INTRODUCTION

A. Origins, objectives and scope of the manual

1. Origins

After the Second World War, an increasing number of low-income countries turned to development planning as the means of promoting their economic and social development. As a result, the early 1950s saw the formulation of the first national development plans in those countries (Morawetz, 1977). The major objective of development at the time was to increase the standard of living of the population by attaining such secondary objectives as output growth, full employment (box 1)*, greater economic equality and the satisfaction of basic needs (Waterston, 1979; Morawetz, 1977). To meet those objectives, it was asserted that development planning must take population change into account as fully as possible. Thus, a United Nations document stated at the time that:

"The primary needs of the people, which the development programmes aim to satisfy, cannot be gauged rationally without regard to the expected size and composition of the population, nor can the national resources be appraised adequately without considering labour, the supply of which depends primarily on population size and structure. If no estimates based on systematic analysis of population trends are available, the planners can only proceed with more or less vague assumptions or notions concerning the magnitude of needs and resources (United Nations, 1956).

In spite of the importance given to a variety of development objectives at the early stages of post-war planning, in many countries output growth became the dominant objective in much of the two decades after the mid-1950s. The basic assumption was that economic growth would help alleviate unemployment, income inequality and poverty, provided that it were fast enough (Morawetz, 1977). Partly as a result of this view, the interest of planners in population and related variables proved considerably weaker than had been anticipated in the early post-war years. In comprehensive national planning, this interest often did not transcend the size of population and its growth. These two variables were primarily used in this type of planning to calculate economic growth in per capita terms and to set overall output targets.

* Terms defined in glossary boxes are underlined where they appear for the first time.
Box 1

Glossary

Full employment
A state of the economy where only frictional unemployment exists, and everyone else who wishes to work at the going wage rate for the given type of labour is employed. Frictional unemployment reflects the time needed to switch from one job to another.

Household consumption
The value of "final" goods and services consumed by households over a specified time period to meet their various consumption needs.

Household income
The flow of money or goods accruing to a household over a specified time period.

Poverty
A situation where a population or a section of a population is able to meet only its bare subsistence essentials of food, clothing and shelter in order to maintain minimum levels of living.

Unemployment
A situation which exists when members of the labour force wish to work but cannot find employment at the prevailing wage rate.

In sectoral planning, however, and especially in planning concerned with the provision of social services, population variables figured far more prominently. There, it proved important to consider not only population size and growth, but also its structure and distribution. In spite of this, population did not begin to emerge as one of the central variables of development planning in many countries prior to the mid-1970s.

Around this time it became increasingly clear that some of the development strategies adopted in the preceding two decades had been incapable of redressing the major economic and social problems of developing countries. Consequently, an interest in development objectives other than economic growth re-emerged in a number of countries. Employment generation, income equality and the satisfaction of basic needs began to figure as high on some planners' agendas as output growth itself. In order to achieve those objectives, it has been proposed that the scope of planning be extended by dealing directly with employment, household income and household consumption. It has been further suggested that extending the scope of planning in this way would bring a variety of demographic variables into the planning process (Chenery and others, 1974).
The mid-1970s also witnessed a growing consensus among national Governments about the importance of population considerations in development planning. In particular, the World Population Plan of Action, adopted at the 1974 World Population Conference at Bucharest, reaffirmed the interdependence of demographic and development processes and called, inter alia, for development planning that would be more responsive to the needs of all the population (United Nations, 1975). Specifically, the Plan called for development planning that would meet national needs for specific goods and services, such as food and education, as well as satisfy the employment requirements of the labour force.

Following the Bucharest Conference, arguments in favour of incorporating demographic factors into development planning were advanced with increasing frequency. Those arguments, made in the context of a broader debate on integration of population and development planning, led the United Nations Economic and Social Council in the late 1970s to request the United Nations Secretariat to prepare guidelines for national planners on integration of population-related factors in the formulation and evaluation of development plans (United Nations, 1976). Upon reviewing the guidelines, the Council requested the Secretariat to prepare a technical manual on the methods of incorporating demographic factors into the development planning process. The present manual has been expressly prepared in response to that request with an objective of making this methodology more accessible to planners.

