</u>	<u>1969</u>
20,000+	11.4	12.7	14.9	15.9
10,000+	15.4	17.0	18.6	19.7
5,000+	18.7	19.7	20.5	21.3
2,000+	20.5	21.1	21.5	22.1
Percentage share of total population in all towns including towns below 2,000	21.3	21.6	21.8	22.3

*Source -- Godfrey Gunatilleke, "The Rural-Urban Balance and Development - The Experience in Sri Lanka," Marga, Vol. 2, No. 1, 1973.

The Growth of Personal Income

From the above it would seem that urban-industrial development, the key motive force behind the demographic transition of the West, simply is not applicable in the Sri Lankan case. Moreover, development in the West was a broadly participatory process, yet in Sri Lanka, perhaps a sixth of the labor force is unemployed, indicating that many are not participating. Finally, it was in the urban-industrial areas of the West that the bulk of the fertility decline occurred, but we have seen that births are declining in the rural as well as the urban sector of Sri Lanka.

Development in the West was not important in and of itself, but rather because it was the source of rising incomes for the Western populations. This, in turn, gave them access to the improved standard of living which provided the stimulus for family limitation, i.e., an inverse relationship existed between income and fertility. Data presented in Table 6 indicates the same relationship is found in Sri Lanka. As household income increases, the average marriage age for women rises while completed family size decreases. This relationship holds across the major part of the income spectrum (98 percent of Sri Lankan households receive earnings of less than Rs. 1000 per month) and breaks down to a degree only at the highest income levels (7, p. 77).

Despite this relationship, however, the fertility decline in Sri Lanka has not been accompanied by any significant increase in personal incomes. Over the past two decades, the growth of national income averaged roughly 4.5 percent per year, but due to the rapidly expanding population, this growth on a per capita basis was diluted to something approaching two percent (8). Data from three Consumer Finance Surveys conducted by the government indicate the growth of median personal income has been even slower. In Table 7 it is shown that after being deflated by the Colombo Cost of Living Index (1953=100), the growth of real median income between 1953 and 1973 averaged a sluggish 0.82 percent per year. It seems unlikely that such a rate of growth is sufficient to account for the fertility decline which occurred during this period.

Table 6.

Sri Lanka: Relationships Between Income and the Pregnancy Rate, the Average Age of Marriage for Women, and the Average Size of Completed Family.*

Income Group (Rs. per mo.)	Pregnancy Rate ^{a/}	Average Age of Marriage for Women (years)	Average Size of Completed Family (number)
0-199	32.9	18.6	5.6
200-399	33.4	20.3	5.4
400-599	32.3	22.5	4.5
600-799	31.3	23.9	3.9
800-999	30.4	23.8	3.7
1000+	29.2	22.7	4.0

*Source -- C. E. R. Abhayaratne and C. H. S. Jayewardene, Fertility Trends in Ceylon, (Colombo, 1967).

^{a/} The Pregnancy Rate applies to married women and is the number of pregnancies which occur per 100 woman years of exposure to conception.

Table 7.

Sri Lanka: Changes in Median Income, 1953-1973.*

	1953	1963	1973
Median Nominal Income (Rs. per month)	338	385	622
Median Real Income (at 1953 prices)	338	353	394

Average Annual Real Income Growth, 1953-1973: 0.82%

*Sources -- Central Bank of Ceylon, Surveys of Consumer Finances for 1953, 1963, and 1973.

Part IV -- Development Denied?

Development in the West during the nineteenth century resulted in a changed physical environment favoring reduced mortality and a changed social environment favoring reduced fertility. The world today is a different place. Development is not a prerequisite to reduced mortality, and moreover, it is totally unnecessary. Could the same also be true for reduced fertility? Are there not certain preconditions to a lessening of fertility, preconditions which imply an improved standard of living but which nonetheless can be fulfilled without the development of an urban-industrial society and without the mechanism of rising incomes?

The Sri Lankan case suggests that there are. Government policies since World War II have to some extent resulted in the improved living standard that development generated in the West. This, in turn, seems to have set the stage for the fertility decline that has occurred over the past two decades. These policies have been alluded to in previous pages, but a more complete discussion of them and their possible impact on fertility behavior follows. It should be noted at the outset that linkages between these policies and fertility are, as yet, possible linkages only. To establish them as fact will require in-field surveys of parental attitudes, an undertaking that is beyond the scope of this paper.

Declining Mortality and the Effects of Health Care

The results of a number of research studies indicate that even in countries where fertility is high, the actual desired family size is generally small (1, p. 278; 13, pp. 219-236). High fertility is often a response to high mortality, and in traditional societies, cultural values can evolve over time which act to maintain high-fertility norms as a means of insuring the community's self-perpetuation (37, pp. 87-89). As mortality declines in such a society, the balance of the family vis-a-vis the resources available to it is upset. Increased survival of infants and the aged results in a greater dependency burden, while a growing family labor force puts pressure on the land, typically the chief economic asset controlled by the household. Under the continued impact of declining mortality in general and declining infant mortality in particular, a new demographic reality becomes recognized by potential parents: fewer births are needed to reach the desired family size. What is perhaps the major obstacle to a corresponding decline in fertility is thus overcome.

