1. A CONCEPTUAL FRAMEWORK FOR DEVELOPMENT PLANNING

In order to place the methodology of this volume in a proper perspective, this chapter describes a conceptual framework for comprehensive development planning involving demographic variables. 1/ The framework is intended to show how the standard of living of different population groups can be determined by the working of the economic system and population dynamics, and their interactions under alternative strategy or policy scenarios. In particular, the chapter should provide a conceptual apparatus, or a "mental model" that can help the planner to better understand how different policies and structural reforms, operating through economic growth, population change or income re-distribution, can improve standards of living.

The chapter first presents an overview of the framework and then discusses the principal institutions distinguished in the framework. Further, major variables and interrelationships of the framework are examined, first from the static and then from the dynamic point of view. Finally, key economic-demographic interactions are considered.

A. Overview of the framework

The framework is based on the assumption that a primary objective of "social and economic development is the attainment of higher standards of living for all, but particularly the poor members of the society" (Pyatt and Thorbecke, 1976). In view of this, the framework brings together those economic and demographic variables that appear to have a crucial bearing on the well-being of various population groups. It is concerned with economic growth, population dynamics and income generation and distribution, as well as with the way these interact and impact on the standard of living of socio-economic groups.

The major elements of the framework include the supply of and the demand for both commodities and factors of production, plus the creation and distribution of incomes among population groups and other institutions (corporations and government). Other elements of the framework include the components of population change and the resultant demographic characteristics of population groups, as well as a variety of major economic-demographic interrelationships. Also, the framework embodies various policy instruments and structural reforms that planners and policy makers may utilize to influence economic performance, population dynamics and income generation and distribution.

In the framework, the standard of living of any particular group is visualized as a function of the average level of consumption enjoyed by the group. In this context, consumption consists of two major components, one of which is goods and services purchased or produced by the group for own consumption. The other consists of goods and services provided by government.

Policy instruments and structural reforms which the planner can use as part of a strategy include factor prices, taxes and transfers, or land and educational reforms. The policy instruments, such as family planning programmes or resettlement schemes may act on various components of population change. But, in order to formulate specific policies or strategies, the planner would have to operationalize the framework by performing numerical policy and strategy experiments.

A number of the variables of the framework need to be disaggregated for the framework to produce the most effective results. Thus, the population or the "household sector" ought to be subdivided into socio-economic groups. Further, in order to link the standards of living at the group level to the performance of the various segments of economy, other principle variables should be disaggregated. Thus, production as well as inputs to production should be disaggregated along dimensions such as economic sectors, location (urban/rural), and/or form of organization (modern/informal). Similarly, incomes and consumption should be subdivided by socio-economic group and, further, by source of income and commodity category, respectively.

B. Institutions

The framework distinguishes three categories of institutions: population groups, corporations and government. 2/ Each population group is treated as a separate institution. Corporations and government are each considered as one institution. These various institutions play distinct roles in the development process which in turn influences the performance of the economic system and, ultimately, the well-being of the population groups.

The number of socio-economic groups may vary from one country to another. In principle, the disaggregation of the population should yield groups that are susceptible to the effects of specific policies designed to influence their living standards. The groups, however, should consist of households having similar standards of living, similar levels of asset ownership and/or the same residential location. Where appropriate, they may consist of households having the same caste, ethnicity and/or religion. In view of this, defining socio-economic groups for a particular country may often necessitate disaggregating the national population by urban-rural location and within each location along one or two additional dimensions. For example, in the urban areas, it may be necessary to make a distinction between groups of households associated with modern and informal sectors. In the rural areas, a useful distinction could be between landless and small-farm households.

The use of the framework in planning requires that individual population groups be tracked over time. However, it is often difficult to formulate sound assumptions on the population transfers among the groups. Therefore, in many applications of the framework to medium-term and especially long-term planning, it will prove necessary to keep the number of groups small, although this would mean working with groups that are rather heterogeneous.

C. Principal variables

This section will first consider the statics (box 8) of the framework by stressing the accounting relationships of the system and the variables linked by them. Then, the dynamics of the system will be discussed by considering how it changes over time.

1. Statics

At any point in time, the system possesses internal consistency. Starting at any point in the system and moving through it, one returns to the same initial point. In this discussion, disposable incomes of various institutions, which are the end result of the process of income distribution among the institutions, are such a starting point. They begin a chain of linkages running from incomes to demand, from demand to production and all the way back to incomes.

(a) Disposable incomes

The disposable incomes of population groups consist of incomes (net of taxes) received from various sources. The groups typically spend portions of their disposable incomes on goods and services. This gives rise to household consumption demand which, in the aggregate, represents a major part of the total final demand. The rest of household disposable incomes are household savings which make possible investments of various sorts, such as those relating to housing and family businesses. These investment activities lead to household investment demand.

The corporate disposable income includes earnings retained by the corporations after making payments of dividends and taxes to population groups and government, respectively. This income, which represents gross business savings (box 9) of the corporations enables them to make investments into new facilities as well as to replace a part of the existing facilities. In the process of making those investments the corporations create corporate investment demand.

