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**GENERAL PRINCIPLES FOR
NATIONAL PROGRAMMES OF
POPULATION PROJECTIONS AS AIDS
TO DEVELOPMENT PLANNING**



UNITED NATIONS

Department of Economic and Social Affairs

POPULATION STUDIES, No. 38

**GENERAL PRINCIPLES FOR
NATIONAL PROGRAMMES OF
POPULATION PROJECTIONS AS AIDS
TO DEVELOPMENT PLANNING**



UNITED NATIONS

New York, 1965

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NOTE

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Selected list of demographic publications of the United Nations will be found at the end of the study.

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FOREWORD

In response to the growing recognition of the importance of adequate demographic information in social and economic planning, the Population Commission at its eleventh session (1961) expressed its interest "... in the development of standards for national work on population projections, suited to the needs of developmental planning" 1/ and requested the preparation of

"... a set of proposals for such standards, including indications of the types of population projections which are most useful for economic and social planning and policy-making and for other purposes, classifications which it is most useful to include in projections, the time-span of projections, the utility of preparing alternative sets of projections corresponding to alternative assumptions regarding the future trends of the demographic factors, and indications of the types of data and other information needed as a sound basis for population projections." 2/

Accordingly, the Secretary-General presented a draft statement on this subject (E/CN.9/170) to the Population Commission at its twelfth session (1963). After reviewing the draft, the Commission expressed the opinion that it

"... would be especially useful as a guide for the developing countries and ... would be helpful to Governments in making the most effective possible use of resources available for analytical work in this field. It Population Commission agreed that the standards should not aim to achieve international uniformity, which would hardly be feasible in view of differences between countries in requirements for population projections and the means available for meeting these needs. At the same time, it recognized the merit of maintaining international comparability to the degree compatible with the differences in national needs and resources." 3/

The Commission went on to request the Secretary-General to circulate the statement widely for comment by international and national agencies and institutions and by individual experts and to present at the Commission's thirteenth session a revised text taking account of the comments received as well as the views expressed by the Commission at its twelfth session. 4/ The present document has been prepared in accordance with this request.

During 1963 and 1964, the Secretary-General sent copies of the draft statement (E/CN.9/170) to numerous agencies, institutions and experts in various countries, with an invitation to comment on it. Comments and suggestions were received from more than eighty agencies, institutions and experts and these have been taken into account in the preparation of the present text.

1/ Official Records of the Economic and Social Council, Thirty-first Session, Supplement No. 3, para. 51, p. 8.

2/ Ibid.

3/ Ibid., Thirty-fifth Session, Supplement No. 2, para. 28, pp. 5 and 6.

4/ Ibid., paras. 28-29, pp. 5-6.

The Statistical Commission at its twelfth session also expressed an interest in the development of standards for population projections. 5/ This is in line with a more general interest, expressed by the General Assembly and the Economic and Social Council at recent sessions, 6/ in promoting and assisting the preparation of economic and social projections and improvement of the techniques and reliability of projections as aids to planning of developmental programmes.

Work in this field is co-ordinated by an Economic Projections and Programming Centre established in 1962 within the Secretariat at United Nations Headquarters, pursuant to General Assembly resolution 1708 (XVI). One of the objectives of the Centre is to ensure a unified methodological approach and an optimum utilization of resources in work on projections and planning. Before the Economic Projections and Programming Centre was established, some inter-agency meetings were held under the aegis of the Administrative Committee on Co-ordination, for discussion of questions of co-ordination of work on projections. Some preliminary indications of standards for population projections were drawn up at these meetings; they have been taken into account in the present document.

5/ Official Records of the Economic and Social Council, Thirty-fourth Session, Supplement No. 13, para. 80 (resolution 8 (XII)), p. 13.

6/ See Official Records of the General Assembly, Fifteenth Session, Supplement No. 16 (A/4684), resolution 1517 (XV), p. 10; Ibid., Sixteenth Session, Supplement No. 17 (A/5100), resolution 1708 (XVI), pp. 15-16; Official Records of the Economic and Social Council, Thirtieth Session, Supplement No. 1 (E/3422) resolution 777 (XXX), p. 3; Ibid., Thirty-fourth Session, Supplement No. 1 (E/3671), resolution 924 (XXXIV), p. 10.

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I. PURPOSE AND SCOPE

1. The aim of this document is to set forth some general principles that will be helpful to government agencies and research institutions in directing their work so that they can meet, with existing data and other resources, the most essential demands of population projections for purposes of economic and social planning. Both the requirements of population projections and the available resources to satisfy these needs differ from country to country, and uniform prescriptions would not be suitable for all countries; therefore, the guiding principles stated here are formulated in such a way that they can be adapted in each country to national needs and available resources. These principles will also help to achieve as much international comparability of projections as is compatible with existing differences in national needs and resources.