In analyzing the Sri Lankan demographic situation, R.K. Srivastava and A.T.P.L. Abeykoon wrote, "... there is a learning aspect to family formation and parental behavior should, with a time lag, adjust to the total societal experience of the changing demographic pattern" (35, p. 18). For Sri Lanka, they believe this time lag was 14 years in length, lasting from the initial sharp decline of infant mortality in 1946, until 1960, when the slow decline of fertility began to make itself felt (35, p. 18). The impact of this "changing demographic pattern" on parental attitudes cannot be separated from all the other social and economic factors which have combined to lower Sri Lanka's birth rate. Nonetheless, because of research indicating the small size of desired family, it seems reasonable to conclude that the well-established decline in infant mortality has inherently acted as a strong incentive for family limitation in Sri Lanka.

As discussed previously, government-provided health services have played a major role in the decline of both infant and overall mortality rates. Since 1947, per capita expenditure on medical care has increased three-fold, and health-related spending now comprises almost seven percent of the total government budget (1, p. 32; 22, p. 61). By the yardsticks of population per physician or hospital bed, Sri Lanka ranks highly among developing nations (22, pp. 56-57). The core of Sri Lankan medical care is a network of 98 'health units', each consisting of a central hospital plus outlying clinics and out-patient facilities. The units are evenly distributed throughout the island on the basis of population density. In addition to curative services, they provide preventive services in the areas of health education, maternal and child welfare, sanitation, and vaccinations. Much of the 1946 anti-malarial campaign was carried out under the supervision of the health units.

From day to day, however, the important function of these units is to furnish free medical care to any Sri Lankan who requires it. Close to 850,000 in-patients alone were treated in 1971, indicating how effectively the population is being served. In doing so, the health units provide a form of income in kind. For wealthier Sri Lankans, much medical care is still obtained from private sources, but for the poor who perhaps had traditionally been unable to afford such care at all, a substantial improvement in the level of living has resulted. The health services are also a major form of social security, and as such, they reduce the economic role of children as providers in old age. Thus for both direct and indirect reasons, the government's health care measures would appear to have had important implications for fertility trends in Sri Lanka.

The Food Subsidies

Sri Lanka is similar to most underdeveloped countries in that food represents the leading item in the average household budget. For the lowest income groups, fully 70 percent of total expenditure goes for food, while for all groups, the average is 55 percent (5, p. 103). Policies which affect food prices or availabilities can thus have a major impact on general welfare. For over two decades, the Sri Lankan government has subsidized the consumption of foods which make up some two-thirds of the typical diet (6, 1955-60 and 1968-72). Accounting for about one-quarter of current expenditure during the late 1960's, food subsidies comprise the largest single component of the government's budget (8, 1970).

The subsidies are an offshoot of food rationing schemes which were necessitated during World War II when the supply of food imports was interrupted. In the inflationary post-war years, it became apparent that the lower income groups had to be protected against rapidly rising prices for basic imported consumption goods. This was particularly important in the case of rice, which constituted about 18 percent of total expenditure in the average household budget during this time (3, Table 26). The ration plan which had existed throughout the war years was therefore continued, with every Sri Lankan receiving a weekly allotment of rice at a government-controlled price. Over the years, the scheme became a more or less permanent fixture, and today each citizen over one year of age is entitled to a free measure (two pounds) of rice weekly, with a second provided at a low, subsidized rate. The scheme has also been expanded to include wheat flour, sugar, and certain minor food items (onions, salted fish, and

condiments), which are made available at controlled prices. Technically, the subsidies are intended to apply only to the non-taxpaying lower income groups, but this apparently is not enforced, so the vast majority of the population benefits.

Food balance sheet data presented in Table 8 illustrates the pre-eminent dietary role played by foods provided under the subsidies. The Sri Lankan diet is heavily dependent on starchy staples for both energy and protein needs. Rice alone accounted for 44 percent of available calories and roughly one-half of all protein during the two time periods examined. The data also indicate that per capita food availabilities have remained fairly constant over the years. T. Jogaratnam and T.T. Poleman adjusted the crude balance sheet averages for 1955-60 up somewhat for calories and down slightly for protein (21, pp. 35-36). It is difficult to determine how adjustments might be made to the 1968-72 figures, as the composition of foods in the diet has changed over time. Given the numerous opportunities for error in the balance sheet method of food accounting, the only safe conclusion one can reach is that no significant change in caloric and protein availabilities has occurred during this period. The average Sri Lankan diet apparently was and is adequate by Food and Agriculture Organization (FAO) standards for Sri Lankan conditions (1930 calories required per day, with protein adequacy arising from caloric adequacy) (21, p. 32).

Variations around this mean are shown in Chart 5. Data here were compiled from the Socio-Economic Survey of Ceylon, 1969/70, and hence calorie and protein averages differ somewhat from those of the food balance sheets in Table 6. It is apparent that the FAO calorie requirements are being exceeded by households in all income groups in terms of per capita availabilities. If the FAO's standard 15 percent allowance for waste between purchase and actual consumption is applicable, however, this surplus becomes a 100-calorie deficit for that 44 percent of Sri Lanka's households which make up the lowest income group (Rs. 0-200 per month) (7, p. 50; 31, p. 8). While evidence of protein-calorie malnourishment and vitamin deficiencies can be found in Sri Lanka, particularly among the urban poor, the general consensus is that no serious nutritional problems exist for the population as a whole (21, pp. 36-37; 29, pp. 103-104). It would seem that the FAO's 15 percent factor overstates actual wastage on the part of Sri Lanka's poorer citizens (29, p. 93).