2. Objectives

Development planning may take a number of different forms. With respect to scope, it can be comprehensive or sectoral; in relation to geographic coverage, national or regional; and with respect to time horizon, short-, medium- or long-term. Organizationally, planning can be centralized or decentralized; and from the viewpoint of implementation, mandatory or indicative (Blitzer and others, 1975). Given this diversity, addressing a methodological manual to all types of planning would not be feasible. The present manual has been, therefore, designed to be applicable to a few specific types of planning, and in particular, to the national comprehensive and sectoral planning over the medium and long term. Furthermore, it has been designed to be used primarily by planners in countries with mixed or market economies practicing decentralized, indicative planning (box 2). In spite of this orientation, however, a substantial portion of the materials of this manual should be of considerable use to planners in socialist economies practicing central planning.

The two-way interactions between population and development manifest themselves fully only over the longer term. As a result, the methodology of the manual is bound to be more relevant to long-term than to medium-term and short-term planning. However, in a large number of developing countries, the former type of planning is less relevant to the policy-making process than the latter. In principle, this need not be so since medium-term planning could
Box 2

Glossary

Central planning
A type of development planning where government determines what shall be produced by various sectors of the economy, at what prices, and how factors of production shall be allocated among different users. The provisions of the plan, which is prepared at the centre, are mandated to the various sectors.

Comprehensive planning
A form of development planning, sometimes referred to as aggregative, global or overall planning which covers most or all sectors of the economy. This planning, unlike sectoral planning, is concerned with a full range of variables, including aggregate output, household and government consumption, savings and investment, imports and exports, employment and incomes.

Indicative planning
A type of development planning where government, in co-operation with the private sector, sets broad targets for the economy and defines policies to achieve those targets, including the allocation of public sector resources among the various users. The provisions of the plan are binding for the public sector but indicative for the private sector.

Labour force
Economically active persons, including armed forces and the unemployed, but excluding those not seeking employment, and conventionally, housewives and students.

Long-term planning
Preparation of a development plan for a time period that often ranges from 10 to 20 years.

Medium-term planning
Preparation of a development plan for a time period that typically ranges from 3 to 7 years.

Sectoral planning
A form of development planning, sometimes referred to as partial planning, which is concerned with individual sectors of the economy. Such planning is often conducted within the framework of a comprehensive plan.
frequently prove myopic unless a longer range view were also taken by the
planner. This is particularly true where considerable population change is
under way or will take place in the near future. In the countries where this
point is appreciated by planners and where medium-term planning is cast within
the framework of long-term planning, this manual may prove particularly
useful. In such countries, the opportunities to incorporate demographic
variables into development planning by means of the methodology described in
the manual would be potentially greatest.

The manual is directed at planners working at the central planning
offices and other governmental agencies involved in both comprehensive
planning and sectoral planning. Other agencies could include the central
statistical office and the planning departments of relevant sectoral
ministries. In particular, the materials on the methodology of integrating
demographic variables in comprehensive planning, which are included in the
first volume, have been developed for use primarily by planning officials in
central planning organizations. The materials on the methods relevant to
integration of demographic factors in sectoral planning, to be presented in
the second volume, will be useful to sectoral planners working at either
central planning offices or sectoral ministries.

The manual has been designed as a "how to" publication presenting
techniques for preparing various sorts of plan projections and addressing the
issues of their application in planning. Hence, it consists of a number of
methodological chapters describing various projection techniques. In
addition, however, it includes materials providing the rationale and the
conceptual basis for integrating demographic variables in planning. In the
methodological chapters, the objective is to give initially overviews of the
techniques along with their strengths and weaknesses, while spelling out the
principles of the techniques. An additional objective is to discuss the types
of inputs these techniques use and the way they could be prepared, and to
illustrate the application of the techniques in making projections.