Government disposable income is comprised of revenues collected through direct and indirect taxes net of government transfer payments to population groups and corporations. A part of this income is earmarked for government's current operations. The rest, government savings, is used to build new public facilities and/or replace a part of the existing ones or augment and/or replace the physical capital of the government-owned businesses. As government seeks to purchase goods and services and engages in investment activities, it generates, respectively, government consumption demand and government investment demand.

Box 8

Glossary

Dynamics
That part of economics which is concerned with analysing the movement of economic systems through time. The "economic systems" concerned may be a market, a firm, the economy as a whole or even a whole set of interrelated economies.

Household investment demand
The amount of money that households are willing to spend on final goods and services over a specified time period that are used either as capital goods or as inputs in housing construction.

Investment
Expenditure incurred over a specified time period on capital goods with the view to replacing and/or augmenting the existing physical capital. In macro-economic terms, "gross" investment refers to the total expenditure on new capital goods, while "net" investment refers to the additional capital goods produced in excess of those that wear out and need to be replaced.

Statics
That part of economics which is concerned with analysing the economic system in equilibrium. The equilibrium is "timeless" or static in the sense that it does not change with time, it is fixed for all times, unless one of the underlying relationships in the system changes.

(b) Commodity markets

Household consumption demand is by far the most important of the components of final demand that are directly influenced by demographic variables. For each population group, consumption demand is influenced by its size as well as its age structure. Household consumption demand is also affected by non-demographic variables, notably the amount of disposable income. Population size helps to determine the group's per capita disposable income and, through it, the group's average propensity to consume (box 10) as well as the structure of the group's consumption demand by commodity category. Given differences in consumption requirements and preferences at different stages in one's life cycle, the group's age composition also affects the structure of consumption demand.

The level and pattern of household consumption demand varies considerably across population groups owing, among other things, to differences in preferences. Where inter-group differences are pronounced, aggregate household consumption demand can be significantly influenced by the distribution of the population among the various groups. That is, aggregate household consumption demand will be more heavily influenced by the preferences of those groups having larger weights in the total population.

Box 9

Glossary

Corporate investment demand
: The amount of money that corporations spend on capital goods over a specified time period in order to replace and/or augment their capital stock.

Government savings
: The portion of government disposable income not expended on current operations. It represents a measure of the amount available to government for investment.

Gross business savings
: The residual of net income accruing to corporations, after payments are made in various forms such as dividends and direct corporate taxes. It is usually kept by incorporated businesses as reserves and depreciation allowances or to finance new investment. It represents a measure of the amount available to corporations for investment.

Indirect taxes
: Taxes levied on goods and services purchased by consumers and exported by producers, for which the taxpayer's liability varies in proportion to the quantity of particular goods purchased or sold. Examples of indirect taxes are customs duties (tariffs), excise duties, sales taxes and export duties.

Physical capital
: The stock of goods used in production, which have themselves been produced. It consists of inventories and such durable goods as buildings, plants and machinery.

Government consumption and investment demand may also be significantly influenced by demographic variables, particularly in sectors seeking to provide services such as education, health care and housing. Since requirements for those services depend, among other things, on the group's demographic characteristics, the government demand is influenced by those demographic factors. Thus, a group having a large size and a larger proportion of their members within the school-age span would ceteris paribus have greater requirements for educational services and would increase government demand originating in the education sector.

Box 10

Glossary

Average propensity to consume
: For the economy, this is the proportion of national income devoted to consumption. Similarly, the average propensity to consume of an individual or a population group is the proportion of the individual's or group's income that is devoted to consumption.

Commodity markets
: Markets in which commodities are bought and sold through a process that determines prices and quantities of commodities traded.

Export demand
: The amount of money that foreign buyers spend over a specified time period on commodities of a particular economy.

Intermediate demand
: The amount of money that producers spend over a specified time period on goods and services that are used as inputs into production of other goods and services, rather than for final consumption.

Subsidy
: A special type of transfer payment to a corporation to prevent it from experiencing losses or to prevent an increase in its price.

However, since other factors influence the demand for services, different population groups having similar numbers of potential users of given services could have vastly different demands for those services. Where this is the case, the demographic effects on government consumption and investment demand could well transcend those arising from the demographic traits of the population groups. Under these conditions, the demands for the various services at the aggregate level would also be a function of the population distribution among the groups, and so would government consumption and investment demand.

Consumption, investment and government demand, together with export demand, comprise the total final demand. This, plus intermediate demand, make up the total demand for goods and services. To meet this demand, the various producers--corporations, unincorporated businesses and government--generate the economy's output, which together with imports yield the total supply of goods and services. Parts of the total demand and supply are exchanged in the nation's commodity markets. The remaining quantities of goods and services are used by their producers.