The government's food subsidies play a major part in this apparent dietary adequacy. The direct consumption effect of the free rice ration alone can be seen in Table 9. For Sri Lankans overall, the free ration supplies over 18 percent of all calories, with the greatest benefit accruing to the lowest income groups. In addition to consumption effects, the food subsidies also have important income effects, and these are illustrated in Table 10. Roughly 80 percent of Sri Lanka's households receive earnings of less than Rs. 400 per month, and for this group as a whole, the subsidies represent 14-15 percent of their total income. Moreover, the portion of income represented by the subsidies has been increasing over time. While in 1973 they amounted to an average of 8.5 percent of income for all groups, the figure for 1963 was only 4.1 percent (4, p. 112). This is particularly important when it is considered that the Colombo Cost of Living Index -- which is largely determined by food prices -- has been rising steadily since the late 1960's (8, 1973). The food subsidies have thus acted to maintain levels of consumption for

Table 8.

Sri Lanka: Food Balance Sheet Estimates, 1955-60 and 1968-72 Averages (per capita per day).*

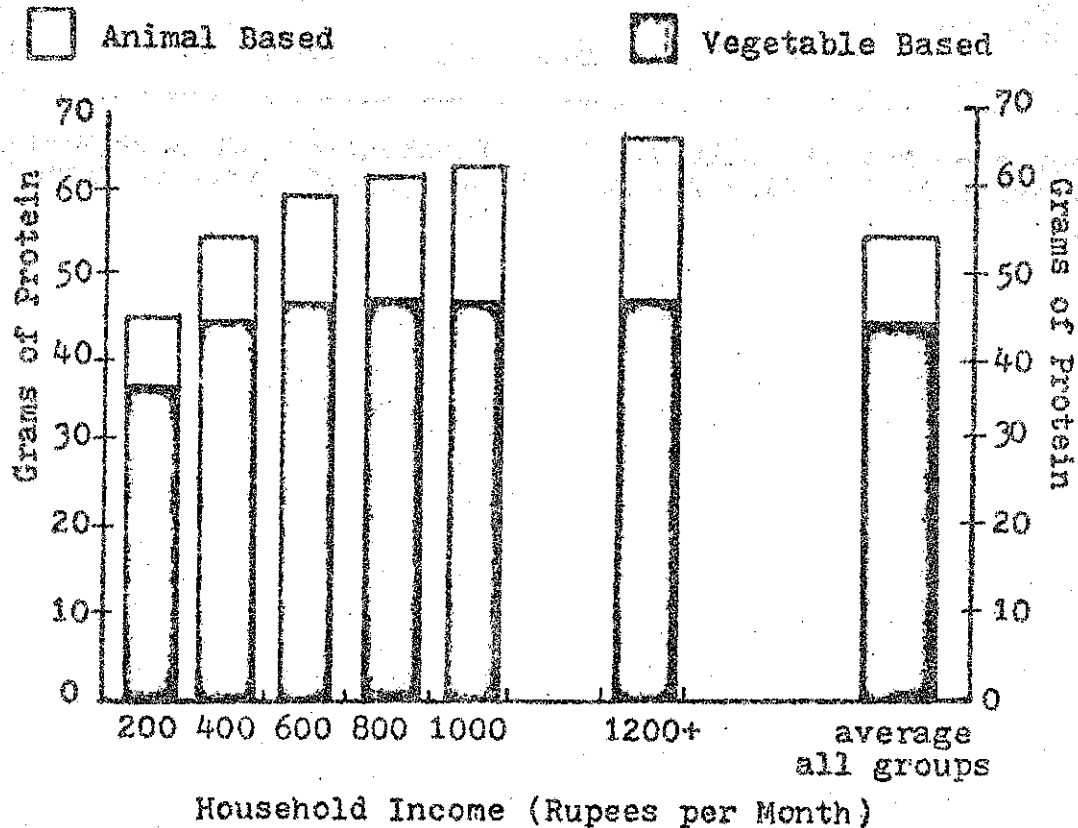
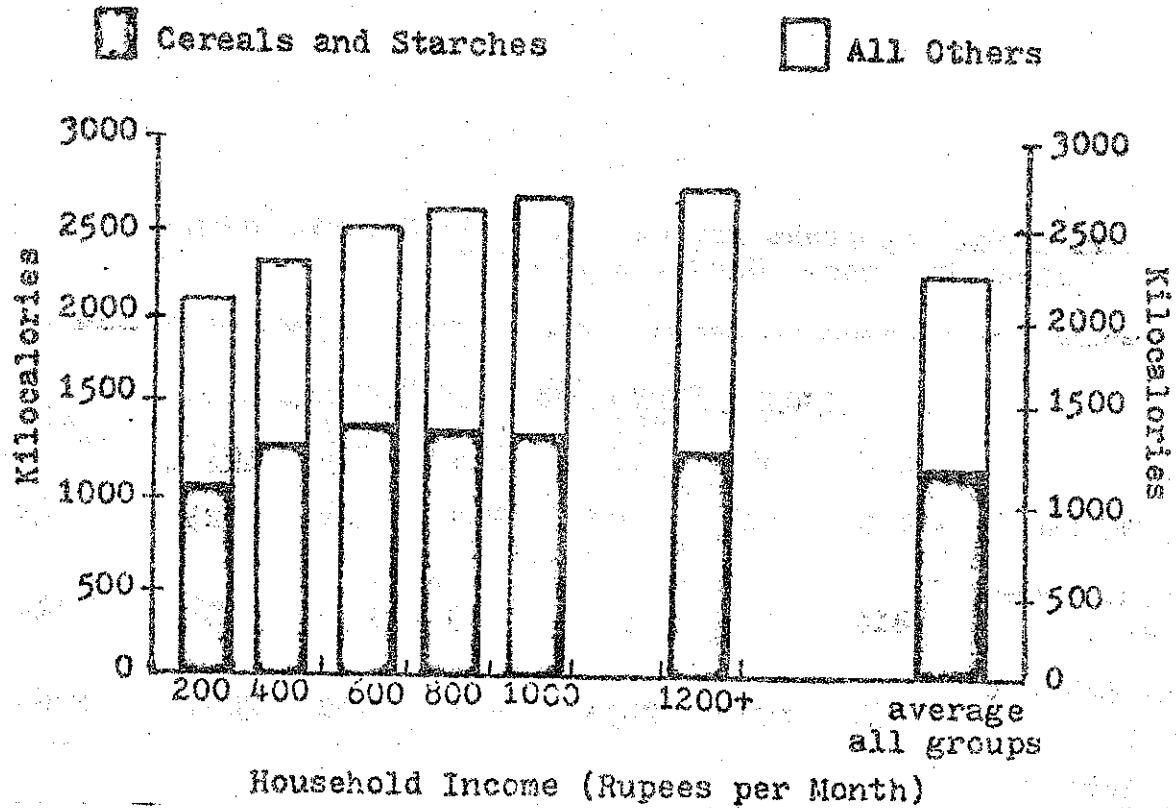
Commodity	1955-60 ^{a/}		1968-72 ^{b/}	
	Calories	Grams Protein	Calories	Grams Protein
Cereals	1200	22.6	1282	28.2
rice	950	16.3	986	19.2
wheat	223	6.0	273	8.3
others	27	0.3	23	0.7
Roots and Tubers	74	0.6	88	0.7
Sugar	190	0.0	232	0.0
Pulses	58	12.7	380	6.6
Vegetables	28	1.7	43	2.4
Fruits	9	0.1	18	0.2
Meat	12	0.8	7	0.9
Fish	60	7.1	46	6.8
Eggs	4	0.3	9	0.7
Milk	13	0.7	40	1.8
Fats and Oils ..	477	0.7	95	0.1
Totals	2125	47.3	2240	48.4
Portion of protein from animal sources		18%		21%