The methodological chapters are primarily aimed at planners entrusted
with the development of the quantitative basis of national and sectoral
plans. The materials on the rationale and conceptual underpinnings of
integration are mainly addressed to planners charged with the co-ordination of
the planning process and over-seeing of the technical work on the plans.
These materials seek to sensitize planners to the potential benefits to be
derived from taking population change into account. They also seek to
describe major economic-demographic relationships that may need to be taken
into account in planning as well as describe how some of those relationships
can be dealt with in planning.

From the point of view of incorporating demographic factors in planning,
it is useful, though somewhat arbitrary, to make a distinction between
planning that is population-accommodating and planning that is
population-influencing. The former takes demographic variables into account
in order to accommodate prospective demographic change. The latter seeks to
influence demographic processes to attain specific development objectives.
The methodology of the manual is primarily suited to the former rather than
the latter type of planning. Specifically, the techniques discussed herein can be used, for example, in employment planning in order to meet the job requirements of the future labour force, consumption planning (and indirectly production planning) designed to satisfy the commodity requirements of the future population, and so on. The methodology of the manual is not designed to assist planners in formulating economic and social policies and programmes aimed at bringing about desired population change.

3. **Scope**

Preparing the quantitative basis of a national development plan or a sectoral plan normally involves making projections of selected economic, social and demographic variables over the plan horizon (box 3). In many developing countries those projections are made by means of partial techniques. In other countries, the number of which is still rather small, projections are being prepared by means of more or less comprehensive planning models. Because of the prevailing reliance on partial techniques and the likely continued use of those techniques in the future, the manual primarily deals with these techniques. In spite of this orientation, the materials of this manual could be also of considerable interest to planners working mainly with planning models. The reason for this is that a number of techniques described in the manual could be introduced into existing economic planning models as additional modules, thereby bringing demographic variables into those models and the planning process itself.

The methodological chapters of volume I deal with two groups of methods, for projecting demographic and socio-economic variables. The first group of techniques can be used to make projections of two key demographic variables—population and households. The second group of techniques can be used to make projections of school enrolment, labour force, employment, and incomes of households and other institutions (corporations and government). In addition, they can be used to make projections of household consumption and household savings as well as projections of selected components of government consumption and government investment.

The use of the former group of techniques is envisaged as a first step towards employing the methods of the latter group. This stepwise application of the methodology is conditioned by the fact that the projections of socio-economic variables depend directly or indirectly on the projections of demographic variables. It is through this sequential application of the methodology of volume I that at least a partial integration of demographic factors into comprehensive development planning can be achieved.

Some of the variables included in volume I can be projected by only one technique. This is the case of population, households, school enrolment, labour force, incomes, and selected components of government consumption and investment. The remaining variables can be projected using two or more alternative techniques. This is true of employment as well as of household consumption and savings. There are several reasons for having alternative techniques for projecting certain variables. First, alternative techniques enable projections under different data situations. Second, some techniques
Box 3

Glossary

Economic planning model
A mathematical representation of key economic variables and their relationships, normally used to prepare projections of output, use of productive factors, components of final demand etc.; it may be either sectoral or aggregate.

Government consumption
The amount of money that government spends on goods and services over a specified time period, other than that needed to replace and/or expand facilities.

Government investment
The amount of money that government spends on goods and services over a specified time period in order to replace and/or expand facilities.

Household
A single person living alone or a group voluntarily living together, having common housekeeping arrangements for supplying basic living needs, such as principal meals. The group may consist of related or unrelated persons.

Household savings
The portion of household disposable income that is not spent on consumption over a specified time period.

Plan horizon
A period of time to which a development plan refers.

School enrolment
The number of students who are enrolled and attend various educational institutions.