The transactions taking place in commodity markets determine the quantities and prices of commodities traded. As a rule, these market outcomes reflect, inter alia, the imperfections and rigidities characteristic of those markets. Those imperfections and rigidities are partly the consequence of government policy interventions operating through subsidies, indirect taxes and prices, and partly the result of institutional and structural rigidities.

One of the outcomes of the market clearing process is the acquisition of goods and services by population groups. These goods and services usually meet only a part of their consumption needs. Another part is satisfied by what the groups produce for their own consumption. And yet another part is met by the goods and services provided by the Government. The total consumption of goods and services determines the living standards of the various groups.

(c) Factor markets

In the course of generating the economy's output of goods and services, producers employ a range of production techniques. In some sectors, modern capital-intensive (box 11) methods are used along with traditional labour-intensive techniques to turn out similar products. In other sectors, competition among alternative production methods is largely absent as one class of techniques is universally preferred to the others. Through most of the economy, however, there is often substantial room for substitution between labour and capital.

To generate output, producers hire the services of productive factors--land, capital as well as labour of various skills. The quantities of various factors demanded will depend on the output levels being generated, the structure of output by sector, the technologies used in those sectors and prevailing prices of factor services.

Box 11

Glossary

Capital income
Income of different kinds, including profits, dividends and interest, accruing to physical capital and financial claims in return for services rendered by those forms of capital.

Capital-intensive
A process of production using proportionately more capital than other factors of production, such as labour.

Capital market
The market for long-term loanable funds as distinct from the money market, which deals in short-term funds. In principle, capital market loans are used by industry and commerce for fixed investment. The capital market is not one institution, but all those institutions that canalize the supply of long-term funds.

Factorial distribution
The distribution of income among various factors of production in return for services rendered by those factors.

Factor markets
Markets in which services of factors of production are bought and sold through a process that determines prices and quantities of those services traded. In aggregate terms, for instance, the labour market or the capital market.

Labour income
Income, primarily in the form of wages and salaries, accruing to labour in return for services rendered by it.

Labour-intensive
A process of production using proportionately more labour than other factors of production, such as capital.

Labour market
The market in which labour services are bought and sold through a process that determines the level of employment of labour as well as wages and salaries.

Rental income
Income accruing to a durable good, such as land or buildings, in return for services rendered by the good.

The owners of factors of production include all institutions--population groups, corporations and government. Labour services are exclusively supplied by population groups and in particular by those who participate in the labour force. The degree of their participation is a function of a number of factors: economic, social and demographic.

Depending on the distribution of land ownership, land services are provided by one or more population groups. Similarly, capital services are supplied by the institutions possessing assets in the form of physical and financial capital. These may include corporations or government, as well as all or only some population groups.

The transactions between buyers and sellers in factor markets determine the quantities of factor services hired as well as factor prices. Typically, only a part of the nation's demand for and supply of factor services appears in these markets as there are large segments of economy where the producers use factor services which they provide themselves. Like the commodity markets, factor markets are subject to imperfections and rigidities, which are partly the consequence of market fragmentation arising from less than perfect factor mobility and partly the result of the prevailing institutional arrangements. 3/

The operation of factor markets determines employment levels and prices of various factors, but also the levels of factor unemployment. Often, the most visible form of factor unemployment is unemployment of urban labour. The relative abundance of other categories of labour relative to natural and man-made resources manifests itself in underemployment, characterized by low productivity levels. 4/

(d) Income distribution

The employment of productive factors yields factor incomes and the factorial distribution of value added. Factor incomes accrue to the owners of factors of production--the institutions. Labour income is typically received by the households of various population groups. Capital income of different sorts--profits, dividends and interest income--accrues to institutions, including population groups, owning capital assets and financial claims. Similarly, rental income is received by property owners, and in particular by those owning land.

The process by which factor incomes are transformed into incomes of institutions is normally influenced by government. By means of the policy instruments at its disposal--particularly taxes and transfer payments--the government affects this process with the aim of raising the revenues needed to finance the provision of public goods and services and to modify incomes of other institutions. From the point of view of these other institutions, the taxes and transfers amount to net transfers. Once those net transfers are made, the distribution of income among the institutions is completed. The end result of this process is the disposable incomes of institutions (the point at which this description of the system started).

In summary, the standard of living of different population groups is a function of the quantities of goods and services these groups consume. These, in turn, largely depend on the disposable incomes these groups command, the prices they are charged, their wants as well as their demographic characteristics. In addition, they are a function of the goods and services that government makes available to the groups. The disposable incomes of population groups, in turn, depend, among other things, on a number of institutional and structural arrangements. Thus, they depend on the ownership of factors of production by the groups, the levels at which the factors are employed and the prices their services fetch, as well as on the government policy relating to taxes and transfers. Through employment levels and prices of factors of production, the disposable incomes of population groups are influenced by a number of the variables in this framework, among which is the commodity composition of private consumption demand, which in turn depends on the level and distribution of incomes.