*Sources -- a/ adjusted food balance sheet estimates from T. Joga-ratnam and T. T. Poleman, Food in the Economy of Ceylon, Cornell Int. Agric. Bull. No. 11, October, 1969.

b/ unadjusted estimates from Ceylon Dept. of Census and Statistics, Food Balance Sheets for years 1968-1972.

Chart 5.

Sri Lanka: Apparent Per Capita Daily Energy and Protein Availabilities by Income Groups, 1969/70.*



*Source -- T.T. Poleman, "Income and Food Consumption: Report to the Government of Sri Lanka," FAO/UNDP, No. TA 3198, Rome, 1973.

Table 9.

Sri Lanka: Apparent Per Capita Daily Caloric Intake From Rice, by Income Group, 1969/70.*

	Income Group (Rs. per Month)						All Groups
	0 to 200	200-399	400-599	600-799	800-999	1000+	
Free Ration	430	424	403	393	368	323	417
Outside Free Ration	416	515	591	593	617	597	500
Total Caloric Intake	2064	2272	2436	2512	2540	2641	2264
Free Ration as a % of Total Caloric Intake	20.8	18.7	16.6	15.6	14.5	12.2	18.4

Source -- Neville Edirisinghe, "Implications of Government Intervention in the Rice Economy of Sri Lanka" (thesis, Cornell Univ., 1975).

TABLE 10

Sri Lanka: Subsidies on Rice, Wheat Flour, and Sugar as a Percentage of Total Income Per Spending Unit for Different Income Groups, 1973.

Income Group (Rs. per two mo.)	Average Income Without Subsidies (Rs. cts.)	RICE Subsidy on Free Measure	WHEAT FLOUR Subsidy	SUGAR Subsidy on Ration	Total Subsidy ^{a/}	Total Taxes ^{b/} Incurred	Average Income With Subsidies	Subsidies as a Percentage of Total Income
0-50	30.34	3.52	1.00	1.71	6.23	1.13	36.57	17.1
51-100	74.15	9.36	1.69	3.07	14.12	0.47	88.27	16.0
101-200	144.84	13.78	3.41	3.51	20.70	0.94	164.94	12.6
201-400	278.94	28.55	8.73	6.84	44.12	2.27	323.06	13.6
401-800	521.41	39.94	12.10	9.89	61.93	3.38	583.35	10.6
801-1600	1006.04	43.81	10.76	12.12	66.69	4.91	1072.73	6.2
1601+	2462.00	22.85	9.45	9.30	42.46	6.26	2582.60	1.9
Average	583.53	35.00	10.24	8.91	54.19	3.27	637.68	8.5

Source --- Central Bank of Ceylon, 1973 Survey of Consumer Finances.

a/ Household income is strongly related to family size in Sri Lanka. Hence, the increase in the total subsidy as income increases reflects a greater number of family members (including servants) drawing the ration, and not greater per capita benefits.

b/ Includes taxes on the second weekly measure of rice and off-ration sugar purchases.

the unemployed and those whose incomes have not increased correspondingly. One can safely conclude that without the subsidies, the dietary situation for many Sri Lankans would be quite different.