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can be used in situations in which other techniques are inapplicable as a result of the assumptions employed. Finally, some techniques can produce types of projection results that could not be produced with other methods.

In most cases, the preparation of the manual did not involve the development of new methods. The materials largely reflect the state of the art relevant to integrating demographic variables in comprehensive and sectoral population-accommodating planning. Some of the projection techniques presented are rather advanced and data intensive and are at present applicable
in a relatively small number of developing countries. There are also simpler techniques, applicable in most countries. The less readily applicable methods are included on the assumption that they will become useful in an increasing number of countries as planners' expertise and data bases improve.

It has recently been argued that population-accommodating development planning, especially if focusing inter alia on the well-being of the poverty groups, should treat population as one of the central variables and allow for its disaggregation into socio-economic groups (See, for example, Pyatt and Thorbecke, 1976). The manual recognizes the importance of this disaggregation, but nevertheless does not include methods for projecting population and related variables for those groups, because at the present time an adequate methodology and requisite data for such projections are not yet available. Nevertheless, the manual presents a number of methods for making projections by urban and rural areas. To the extent that urban and rural populations could be viewed as the two principal socio-economic groups, the manual is applicable to disaggregated planning, albeit partially.

The rest of this introduction will first discuss the contents of this volume by giving, among other things, a preview of the methodology contained in it. Then, a possible use of the methodology in planning will be considered.

B. Contents of volume I

1. Structure of the volume

Volume I of the manual will consist of three modules. This, the first module, consists of three chapters. Chapter I presents a conceptual framework for planning which provides a theoretical basis for the type of projection exercises relevant to comprehensive planning. The remaining chapters of the module, which are methodological in nature present methods for making demographic projections. In particular, the cohort-component method for preparing population projections is presented in chapter II, and the headship-rate method of household projections is presented in chapter III.

The further chapters, to be included in the second and the third module, describe the methods for making socio-economic projections. Chapter IV presents the enrolment ratio method of school enrolment projections. Chapter V describes a method for projecting labour force utilizing labour force participation rates. Chapters VI through VIII present methods of employment projections based on two types of employment-value added relationships and on production functions (box 4). Chapter IX describes the income projections method based on the social accounting matrix. Chapters X and XI present methods of household consumption and savings projections based, respectively, on different per-household and per-capita specifications of demand systems. Lastly, chapter XII describes a method of projecting government consumption and investment.
### Box 4

**Glossary**

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Average labour productivity</strong></td>
<td>The level of output per unit of labour input, usually measured as output per person-hour or person-year.</td>
</tr>
<tr>
<td><strong>Enrolment ratio</strong></td>
<td>The number of students attending a given school level, divided by the total number of persons of the age normally in school at that level.</td>
</tr>
<tr>
<td><strong>Headship rate</strong></td>
<td>The number of heads of households in a given age, sex and/or marital status category, divided by the corresponding number of persons in the same category.</td>
</tr>
<tr>
<td><strong>Labour force participation rate</strong></td>
<td>The number of persons in the labour force at a given age, sex and/or level of education, divided by the corresponding total number of persons of the same characteristics.</td>
</tr>
<tr>
<td><strong>Production function</strong></td>
<td>A mathematical representation of the technological relationship between the quantity of output of a firm, sector or the entire economy and the quantities of inputs required to make it.</td>
</tr>
<tr>
<td><strong>Sex ratio</strong></td>
<td>The number of males in a population or specific sub-population, divided by the corresponding number of females.</td>
</tr>
<tr>
<td><strong>Social accounting matrix</strong></td>
<td>The tabular presentation of the income and product flows in an economy during a specified time period. It consists of a set of accounts, such as those for factors of production (labour, capital) or institutions (households, corporations and government) along with the economy's input-output table.</td>
</tr>
<tr>
<td><strong>Value added</strong></td>
<td>For a firm or farm, the difference between its total revenue and the cost of raw materials, services and components used in production, over a specified time period. For the economy as a whole or any of its production sectors, the aggregate of value added of different firms or farms of which the economy or sector is composed.</td>
</tr>
</tbody>
</table>
2. Preview of the methodology

The methodological chapters of this volume present techniques which can be used to project two demographic and several socio-economic variables. Box 5 lists the variables along with the methods that can be used to project them.