2. The general principles set forth here do not deal with details of the methods of population projections. Technical manuals on methods of making some of the types of projections considered here have been published by the United Nations ^{1/} and it is proposed to publish additional methodological manuals in the future. Some other works pertinent to methods of population projections are cited in the bibliography included in this document (Part IV).

3. Also excluded from consideration here are the methodological and other problems of analysing and evaluating results of population censuses and other demographic data required as a basis for population projections. These problems have been the subject matter of several publications of the United Nations. ^{2/}

4. Projections of needs for different goods and services (food, housing, schools, teachers' services, health services, etc.) are not considered here, although population projections constitute an essential part of the basis for projections of such needs. The links between population growth and structure, on the one hand, and changing needs for goods and services on the other, have been discussed in general terms in a previous United Nations study. ^{3/}

1/ Manuals on Methods of Estimating Population, United Nations publications. Manual I, Methods of Estimating Total Population for Current Dates, Sales No.: 52.XIII.5; Manual II, Methods of Appraisal of Quality of Basic Data for Population Estimates, Sales No.: 56.XIII.2; Manual III, Methods for Population Projections by Sex and Age, Sales No.: 56.XIII.3.

2/ National Programmes of Analysis of Population Census Data as an Aid to Planning and Policy-making (United Nations publication, Sales No.: 64.XIII.4); Seminar on Evaluation and Utilization of Population Census Data in Latin America, Santiago, Chile, 30 November - 18 December 1959 (E/CN.9/CONF.1/1/Rev.1); Seminar on Evaluation and Utilization of Population Census Data in Asia and the Far East, Bombay, India, 20 June - 8 July 1960 (E/CN.9/CONF.2/1); Case Studies of Arrangements for Evaluation and Utilization of Population Census Results: Report I. The Sudan; Report II. The Republic of Guatemala; Report III. The Republic of Ecuador; Report IV. Japan; Report V. Iran (ST/SOA/SER.R/I-5), respectively.

3/ The Aging of Populations and its Economic and Social Implications, United Nations publication, Sales No.: 56.XIII.6.

II. GENERAL CONSIDERATIONS

A. The role of population projections in economic and social planning

5. The designation of the 1960's as the Development Decade reflects the determination of the less advanced countries of the world to accelerate their social and economic development and to achieve with a minimum of delay a satisfactory level of living compatible with the potentialities of contemporary knowledge and technology. In pursuance of this objective, the Governments of these countries have recognized the necessity of actively promoting economic and social processes by setting specific goals of public policy and by making concrete, comprehensive plans for the achievement of these goals.
6. Such planning presupposes some understanding of the relationship among the interacting variables which contribute to demographic social and economic changes. A first step in planning, therefore, is to study relevant aspects of the population, society and economy both in the contemporary phase and in the recent past. Such study provides a basis for projections representing plausible future courses of development under the assumption that future conditions will evolve in an orderly manner from those of the present and past. While government policy is one of the factors to be considered in working out these projections, it is assumed at this stage that policy will not be influenced by the results of the projections. A policy appropriate for directing development towards goals that are adequate and within the realm of possible achievement may then be arrived at by successive approximation, various alternative sets of development goals being superimposed on the basic projections. After an analysis of the adjustments and changes required for the realization of each set of goals, decisions may be made on the goals to be incorporated into the development programme.
7. The logistics of planning relate to the use and distribution of different amounts and kinds of labour supply, raw materials, other natural resources, capital and capital equipment. Projections provide a quantitative basis for the logistics of planning as well as for the establishment of goals. By projecting relevant factors (such as quantities of manpower at certain educational levels) into the future, under the assumption of no major change in government policy, the comparison with requirements for the realization of given goals can be made in numerical terms, and the plans for accomplishing the necessary adjustments can be stated.
8. After the adjustments and corresponding changes in government policy are decided upon, the projections must be revised. In any event, projections should never be considered as final; they are always subject to revision. They must be checked and adjusted constantly in view of the unfolding course of events. At the same time, the factors contributing to errors of projection should be examined and changes in the relevant policies made where necessary.
9. The role of population projections in planning economic and social development is twofold. On the one hand, population plays a major part in determining labour supply, an essential factor in the production of all goods and services, while on the other hand, it defines the number of consumers, the satisfaction of whose wants

is the ultimate aim of production. Thus population projections are an essential basis both for estimating the productive capacity and the needs of a nation in the future.