It is possible that the food subsidies have had two consequences for fertility trends in Sri Lanka. On the one hand, the subsidies are an important form of social security. Every week, Sri Lankans are assured of getting a significant portion of their food supplied either for free or at low, stable prices. For the elderly poor, this is a service traditionally rendered by children, and thus the effect of the subsidies is to decrease the need for children as providers in old age.

More importantly, however, the food subsidies represent an increase in real income. Insofar as cash income is freed for non-food purposes, the subsidies contribute to a rising level of living. For poorer Sri Lankans, though, increments of income would more likely be spent on food. The marginally adequate diet depicted in Chart 5 for that 44 percent of Sri Lankan households which constitute the lowest income group is a significant function of the food subsidies. To the extent food intake has been increased among the poor, improved levels of nutrition and health have resulted. That these events have in fact taken place is reflected by the mortality decline in general, and the decline of infant mortality in particular. Through their impact on the infant mortality rate, the food subsidies have helped to fulfill what is perhaps the most essential precondition to a decline in fertility.

Education^{1/}

Since 1952, government policy in Sri Lanka has provided for free education from primary to university levels. Government expenditure on education is typically equivalent to over 4.5 percent of the total Gross National Product, ranking it among the highest in Asia (22, p. 94). Educational facilities are distributed in such a manner that educational levels are very low for the 11 percent of the population living in the estate sector (5, pp. 29-31; 7, p. 1). Despite this, however, overall rates of literacy and educational attainment are considerably higher in Sri Lanka than for most developing nations and have been rising steadily over time. Whereas in 1953 overall literacy was 64 percent, in 1969 it had been increased to 83 percent (7, p. 8; 34, p. 318). Currently, over 80 percent of Sri Lankan youths receive a primary education and almost 40 percent are still students between the ages of 15 and 24, comprising the secondary school and college population (7, p. 13).

A strong relationship exists between educational attainment and income in Sri Lanka (5, p. 79). In spite of the unemployment problem of the educated young, those who finally find work will earn more than they would otherwise. Because of this, parents are strongly motivated to have their children educated in order to improve the family's social status. This indicates that parents see the long-run benefits of education to be greater than the short-run gains to be had from keeping children out of school and working at home.

^{1/} The following discussion benefited greatly from personal communications with A.T.P.L. Abeykoon, op cit.

Significantly, education of the sexes has become more equal over time. In 1953, 69 percent of males and 53 percent of females received at least a primary education, but in 1969, the respective figures were 88 and 77 percent (3, Table 6; 7, p. 13). Over the past thirty years, it has become the norm rather than the exception for women to receive an education and increasingly they desire to work for a few years before marrying. In all sectors of Sri Lanka, women typically earn wages considerably below those paid to men for the same work. As educational and occupation-skill levels increase, however, these differentials tend to decrease. As a result of both this and the direct relationship between education and income, women have become more inclined to remain in school as long as possible in the hopes of finding white-collar jobs where wages will be greatest. At the present time, women account for one-half of all university students and more than one-half of all medical students. This trend persists despite the greater unemployment which exists for educated women as compared to men.

For the Sri Lankan population as a whole, one effect of this increased education has been to lower fertility indirectly by increasing the average marriage age. O.E.R. Abhayaratne and C.H.S. Jayawardene have found the age of marriage for females to be directly related to the levels of both their own and their husbands' education (1, p. 301). On the one hand, this reflects the fact that marriage in Sri Lanka is usually delayed until the husband has secured employment, and this generally occurs only after his education is completed (12, p. 452). To this extent, it is possible that Sri Lanka's unemployment problem is contributing to the fertility decline because of the long wait an educated young man often faces before finding a job (12, p. 453). More important, however, has been the increasing education of women coupled with their greater participation in the labor force. Insofar as women are in school or working, they are not marrying and reproducing. This trend represents a fundamental change for a society where women have traditionally been housewives only.

A second and more direct consequence of rising educational levels is one that appears to be inherent to the process of education itself. The numerous welfare measures which the government provides for its citizens have all acted to reduce the cost of raising children in Sri Lanka: before and after birth they receive free medical care, after one year of age much of their food is supplied for free, and when the time comes, their education is free. Hence, one could logically expect an increase in fertility to have resulted, but this did not occur. A body of research undertaken in other countries indicates that there is an inverse relationship between education and fertility, yet the precise psychological effect that education has on the individual eludes definition. That this relationship is operating in Sri Lanka is indicated in Table 11. For women in every age group and regardless of whether employed or not, fertility decreases as the level of education increases. A reasonable, if tentative, conclusion to reach is that education in Sri Lanka has served to make potential parents cognizant of the advantages of smaller families, and hence has played an important role in the overall decline of fertility.

Income and Social Security Schemes

Several factors operating in Sri Lanka serve to stabilize incomes and employment for the wage-earning component of the labor force. Unions

Table 11.