(a) Methods for making demographic projections

Two techniques of demographic projections are indicated by the box: the cohort component technique of population projections and the headship rate method of household projections. The former technique projects population by tracing its age and sex structure over time. The results it generates include the age-sex structure of the population and a variety of summary indicators of population size, structure and change. Examples of these indicators are population size and population numbers in special, broad age groups; the sex ratio of the population; and rates of population change due to births and deaths.

The headship rate method projects households by applying headship rates to the population structures derived through a population projection. The headship rates, which are given by assumptions, reflect expectations regarding future changes in the formation and dissolution of households. The results of a household projection include the number of households, the rate at which this number changes over time and the average household size.

(b) Methods for making socio-economic projections

The first among the methods of socio-economic projections presented in the manual is the enrolment ratio technique of school enrolment projections. This method, which is a standard tool of educational planners, projects enrolment by applying enrolment ratios given by assumption to the school-age population suitably classified by age. The technique yields various results by academic level, which include the numbers of students, overall and by type of school (for example, public or private), as well as indicators of the size, composition and change in the numbers of students.

The labour force projection method applies labour force participation rates specified by assumptions to population structures. The results generated by the method include the size of the labour force and indicators of the growth and structure of labour force.

Among the techniques to project employment by production industry (or subindustry), two are based on different employment-value added relationships. The first of these methods employs average labour productivity that changes at a constant rate over time while the second uses employment-value added functions. These methods use projections of real value added as the key input to make projections of employment.
Box 5

Projection techniques for integrating population variables in comprehensive planning

**Methods for making demographic projections**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Technique</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>1. Cohort component method</td>
</tr>
<tr>
<td>Households</td>
<td>1. Headship rate method</td>
</tr>
</tbody>
</table>

**Methods for making socio-economic projections**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Technique</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students</td>
<td>1. Enrolment ratio method</td>
</tr>
<tr>
<td>Labour force</td>
<td>1. Labour force participation rate method</td>
</tr>
<tr>
<td>Employment</td>
<td>1. Average labour productivity method</td>
</tr>
<tr>
<td></td>
<td>2. Employment-value added function method</td>
</tr>
<tr>
<td></td>
<td>3. Method based on Cobb-Douglas production functions</td>
</tr>
<tr>
<td>Household, corporate and government incomes</td>
<td>1. Method based on the social accounting matrix</td>
</tr>
<tr>
<td>Household consumption and savings</td>
<td>1. Method based on per-household specifications of demand systems</td>
</tr>
<tr>
<td></td>
<td>2. Method based on per-capita specifications of demand systems</td>
</tr>
<tr>
<td>Government consumption and investment (in education, health and housing)</td>
<td>1. Method based on the Long-range Planning Model 2</td>
</tr>
</tbody>
</table>
A third method for preparing employment projections by industry is based on the Cobb-Douglas production functions. The method makes a projection by means of rearranged and estimated production functions. It makes use of projections of real value added and the capital stock (box 6) by industry as principal inputs. These different methods of employment projections yield projected levels of employment by industry (or subindustry) as well as selected indicators of employment structure and growth.

The volume also describes a method for preparing projections of disposable incomes of households, corporations and government, based on the social accounting matrix. This method derives a projection of incomes by transforming value-added levels by industry into incomes of factors of production and, further, by converting factor incomes into incomes of institutions (households, corporations and government). The technique can also be used to project per capita and per household indicators of household disposable income.