2. Dynamics

The way in which the system changes over time is largely influenced by two major interrelated processes, which respectively set into motion two chains of events. One of the processes, asset formation (box 12), gives rise to a series of economic changes. The other consists of demographic events, which bring about population changes. These two processes and the resultant changes are discussed below.

(a) Asset formation

Central to the process of asset formation is capital formation--the process by which additions to the nation's stock of physical capital are made. This process is sustained by the savings and investment decisions taken, respectively, by institutions and producers. Each of the three types of institutions distinguished earlier can generate surplus funds over and above current consumption. These funds take the form of household savings, gross business savings, and government savings (the current government surplus), respectively, and together make the pool for investment. In a typical developing economy some of these savings and investment decisions are independent of one another while the others are made jointly and represent the two sides of the same process. This is the case when small unincorporated producers, mainly family businesses, rely on their own savings for investment.

Parallel to the increase in the stock of physical capital is a process of human capital formation. If human capital is defined to include a range of skills, this process can be visualized as one involving both additions to the labour force and the upgrading of its skills. The accumulation of human capital can, therefore, be visualized as a consequence of population change, educational processes--formal as well as informal--and the forces affecting the participation in the labour force.

Yet another form of asset formation consists of additions to as well as improvements in land and its products. This process is especially important

Box 12

Glossary

Asset formation
Additions to assets such as land, physical capital and human capital that households, corporations or government own.

Capital formation
Additions to the stock of physical capital. Two types of capital formation are distinguished--gross and net. The former includes replenishment of inventories, depreciation, repairs and maintenance expenditure, while the latter excludes them.

Human capital
Productive investments embodied in human persons. These include skills, abilities, ideals, health etc. that result from expenditures on education, on-the-job training and medical care.

Migratory movements
Geographic mobility defined as change of usual residence between defined political or statistical areas or between residence areas of different types.

Technical progress
Increased application of new scientific knowledge in form of inventions and innovations with regard to capital, both physical and human.

Vital events
Births, deaths, marriages and divorces.

in economies where agriculture and mining are the predominant sectors. In the case of agriculture, for example, additions to arable land may result from a number of different activities, ranging from the resettlement of population into new agricultural zones to the conversion of forested land into cultivable fields. Land improvements may result from irrigation, terracing, and so on.

Technical progress influences and is influenced by the pace of asset formation. A major factor in stimulating the long-term economic growth in both developed and developing countries, technical progress is affected by a number of factors, among which could be demographic trends.

(b) Economic change

Asset formation gives rise to new production activities and brings about structural change in the economy. These changes are typically multi-dimensional. Thus, they often involve shifts in the sectoral structure of output towards manufacturing and services and away from agriculture, typically favouring urban as opposed to rural areas. The structural changes manifest themselves in the growing importance of modern businesses as against traditional activities, especially in the urban economy, and in the adoption of capital-intensive in the place of labour-using technologies.

In addition to bringing about growth and structural change in the economy, asset formation also alters the distribution of the ownership of factors of production among different institutions, and more particularly among various population groups. These changes, typically, have multiple implications for the entire system. The most important among them, from the viewpoint of the standard of living, is the redistribution of factor incomes among households and other institutions altering the distribution of disposable incomes and ultimately the standards of living of population groups.

The Government may intervene in the process of asset formation with a view to bringing about changes in the distribution of asset ownership in favour of poverty groups. In doing so, it may resort to policy instruments and structural reforms that improve the access of those groups to credit, training, modern-sector employment and land. The objective of these interventions may be to increase household disposable incomes, household consumption and living standards for poverty groups and, by implication, to achieve greater economic equality among groups.

Revisions in disposable incomes of various groups, whether or not they occur partly as a result of government action would usually have further repercussions over time. They would first lead to changes in the output mix through altered household consumption demand, provided that constraints on the supply side did not prevent producers from responding to the new demand. The new output mix would imply changes in the demand for factor services and a new pattern of employment of productive factors. Ultimately, this may bring about changes in the factorial distribution of income and a new distribution of income among institutions, including population groups.

(c) Demographic processes

Demographic processes are shaped by vital events or migratory movements. Vital events include births, deaths, marriages and divorces. Migratory movements include various types of moves into and out of a population group. The migratory processes are broadly defined in this framework to include all types of movements affecting population groups, no matter whether they involve physical movements or not. A migratory movement could include a change in one's residence, a change in one's socio-economic status, or both.

(d) Population change

Demographic processes bring about changes in the size and composition of various population groups. Fertility and mortality levels vary among groups and result in different rates of natural increase. The rate of population growth is modified, sometimes drastically, by migration among groups and, where the country is open to international population movements, by international migration. Consequently, some groups may experience rapid increases in their numbers, far beyond those resulting from their births and deaths, while other groups may grow more slowly or even shrink in size in spite of their positive balance of births over deaths. The end result of demographic processes over time is the revised totals of individual population groups and, by the same token, the altered distribution of the total population among the groups.