Sri Lanka: Average Number of Children Born to Married Women
According to Age and Educational Status, 1974.*

Age Group	No School	Grade		Passed "O" Level	Beyond "O" Level
		1-4	5-9		
15-19	0.63	0.62	0.53	0.38	---
20-24	1.68	1.63	1.37	0.94	0.52
25-29	3.10	3.08	2.48	1.58	0.94
30-34	4.46	4.43	3.66	2.41	1.86
35-39	5.70	5.45	4.59	3.22	2.56
40-44	5.97	5.69	5.08	3.59	3.10
45-49	6.03	5.79	5.08	4.09	3.24

*Source -- Ceylon Dept. of Census and Statistics, The Population of Sri Lanka, (Colombo, 1974).

and wage boards establish minimum pay rates and working conditions for well over one million employees in numerous industries (20, p. 58). With the notable exception of the estate laborers who comprise perhaps a third of this total, wages in these industries generally kept slightly ahead of inflation during the 1960's (20, pp. 47-51). Moreover, minimum wages for unskilled workers rose faster than for skilled workers during the decade (20, p. 55).

In addition, government laws in effect since 1957 dictate the conditions under which individual or large-scale retrenchments of workers can be made. Though not always enforced, an employer wishing to dismiss employees is supposed to submit to a labor tribunal at which an arbitrator is empowered to either order reinstatement or set the terms of ex gratia payments. In the opinion of many employers, these tribunals tend to favor the employee even when legitimate grounds for dismissal exist (20, p. 68). Furthermore, in industries where union activity is strong, employers are often deterred from making dismissals by the danger of inciting strikes or other such tactics (20, p. 70). The result of these factors is a good measure of job security for the workman on the one hand, but a disincentive for employers to maintain more than a minimum work force on the other (19, p. 128).

The above measures act in tandem with the land reform, price support, and input subsidy schemes benefiting farmers to stabilize employment and incomes for much of Sri Lanka's economically active population. Given the island's unemployment problem, it is not surprising that job security is a prime concern of those in or about to enter the labor force (19, p. 20; 20, p. 148). Income is the key to a better standard of living, and when parents are assured of steady jobs, they can afford to be less concerned with producing children as supplementary income earners.

The economic utility of children is further reduced by an array of retirement and social security schemes which the government has instituted. The Employees' Provident Fund collects contributions from both employee and employer which are repaid upon the worker's retirement. Established in 1958, the Fund currently covers all urban and agricultural firms employing wage labor. Various workmen's compensation plans have been in effect since as early as 1934 to make payments in the event of the work-related injury or death of an employee. The payments appear to be quite generous, amounting to a large percentage of normal wages in the event of injury and the equivalent of several years' full pay when total disablement or death occur (20, p. 78). As of 1971, some 550,000 urban and rural workers were covered by these plans (20, p. 78). In addition, there are numerous minor schemes which provide pensions for particular occupational groups. Besides safeguarding the welfare of workers and their families, each of these schemes acts to reduce the traditional role of children as providers in their parents' old age. In doing so, they are just one more stimulus for reduced fertility in Sri Lanka.

The National Family Planning Program

An official family planning program has been in effect in Sri Lanka since 1965. The program operates through the maternal and child welfare stations of the government health units, where advice and contraceptives are provided by specially trained personnel. Unfortunately, however, for cultural and political reasons, official interest in the program appears

to be somewhat half-hearted (19, p. 45; 20, p. 220). As of 1971, family planning services were available in only 40 percent of the island's health units, and the program is administered in complete isolation from the pre- and post-natal activities of these centers (10, p. 121).

While the program as a whole has achieved notable success, it has not been sufficient to account for much of the fertility decline which has occurred. In 1966, it was estimated that the program would have to enlist 110,000 new acceptors per year in order to reduce the birth rate to the target level of 25 per thousand by 1975 (20, p. 220). Despite the fact that there were only about half that number of acceptors each year, the birth rate has apparently fallen to very near the target level, indicating that a good deal of family planning is being practiced outside the program.^{2/}

Nonetheless, that some 55,000 acceptors have been reached annually by the program is significant. It must be kept in mind, however, that these were volunteers, not recruits. They did not come in response to exhortations, but instead because of personal decisions concerning the desirability of family limitation. The success the program has had indicates that the basic social and economic preconditions to a reduction in fertility are being met in Sri Lanka. In the future, as the trend toward smaller families continues to gain momentum, perhaps a greater role can be played by family planning services.