10. Planning for social and economic development involves the allocation of capital resources among a multitude of competing demands. Some investment of capital in improving the quality of population considered as human resources is usually a prerequisite of economic growth. The necessary amount of investment, for example, in educational services for meeting skilled labour requirements can be estimated by matching a projection of educational levels of the labour force (assuming no change in present educational and budgetary arrangements) with a projection of labour demand by levels of education corresponding to the fulfilment of production goals. The availability of the workers needed to achieve the goals must be evaluated with reference to demographic factors. The costs of establishing and maintaining the necessary educational and training facilities may then be estimated.

11. The allocation of capital resources to the production of consumers' goods and services, in so far as any consequent change in consumption does not affect labour productivity, must be considered as an expenditure rather than an investment in the balance-sheet of economic development. Therefore, the extent to which the satisfaction of consumers' wants may be deferred in the interest of rapid economic growth must be considered. Projections of more or less essential wants, based on population projections together with other information, are helpful in arriving at such decisions of national policy.

12. In an increasing number of developing countries, measures aimed at modifying the trends of population and, thereby, influencing the future growth of consumers' needs and the labour force as being considered as essential parts of national programmes of economic and social development. In this case, population projections are not merely taken as a given basis for the development plan, but represent a factor which may be changed, within limits, by planned action. The possible effects of various types of investments (in health services and educational facilities, for example) upon the projected population trends then take on importance as a criterion of investment policy.

13. It is important to recognize the limitations of present knowledge about the factors which influence demographic, economic and social changes and their interactions. Although some progress has been made in the study of these questions, especially in some of the industrialized countries, much work remains to be done before such knowledge will be sufficient to provide a firm basis for projections. The limitations of knowledge with regard to pertinent factors and relationships in developing countries require special emphasis. Much uncertainty is attached to projections for such countries that are based on assumptions derived from the experience of more developed countries in different cultural settings. Accurate forecasting, both of population and of economic and social changes, is utopian in any circumstances. Nevertheless, the importance of the role of demographic and other projections in economic and social planning justifies the effort to make the best projections possible within the limits of existing knowledge and available resources.

B. Main types of population projections needed in economic and social planning

14. Needs for various types of population projections in connexion with economic and social planning differ from country to country, depending on the methods of planning and the level of development already achieved, as well as on the country's demographic, economic and social characteristics. The possibilities of making useful projections of each type also vary, depending on the basic data available, the extent of research which has been done, and on the personnel and other resources that can be devoted to this work. Where an attempt is made to draw up a detailed blueprint of a planned course of development, a relatively wide variety of projections will be needed, and relatively varied and detailed classifications of characteristics will be desired in each type of projections. On the other hand, only a modest programme of projections can be undertaken in a little-developed country where existing statistical materials are rudimentary, where little fundamental research has been done on population trends and their interrelations with economic and social factors, and where few trained workers are available for activities in this field.

15. In spite of variations in needs and possibilities for population projections, it is possible to specify some principal types that are highly valuable, so far as it is possible to produce them, as aids to economic and social planning under the conditions existing in many countries. Among these are the following types:

- (a) Total population;
- (b) Labour force;
- (c) School-age population and school attendance;
- (d) Population by educational level;
- (e) Households and families.

16. The principal uses of each of these types of projections for economic and social development planning are indicated in Part III of this document, where principles are outlined for projections of each type. It is appropriate here to call attention to the fundamental importance of the projection of total population by sex and age as a basis for other types of population projections, in addition to its direct uses in estimating needs for various kinds of consumer goods and services. The projection of a country's total number of inhabitants is ordinarily obtained by summing up separate projections for different sex-age groups. Furthermore, the sex-age projection is ordinarily used as a basis for projections of the labour force, school-age population and school attendance, educational levels of population and labour force, and often as a basis also for projections of households and families. Therefore, the first step in a national programme of population projections should ordinarily be to establish the fundamental projection of total population by sex and age, if the basis for this projection exists.

17. In addition to the five main types of population projections listed above, there are other types which may be important and feasible for some countries. For example, it may be desired to make projections of the population depending upon agriculture, possibly with a distinction between traditional or "subsistence" agriculture and modern or commercial agriculture. Such projections, where they

are feasible, may be of great value in planning for redistribution of the labour force among sectors of the economy and in estimating future trends of production and consumption. Projections of different ethnic groups of the population are important in development planning for some countries, and in some cases separate projections for ethnic groups may be helpful in arriving at the best possible projections of total population. Another type of projection often desired is the number of married persons by sex and age groups, which is useful for several purposes, including projections of labour force, households and families, projections of fertility trends and estimates of possible effects of policy measures aimed at influencing the birth rate through changes in age at marriage. Principles for these types of projections are not included in the present document, not because they are considered unimportant but because they are not so commonly required and the basis for them does not exist in as many countries as in the case of the five principal types of projections listed above.