Two techniques for projecting household consumption and savings are described. One method is patterned on the demand systems of the Kelley and the Bachue-Philippines models. The method postulates that household demand is primarily a function of income and demographic variables. The other technique draws on the Linear Expenditure System and the Extended Linear Expenditure System. These systems are based on the assumption that household consumption demand is primarily a function of income and prices and to a lesser extent of demographic variables. Each of the two methods is capable of generating the level and structure of household consumption by commodity groups as well as the level of household savings.

Lastly, this volume describes a technique, based on the methodology of the Long-range Planning Model 2, for preparing projections of government consumption and investment relating to education, health and housing (U.S. Bureau of the Census, 1972). The technique projects levels of government consumption and investment by calculating the resources needed to cover the operating costs along with investment costs of those sectors.

3. Structure of the methodological chapters

Each methodological chapter is devoted to one technique. The chapter provides an overview of the technique and discusses its strengths and weaknesses as a planning tool. Then, it describes the principles of the technique, stressing the various computational steps followed in applying it. The chapter further discusses the inputs used with the technique and suggests how they can be prepared. It concludes by presenting and describing one or more illustrative applications of the technique.

The emphasis in these chapters is on the technical description of the methods, the requisite inputs and the illustrative applications of the methods. Discussions on the preparation of inputs are less fully developed since the preparation of inputs, which include data collection and processing as well as estimation of various coefficients and parameters, is a broad area in its own right.
Box 6

Glossary

Capital stock
The total amount of machines, equipment and buildings, as well as inventory existing at any one time in a firm, industry or economy.

Disposable income
The income of a particular type of institution, such as household, corporation or government, after taxes or transfers, whichever is appropriate, which is available for consumption or savings.

Factor income
The income accruing to a particular factor of production in return for services rendered by that factor. Examples of factor incomes are capital income and labour income.

Factors of production
Resources or inputs required to produce a good or service. Basic categories of factors of production are land, labour, and capital.

Household consumption demand
The amount of money that households are willing to spend on final goods and services over a specified time period to meet various consumption needs.

Investment costs
Costs incurred in connection with accumulating inventory, installing new equipment or facilities and/or replacing the existing ones.

Operating costs
Costs incurred in connection with production of goods or services, which vary with the level of output. Examples of this type of cost are costs of labour, raw materials and power.

To facilitate understanding, each chapter includes a list of indices, variables and special symbols along with their definitions. Also, each includes a list of equations used in describing the principles of the technique in the chapter. Moreover, definitions of the various technical terms used in the methodological chapters are presented in a unified glossary at the end of each module.
Each methodological chapter contains one or more illustrative examples of projections. The examples are presented in order to: (a) illustrate the types of inputs required to apply various methods; (b) show how the requisite projection calculations are actually performed; and (c) illustrate the results that the methods are capable of generating. Often, examples are presented that illustrate projections at both national and urban-rural levels.

The inputs needed to make specific projections, in turn, require projections made by other methods described in the volume. In view of this, illustrative inputs presented in various chapters include, among other things, the results of illustrative projections prepared with other methods. Thus, illustrative inputs relating to examples of projections of households, labour force or household consumption and savings include relevant results of illustrative population projections. Though the illustrative inputs and projection examples provided throughout the volume try to present a set of examples resembling projections that would be prepared in a concrete planning exercise, it was, however, not possible to fully integrate all the various examples in this fashion.

Since the proposed methods are expected to be useful in medium- and especially long-run planning, they have been described as tools for making quinquennial rather than annual projections. Consequently, the results that they can generate are for dates spaced five years apart and for the intervening time intervals. However, without any modification, a number of methods could be used in preparing annual projections if the inputs are provided on an annual basis. Alternatively, annual projections can be derived from the quinquennial projections through interpolation.

C. Using the methodology

1. Some general observations

The methodology of this volume would normally be used to sequentially project a number of variables, since the projection results obtained by some methods are inputs into projections prepared by other methods. Thus, for example, the use of the cohort component method would precede that of the enrolment ratio technique or the headship rate method, since population projections are needed as inputs for making school enrolment or household projections.