Summary and Conclusions

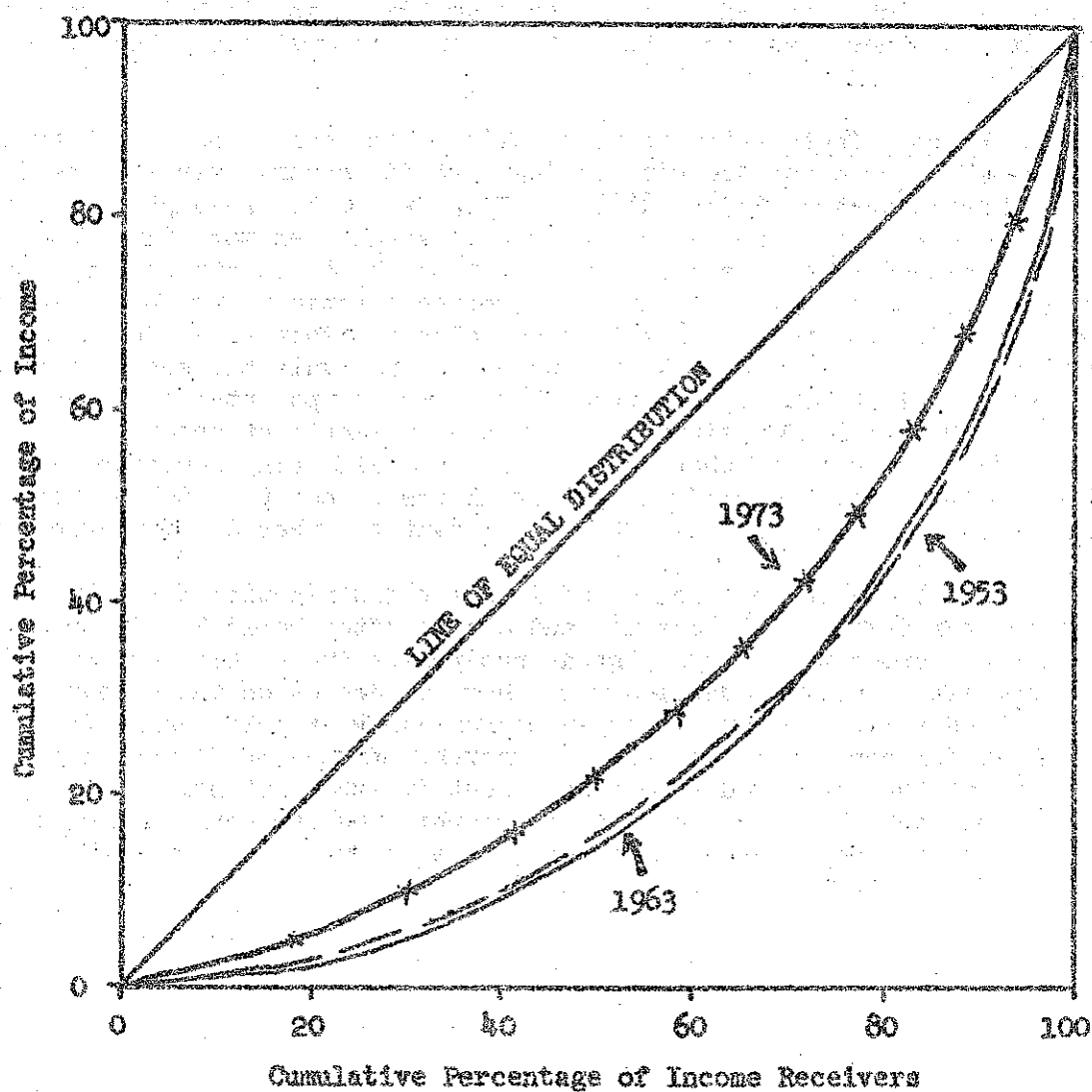
Government social welfare and income support policies have effected a significant improvement in the level of living for a large part of Sri Lanka's population. Chart 6 shows that as a result of these policies and a progressive tax structure, a substantial redistribution of income occurred between 1963 and 1973. Nonetheless, the government's measures have been costly. To the extent investment has been ignored in favor of maintaining the welfare floor, overall development has been slowed.

The results of this study indicate that economic development has not been a prerequisite to the demographic transition in Sri Lanka. Technological and social advances are responsible for much of the mortality decline which has taken place since World War II. Fertility has declined despite the slow growth of both the urban-industrial sector and the personal incomes of the population as a whole. Moreover, the decline of rural fertility indicates that urban areas need not be the seat of the demographic transition's final stage.

Three basic factors are commonly identified as being preconditions to reduced fertility. They include: a reduced level of infant mortality, increased education and new social roles for women, and a reduction in the economic utility of children. We have seen that economic development fulfilled these preconditions in the West. With the possible exception of the latter, they have been fulfilled in Sri Lanka as a result of various government policies. The anti-malarial campaign, health services, and food subsidies have directly influenced the infant mortality rate. Greater edu-

^{2/} Personal communication, A.T.P.L. Abeykoon, op cit.

CHART 6 SRI LANKA: LORENZ CURVE FOR INCOME RECEIVERS,^{a/}
1953, 1963, AND 1973 *



*Source: Central Bank of Ceylon, Survey of Consumer Finances for 1953, 1963, and 1973.

^{a/} includes income in kind from food subsidies.

cation for women has acted to increase the age at which they marry, and has allowed increasing numbers to move into the labor force and away from more traditional roles. These policies have reduced the costs of rearing children, but they have also reduced the need for them as providers in old age. To the extent that children are in school, they are not earning income for the household, and the fact that the vast majority do receive an education indicates that parents increasingly see the child as an investment rather than an asset to be exploited. The trend toward declining marital fertility among older women is evidence that family limitation is being practiced despite any incentives for childbearing that the welfare policies might provide.

Ex post facto attempts to associate the decline of fertility in various Western countries with a single socio-economic variable have not proven satisfactory (37, p. 88). Hence it would be presumptuous to speculate as to which of the government policies has been most important. Rather, their combined effect seems to have been to create an atmosphere conducive to lowered fertility. Only direct government actions have been examined, thus ignoring the possibility that sociological factors unique to Sri Lanka have also been operating. It is suggested that valuable supplementary research could be undertaken through a survey of parental attitudes in Sri Lanka. The Sri Lankan situation presents an excellent opportunity to study attitudinal changes as they are evolving and affecting demographic trends. The results of such a study might reveal the extent to which the mix of government policies in Sri Lanka is relevant to other developing countries.