In addition, demographic processes bring about changes in the composition of the various population groups by age, sex, and other characteristics. Of particular interest to the planner are shifts in the age structure of these groups. Where fertility and mortality conditions have remained roughly stable in the recent past, these shifts can arise primarily from inter-group population transfers and/or international migration. However, fertility and mortality decline have an impact on the age structure in their own right. The effects of a fertility decline are typically far greater than those arising from a mortality decline. Thus, a fertility decline causes the age structure to become progressively "older", while a comparably large mortality decline, distributed over all age groups has less effect on the age structure.

Migration is often highly selective by age (and often by sex). In general, a disproportionate share of migrants are persons in the working ages. Therefore, groups experiencing net gains due to migration mainly undergo increases in their numbers of working age persons. Similarly, groups experiencing net losses largely suffer a depletion of those same age groups. As a result, the former groups typically witness declines in their dependency burden (ratio of the young and old population combined, to the working age population) and the latter groups see their dependency burden rising.

Migration can be also highly selective with respect to education. This selectivity both derives from and reinforces inter-group differentials in educational attainment. The causes of these differentials are twofold. First, occupations in which members of various groups are predominantly engaged require types of skills that are normally acquired through schooling of varying duration (or no schooling at all). And second, educational attainment is often closely associated with personal income and wealth and is therefore bound to vary among the groups enjoying different income levels and standards of living. Where selectivity of migration by education is strong, migratory processes tend to perpetuate inter-group educational differentials, though they do not alter the educational distribution of the total population.

D. Economic-demographic interactions

Asset formation and demographic processes, and the economic and population changes emanating from them interact over time in a number of complex ways. Some of these interactions are well understood, others are not. These interactions have such an important impact on the dynamics of development and population change that planning exercises need to take them into account.

The description of relationships that follows is intended to be illustrative rather than prescriptive because the way any given relationship manifests itself in any particular country will depend on a wide range of unique local conditions. To effectively consider any such relationship in developing the planning framework for a particular country, a careful review of the local conditions is absolutely essential. Only in that way can the framework be fully adapted to the unique local conditions.

1. Effects of population change on socio-economic variables

Demographic variables operate on economic variables largely through two different channels. In one, population change influences the supply of goods and services, mainly indirectly through asset formation. In the other, population change impacts on the demand for goods and services directly. Each of the two groups of effects will be reviewed. The effect of population change on the distribution of disposable incomes will also be considered.

(a) Supply of goods and services

Population change may impact on the supply of goods and services *inter alia* through household savings. In each population group, these savings could be influenced over time by the increase in the group's size and the change in its age structure. In particular, the effect of population increase is transmitted through per capita income. All other things being equal, a reduction of the group's population growth from high to moderate levels would lead to a faster increase in its per capita income. This, in turn, could lead to a more rapid increase in both *average saving ratio* (box 13) and the total volume of household savings. This would be true whenever the *income elasticity of savings* is greater than unity, as is often the case in many developing countries. The effect of the change in the age structure on household savings may be positive if this change amounts to a decrease in the dependency burden. 5/

Population growth can also influence the way savings, especially government savings, are invested. A distinction is sometimes made between directly productive investments, such as those made into irrigation schemes or factories, and investment in social infrastructure, such as housing, education or water supply systems. It is argued that the former type contributes directly to output growth, while the contribution of the latter type is indirect and delayed in time. The latter directly improves the welfare of population groups, and its contribution to output growth is to eventually produce a better educated, healthier and presumably more motivated labour force.

A reduction of rate of population growth from high to moderate levels may favour investment allocation to directly productive investment and, therefore, earlier output growth. With a given volume of savings--including household, corporate and government savings--a slower population growth necessitates channelling a smaller share of those savings to social infrastructure investment in order to maintain a given per capita level of services. As a result, a larger proportion of savings is available for directly productive investment, enabling faster capital accumulation and output growth.

Population growth, over a period of time, leads to an increase in the working-age population (a prime determinant of the labour force) and, thus, has a positive effect on output. This effect, however, may be quite weak if unskilled labour is in excess supply. On the other hand, in those developing countries that have no labour surplus, population growth and the resultant labour force increase can act as the major stimuli to output expansion. Irrespective of the overall human resources situation, an increase in the educated labour force can be beneficial to economic expansion. Where educated labour is abundant, available managerial and technical skills may provide a strong stimulus to output growth.

Box 13

Glossary

Average savings ratio
: For the economy, this is the proportion of national income devoted to savings. Similarly, the average savings ratio of an individual or a population group is the proportion of the individual's or group's disposable income which is saved. The savings ratio is sometimes used synonymously with the average propensity to save.

Income elasticity of consumption
: The responsiveness of expenditure on a commodity or a group of commodities to changes in the consumer's income, measured by the proportionate change in expenditure divided by the proportionate change in income.

Income elasticity of demand
: The responsiveness of the quantity demanded of a commodity or a group of commodities to changes in the consumer's income, measured by the proportionate change in quantity demanded by the proportionate change in income.