Most of the proposed techniques enable one to make urban-rural projections, which may be more useful in planning than projections made for the country as a whole. The principal reason for this is the urban-rural dualism, which is typical of both economies and populations of developing countries. In particular, in long-term planning exercises in countries undergoing rapid changes in the economic structure and population distribution, it would be impossible to capture the effects of this dualism adequately unless the projections allowed for the urban-rural breakdown.
In most applications of the proposed methodology, it will probably be necessary to use the techniques in an iterative fashion in order to reduce inconsistencies among projections. For example, iterations would be required where labour force and employment projections prepared for urban and rural areas indicate sizeable imbalances between labour supply and demand. In particular, if imbalances appear to be a consequence of unrealistic urban-rural migration assumptions underlying the population projection, these assumptions would have to be reformulated and new population and labour force projections made until the imbalances were removed.

The application of this methodology in comprehensive development planning may encounter a variety of constraints in developing countries. These constraints may derive from data limitations or lack of sufficient expertise to prepare requisite projection inputs. In addition, they may stem from a limited access to computing facilities or assumptions embodied in some techniques that may prove overly restrictive.

2. The role of the proposed methodology in planning

The role that the methodology of the present volume may play in planning could be visualized by considering: (a) socio-economic and demographic projections that are essential to comprehensive planning; (b) interdependences among socio-economic and demographic projections; and (c) how those projections can be used in planning. Among the projections in question are those of the groups of variables shown in box 7. The variables indicated by an asterisk enclosed in parentheses (*), can be projected fully, or in part, by the methodology of this volume.

As suggested by the number of variables marked by an asterisk, this methodology can contribute a great deal to planning. However, the techniques described in this volume represent only part of a broader planning methodology, which can yield projections that are very much interdependent. The interdependencies among those projections are essentially of two types. First, the projections of a number of variables could not be undertaken unless projections of other variables were already made. And second, a number of projections must be checked against each other for consistency. This applies to most variables involved in comprehensive planning, whether or not they can be projected with this methodology.

These two types of interdependencies are illustrated in figure 1. The projections of the variables listed above are displayed in rectangles, which are interconnected using three different types of arrows. The projections represented by 'single-line' rectangles can be prepared with the methodology of this volume. Those represented by the 'double-line' rectangles cannot be made with this methodology and require other techniques, many of which are routinely used by planners.

The solid and dotted arrows indicate dependencies of projections of given variables on the projections of other variables. In particular, any solid arrow shows that a projection of a particular variable must use as one input
Box 7

Variables to be projected in comprehensive development planning

(1) Variables relating to supply or production of commodities:
   Value added
   Intermediate inputs
   Total production

(2) Variables relating to demand or use of commodities:
   Final demand (*)
   Intermediate demand
   Total demand

(3) Variables relating to supply or availability of services of factors of production:
   Capital stock
   Cultivable land
   Labour force (*)

(4) Variables relating to demand or use of services of factors of production:
   Capital use
   Land use
   Employment (*)

(5) Variables representing different types of disposable incomes of institutions:
   Household income (*)
   Corporate income (*)
   Government income (*)

(6) Variables relating to the disposition of disposable incomes:
   Household consumption and savings or investment (*)
   Government consumption and investment (*)
   Corporate investment

(7) Variables relating to population and its constituent functional groups:
   Total population (*)
   Young-age population (*)
   Working-age population (*)
   Old-age population (*)
   School-age population and students (*)
   Women of the childbearing period (*)

(8) Variables relating to households:
   Total number of households (*)
   Average household size (*)
Figure I. Projections of socio-economic and demographic variables in comprehensive development planning
the results of a projection of some other variable. Any dotted arrow indicates that a projection of a given variable may require the use of a projection of some other variable, but whether or not this is actually necessary depends on the type of technique used or inputs selected. Each dashed arrow indicates the need for consistency checks between projections of any given pair of variables.
References