Sri Lanka chose a policy of income redistribution for political rather than demographic reasons, and did so after World War II at a time when the economy was enjoying great prosperity due to high export prices and earnings. Other countries would have to decide on the extent to which such a redistribution is either an economically or politically feasible strategy for controlling population growth. In the Sri Lankan case, one wonders whether a more development-oriented, labor-intensive strategy might not have produced the same demographic results with both equity and a more satisfactory rate of growth for the economy.

Citations

- 1 O.E.R. Abhayaratne and C.H.S. Jayawardene, Fertility Trends in Ceylon (Colombo, 1967).
- 2 P.C. Bansil, Ceylon Agriculture: A Perspective, (Colombo, 1971).
- 3 Ceylon, Central Bank, Survey of Ceylon's Consumer Finances, 1953.
- 4 Ceylon, Central Bank, Survey of Ceylon's Consumer Finances, 1963.
- 5 Ceylon, Central Bank, Survey of Ceylon's Consumer Finances, 1973.
- 6 Ceylon, Dept. Cens. Stat., Food Balance Sheets, 1968-1972.
- 7 Ceylon, Dept. Cens. Stat., Preliminary Report on the Socio-Economic Survey of Ceylon, 1969/70.
- 8 Ceylon, Dept. Cens. Stat., Statistical Abstracts of Ceylon, (selected years).
- 9 Ceylon, Min. Agr. and Food, Agricultural Development Proposals, 1966-1970.
- 10 Ceylon, Min. Plan. and Employ., Five Year Plan: 1972-76.
- 11 Neville Edirisinghe, "Implications of Government Intervention in the Rice Economy of Sri Lanka" (thesis, Cornell Univ., 1975).
- 12 Dallas Fernando, "A Note on Differential Fertility in Sri Lanka," Demography, August, 1974.
- 13 R. Fridan, "Fertility Trends in Taiwan: Tradition and Change," Population Studies, March, 1963.
- 14 H. Gille, "The Demographic History of Northern European Countries in the Eighteenth Century," Population Studies, June, 1949.
- 15 C. Goldscheider, Population, Modernization, and Social Structure, (Boston, 1971).
- 16 G. Gunatileke, "The Rural-Urban Balance and Development -- The Experience in Sri Lanka," Marga (Colombo, Sri Lanka), Vol. 2, No. 1, 1973.
- 17 H.J. Habakkuk, "English Population in the Eighteenth Century," Population in History, D.V. Glass and D.E.C. Eversley eds., (London, 1965).
- 18 International Bank for Reconstruction and Development, Recent Economic Trends in Ceylon, (1966).
- 19 International Labor Office, Matching Employment Opportunities and Expectations -- A Programme of Action for Ceylon: Report, (1971).

20 International Labor Office, Matching Employment Opportunities and Expectations -- A Programme of Action for Ceylon: Technical Papers, (1971).

21 T. Jogaratnam and T.T. Poleman, Food in the Economy of Ceylon, (Cornell Univ. Int'l. Agr. Dev. Bull. No. 11, October, 1969).

22 G.W. Jones and S. Selvaratnam, Population Growth and Economic Development in Ceylon, (Colombo, 1972).

23 G.W. Jones and S. Selvaratnam, "Urbanization in Ceylon, 1946-1963," Modern Ceylonese Studies (Colombo, Sri Lanka), July, 1970.

24 H.N.S. Karunatilake, "Changes in Income Distribution in Sri Lanka," Central Bank Staff Studies (Colombo, Sri Lanka), April, 1974.

25 H.N.S. Karunatilake, Economic Development in Ceylon, (New York, 1971).

26 Kerala, State Plan. Board, Kerala: An Economic Review, 1971.

27 T. McKeown and R.G. Brown, "Medical Evidence Related to English Population Changes in the Eighteenth Century," Population in History, D.V. Glass and D.E.C. Eversley eds., (London, 1965).

28 New York Times, October 20, 1974.

29 L.N. Perera, W.S.M. Fernando, B.V. De Mel, and T.T. Poleman, "The Effect of Income on Food Habits in Ceylon," Marga (Colombo, Sri Lanka), Vol. 2, No. 1, 1973.

30 W. Petersen, Population, (New York, 1961).

31 T.T. Poleman, World Food: A Perspective, (Cornell Univ. Int'l. Agr. Reprint No. 59, July, 1975).

32 W. Rasaputram, "Changes in the Pattern of Income Inequality in Ceylon," Marga (Colombo, Sri Lanka), Vol. 1, No. 4, 1972.

33 S. Scherr, "The Mexican Development Strategy: Retrospect and Prospect," Cornell Agr. Econ. Staff Paper No. 75-28, December, 1975.

34 D.R. Snodgrass, Ceylon: An Export Economy in Transition, (Homewood, Illinois, 1966).

35 R.K. Srivastava and A.T.P.L. Abeykoon, "The Demographic Situation in Sri Lanka," Sri Lanka Labor Gazette (Colombo, Sri Lanka), July, 1974.

36 A. Thiagarajah, The Economic Development of Ceylon (With Special Reference to Industrialization), (Colombo, 1966).

37 United Nations Publications, The Determinants and Consequences of Population Trends: A Summary of Recent Findings, (New York, 1973).