Income elasticity of savings
: The responsiveness of the amount of money saved to changes in the consumer's income, measured by the proportionate change in savings divided by the proportionate change in income.

Other effects of population change on output growth are more subtle. Among them is the impact of population increase on agricultural output growth in densely populated countries with limited arable land. In such a setting, additions to the total population may cause a net loss of cultivable land for a number of reasons, including the growth of urban centres and the expansion of land-using infrastructure. More important, population growth can cause soil degradation due to overexploitation of land which in turn could result in a slower agricultural growth and even in a decline in the per-capita agricultural output. On the other hand, rising population pressure on land can trigger improvements in agricultural techniques, bringing about increases in land productivity and per capita agricultural output. 6/ It can promote the adoption of more productive labour-intensive agricultural techniques. Also, it can promote irrigation and cropping thereby increasing effective land areas and per capita agricultural output.

(b) Demand for goods and services

The effects of population change on the demand for goods and services, are particularly direct and strong in the case of household consumption, the largest component of final demand. The effects on government consumption and investment demand, are probably as significant but less direct. Lastly, the influences of population growth on household and corporate investment demand are more roundabout and delayed in time as they are transmitted through other demand components.

Like household savings, the household consumption demand of a population group is affected by a change in the population size as well as in its age structure. The increase in the size of any given population group affects its household consumption demand through per capita disposable income. Thus, a reduction of the rate of growth of a particular group from a high level would ceteris paribus lead to a more rapid increase in the group's per capita income. This, in turn, could cause a drop in the group's average propensity to consume. This would be true under the plausible assumption that the income elasticity of consumption is smaller than one.

Population growth can also affect the structure of household consumption demand by commodity categories, operating again through per capita income. Thus, all other things being equal, a substantial deceleration of the population increase would cause per capita income to grow faster, and this, in turn, would lead to a relative increase in the consumption of commodities having an income elasticity of demand greater than one. Such commodities are more likely to be considered luxury items.

The structure of household consumption demand of a population group could also change as a result of shifts in the group's age structure. Since consumption preferences vary among persons at different stages of the life cycle, the demand for various consumption goods and services would change as the proportions of a group's members at different years of age change.

The re-distribution of the total population among the groups may exert further influence on household consumption demand at the aggregate level. The levels and patterns of consumption demand may differ among the groups for a

variety of social and cultural reasons. Hence, aggregate household consumption demand may undergo changes in response to the shifts in the relative shares of the various groups. These changes take place as the preferences of the population groups gaining in size become increasingly felt relative to those of the groups shrinking in relative size. Thus, in a country experiencing rapid urbanization and modernization, the composition of aggregate household consumption demand would tend to become progressively "urban" and "modern" as population groups having these attributes tend to expand at the expense of other groups.

The influence of population change on government consumption and investment demand is typically strongest in those sectors providing social services. All other things being equal, an increase in the size of the relevant segments of the population or the total population of a group translates into an increased demand for specific services. Thus, for example, an increase in the school-age population ceteris paribus would lead to the growing demand for educational services.

In addition to this, a change in the age-sex structure of segments of the total population would tend to modify the demand for specialized services in fields such as education and health. Thus, given the increase in total school-age population, shifts in its age-sex structure can cause the demand for educational services at different levels of schooling to grow at different rates, and some to decline. This would happen, for example, in a group that had been recently experiencing a sharp reduction in fertility leading to the decreasing numbers of children eligible to enter elementary schools. Similarly, changes in the group's age structure can modify the demand for the specialized health services, such as those catering to children, women of childbearing age, and the elderly.

(c) Distribution of income

Demographic change may also have an impact on the disposable incomes of population groups. Thus, in the short to medium run, differences in population growth brought about, say, by differences in fertility declines experienced by different groups can increase or decrease inter-group differentials in per capita disposable income and the standard of living. For example, where population groups with higher standards of living experience more rapid fertility declines and slower population growth than groups with lower living standards, the inter-group differences in the standard of living might increase.

In the long run, a different kind of effect of population growth on inter-group income inequality and the standard of living may operate. Where overall population growth is rapid, a concomitant rapid increase in the supply of labour may reduce the rate of return to labour relative to the rate of return to other factors of production. Since the wealthier population groups generally possess a disproportionate share of non-labour factors of production, their disposable incomes are likely to increase relative to other population groups. As a result, rapid population growth may lead to a more unequal income distribution (Working Group on Population Growth and Economic Development, 1986).

2. Effects of socio-economic change on demographic variables

The effects of socio-economic change on demographic variables are complex and not fully understood. Some effects are largely direct whereas others operate indirectly through intermediate variables that can be social, cultural and biological.

These relationships are generally the result of the behaviour of numerous individuals, couples or families. The behaviour underlying these relationships is frequently moulded by cultural and institutional factors, which often do not lend themselves to rigorous quantitative analysis.

In spite of their elusive nature, these relationships are a part of the framework since they are of increasing interest to policy analysis and planning. These relationships are reveiwed below and suggestions are made on how social and economic change affects demographic processes through them.

(a) Fertility

Among the most important relationships between socio-economic and demographic variables are those by which the two principal determinants of fertility in a population are shaped (United Nations, 1987). One of the determinants is the extent to which women of various childbearing ages are married, which is generally an outcome of marriage formation and dissolution, and the other is the extent to which the married women give births.

(i) Marriage

The proportion of women who are currently married is primarily determined by the age of entry into first marriage and the extent to which women choose to remain single. Thus, where the mean age of first marriage is low and celibacy among women is rare, the proportions of women currently married rises swiftly with age and typically remains close to unity towards the upper end of the childbearing span. Whether or not women enter first marriage early and whether or not a small proportion of them remains single is largely a function of societal norms and customs. It is further a function of the alternatives to marriage, among the most important of which are secondary and higher education and employment outside the home. In addition, it is also a function of the availability of eligible males.

(ii) Marital fertility

Decisions by couples on the timing, spacing and the number of children are influenced by a variety of factors including group-level and/or societal norms, household incomes, benefits and costs of children, mortality conditions, and the preferences for children versus other sources of satisfaction. These decisions can be often influenced by government policy towards fertility.

Some of the effects of economic change on the reproductive decision of couples are direct while the others are roundabout. Some are immediate while others are delayed.

Socio-economic change also affects the costs and benefits of children to parents. In general and over the long term, such changes tend to increase the former and reduce the latter. The combined effect of rising costs and falling benefits is a decline in the number of children desired. These trends in costs and benefits most often are initially more intense in urban-based groups. As a result, fertility reduction usually originates in urban groups and later spreads to rural groups.

Direct costs of children, which are heavily influenced by the prevalence and duration of schooling, tend to increase with development as education becomes more universal and prolonged. Opportunity costs (box 14) also tend to grow as employment opportunities for women improve and their skills and educational attainment are upgraded. At the same time, both economic and old-age-security benefits of children tend to decline. The former fall as a result of the process that transfers a growing proportion of children from the labour force to the educational system. The latter decline as institutionalized social security programmes gradually supersede the family as the major provider of old-age security.

Box 14

Glossary

Inter-birth interval
Time elapsed between successive births.

Morbidity
The extent of illness, injury or disability in a population.

Opportunity cost
The value of the alternatives or other opportunities that have to be forgone in order to achieve a particular thing. It coincides with money expenditure or outlays necessary to achieve it, if and only if the prices with which the outlays are calculated correctly reflect the value of alternative uses of the resources.

Post-partum sterility
The period of temporary sterility following a birth. The duration of this period is heavily influenced by duration and intensity of breast-feeding.

A fertility decline brought about by social and economic change is sometimes reinforced by mortality reduction, especially by mortality decline occurring in infancy and early childhood. Where fertility is uncontrolled, declining mortality would cause a fertility decline at least among some couples through a biological mechanism. Fewer deaths would mean longer post-partum sterility associated with lactation and, thereby, longer inter-birth intervals and lower fertility. Where fertility is subject to control, mortality reduction would lead to lower fertility because as fewer children die, a smaller number of births are required to achieve a desired number of surviving children.

The preferences of parents for children versus other sources of satisfaction undergo changes with development. Typically these shifts lead to a decline in the number of children that parents desire. In many situations, however, desired fertility is lower, sometimes considerably lower, than the fertility actually achieved by the couples. This is normally the consequence of the inability of couples to effectively control their fertility. It may derive from the fact that the knowledge of suitable and effective contraceptives is limited, that such contraceptives are not readily and widely available, or that available methods are unacceptable for cultural, religious or other reasons.

(b) Mortality

There are different routes by which socio-economic change influences mortality. One major channel through which these effects are felt is household income and consumption. Where these increase over time, morbidity and mortality are likely to decline. With rising incomes and consumption, the nutritional intake and balance is likely to improve, bringing about greater resistance to disease. Furthermore, growing incomes and consumption typically lead to improvements in household sanitation and reduced exposure to disease. Finally, rising household incomes may enable households to spend more on health care.

Economic change also operates on mortality through the resources used by communities or the Government to make environmental improvements. In particular, where economic expansion is rapid these resources may become more plentiful. If they are used to upgrade existing and build new facilities, such as water supply and waste disposal systems, the improvements in environmental sanitation will translate into lower morbidity and mortality.

The third channel by which economic change influences mortality is the health system, and particularly its public component. In general, rapid economic growth increases the share of the national product allocated to the public health sector, with the result that both preventive and curative health care becomes more readily available to the population.

(c) Migration

Migration is often particularly important for the planner because, unlike fertility and mortality, migration can respond quickly to social and economic change. This is true both of internal migration and of international migration. Hence, the planner may consider migration to be a component of population change over which he can exert substantial influence in the medium term and, sometimes, even in the short term.

Internal migration usually occurs as individuals and families respond to differences in economic and other opportunities in various locations. However, these decisions are normally taken under conditions of imperfect information and often under financial and other constraints. Those other constraints may include linguistic, ethnic, caste or institutional barriers to mobility.

Domestic economic expansion usually favours some population groups over others and, consequently, the economic opportunities open to various groups differ. This brings about mobility from groups having poorer to those enjoying better opportunities and access to assets, employment, services etc. This mobility may take on a number of different forms, such as migration of landless farmers to new arable land in another rural area. Another form would be a movement of underemployed farm labourers from depressed rural areas to the informal urban-based economy. Yet another form would be that involving a transfer of adolescents, after completing education, from families affiliated with the urban informal sectors to the groups attached to the modern urban economy.

As development favours some groups more than the others, per capita incomes in various groups are likely to grow at different rates, meaning that the members of different groups would not find mobility equally affordable. This is particularly true of moves that require the acquisition of assets, no matter whether these take the form of land purchases or the acquisition of new skills through formal schooling.

Responses to differential economic and social opportunities may also take the form of international migration. When this type of migration involves the movement of members of the domestic population groups towards foreign countries, emigration can be permanent, temporary or a combination of the two. Temporary emigration, which normally includes workers seeking or accepting employment abroad on a temporary basis, is accompanied by a movement of population in the opposite direction. This reverse movement represents the return migration of the original temporary emigrants.

E. Summary

To better understand how various policies or structural reforms can influence the standard of living of various population groups, it is necessary for a planner to have a conceptual famework or a mental model as a basis for comprehensive planning. This chapter outlines such a framework including demographic variables, which permit one to visualize how different socio-economic or demographic policy instruments and reforms, operating through

economic growth, population change or income re-distribution have an impact on standards of living. This framework is being described as a backdrop for projection exercises that can be prepared with the proposed methodology for comprehensive planning.

The framework, which makes a distinction between three categories of institutions--population groups, corporations and government, is considered from both the static and the dynamic point of view. The statics of the system is described by looking into the chain of linkages running from incomes of institutions to demands in commodity and factor markets, to incomes of factors of production, and back to institutions' incomes. The dynamics of the systems is examined by considering the asset formation process and economic changes emanating from it along with demographic processes and the resultant population change.

An important aspect of the framework are two-way interactions between socio-economic and demographic variables of the system. Therefore, the effects of population change on key socio-economic variables, the supply of and demand for goods and services and the distribution of incomes are described. The effects of socio-economic changes on demographic variables and especially those on the key components of population change--fertility, mortality and migration--are also discussed.

Notes

1/ The framework will draw ideas from the critical re-examination of growth-oriented planning, which initially sought to balance rapid economic growth with income redistribution. It will also borrow from the conceptual frameworks underlying recent Indian planning and Bachue-type economic-demographic modelling. The discussion will also make use of a recent review of the consequences of demographic trends for socio-economic change. For the relevant literature, see: Chenery and others, 1974; Pyatt and Thorbecke, 1976; Government of India, Planning Commission, 1981; Rodgers and others, 1978; and Working Group on Population Growth and Economic Development, 1986.

2/ Note that this three-way classification of institutions is similar to a three-way classification of economic agents in the standard economic analysis, which distinguishes among households, businesses and government.

3/ Thus, in the capital market, which often consists of two insulated segments serving respectively modern and informal sectors, they appear to be the result of the lack of an adequate network of financial intermediaries serving both segments simultaneously. In the labour market, which normally consists of two or more semi-independent markets, minimum wage legislation, trade unions and the employers' willingness to share the productivity gains with their workers may all contribute to less than perfectly competitive conditions, especially in the urban areas.

4/ Underemployment is particularly widespread and typical of much of economic activities in a developing country. It is normally seen as one of the most conspicuous signs of underdevelopment and as the root cause of poverty. As a result, development usually amounts to providing more productive employment to a large and often rapidly growing underemployed labour force with the concomitant increase in incomes and the standards of living of large segments of the population.

5/ The available evidence on this effect, however, is at best ambiguous. Its importance is likely to be far smaller than that of the population increase.

6/ For a recent summary of the literature on the effects of population growth and density on agricultural technology, see Working Group on Population Growth and Economic Development, 1986.

References

Chenery, Hollis and others (1974). Redistribution with Growth. Oxford: Oxford University Press.

Government of India, Planning Commission (1981). The Sixth Plan of India (1980-1985). New Delhi.

Pyatt, Graham and Erik Thorbecke (1976). Planning Techniques for a Better Future. Geneva: International Labour Office.

Rodgers, Gerald B. and others (1978). Population, Employment and Inequality: BACHUE-Philippines. Saxon House, Westmead, Farnborough, Hants, England: published for the International Labour Office.

Working Group on Population Growth and Economic Development (1986). Population Growth and Economic Development: Policy Questions. Washington, D.C.: National Academy Press.

United Nations (1987). Fertility Behaviour in the Context of Development: Evidence from the World Fertility Survey. Sales No. E. 86.XIII.5.