C. Area classifications

18. Population projections for a country as a whole are seldom sufficient to satisfy the requirements of economic and social planning. Several kinds of area classifications may be required in projections of each of the major types listed above.

19. The distinction between urban and rural areas is so fundamental in population projections that it is desirable to retain the urban-rural classification, so far as possible, throughout a programme of population projections of the types listed in paragraph 15, especially for countries where a considerable shift in the urban-rural distribution is foreseen. Urban and rural population projections are of special value for planning since urban and rural communities differ both in productive functions and in needs for such items as marketable food, housing, social services and utilities. This classification is important also for its role in the calculation of principal types of projections for the population of a country as a whole. Urban and rural communities generally differ significantly in levels of fertility and mortality and in patterns of participation in economic activities, school attendance, educational levels, and household or family formation. It is useful, therefore, to deal separately with the urban and rural sectors in making projections of the various types.

20. In most countries, there is also a need for separate projections of the population of the principal cities. These projections are useful in planning urban development programmes and other measures aimed at balancing the growth of the city population with expanding employment opportunities and with the means of satisfying the growing needs for goods and services. Projections of the population in urban localities classified by number of inhabitants are also useful for studying implications of trends in urbanization for national policy and planning. On the other hand, projections of the rural population living in the open country and in villages of different sizes may be instrumental in planning community development and other social service programmes.

21. It may also be necessary to make separate projections for administrative or economic regions of the country if they are separate units in the national development plan. Local projections are required if demographic factors are to be taken into account in making decisions on such questions as the location of industrial plants, housing projects, construction of new schools and hospitals,

public utility installations, etc. Although some of these matters may be the responsibility of local rather than national agencies, local needs for projections should be taken into account in drawing up a national programme of work in this sphere.

22. It is not practical, however, to carry out population projections for all component areas and localities of a country in the full detail which might be ideally desirable for planning purposes. This is impractical if only because of the amount of work involved and the limited number of persons with the necessary training and experience even in countries where demography is most highly developed. Moreover, projections for parts of a country are complicated by the factor of internal migration, which is more difficult to predict than the natural factors of population change and which may play a decisive part in determining the future trend of population in a city or region within a country. Lack of adequate information about internal migration and factors influencing it dictates greater caution in projections for parts of a country than in projections for the country as a whole. On this account, less detail would be justified in population projections for regions, cities, and localities, even if time and personnel were unlimited.

23. Broadly speaking, two different kinds of methods have been used for projecting the population of small areas within countries. One type of procedure consists in projecting the population of each area and then adjusting the results so that the sum of the area projections keeps pace with an independent projection of the population of the whole country or a major area. The other type of method consists in obtaining the projections for small areas by some kind of formula for distributing the projected population of the country or a major area among its component areas. The so-called "ratio method" provides one such formula. Since the first type of procedure offers scope for taking account of available data on pertinent characteristics and conditions in the various areas, it appears to be theoretically preferable. Multiple correlation analysis and econometric studies may find useful applications in projections following this procedure. On the other hand, practical considerations, including the availability of data, the advantage of uniform procedure, and the possibility of serving wider purposes may dictate the use of methods of the second type in many cases.

24. Special considerations relevant to the classification of areas in some types of population projections are mentioned in Part III of this document.

D. Classifications of characteristics

25. Various classifications by characteristics may be introduced into population projections of each type, to the extent that they are feasible and useful for planning or other purposes. In labour force projections, for example, classifications by sex, age, industry, occupation, status (as employer, employee, etc.) and level of education are generally useful if they can be provided. The most generally useful types of classifications by characteristics are indicated, with reference to each type of projections, in Part III, and principles governing the forms of such classifications are also presented.

26. In general, the varieties and degrees of detail of classifications by characteristics will depend on the needs (as determined in each country by the

methods of planning and the level of development already achieved) and on the means - that is, the basic statistics, research findings, and personnel available for projection work. For many developing countries, not all of the types of classifications by characteristics mentioned in Part III would be either necessary or feasible. It is hardly necessary to point out that there is little place in a programme of projections for classifications by types of characteristics which are not found in the basic demographic statistics of the country. For example, if the age-distribution of the labour force at present - or at the latest census date - is not known, an attempt to introduce this classification into labour force projections is scarcely warranted.

27. The forms of classifications in projections should conform to those used in the current and historical statistics of the country. The use of different forms of classifications will result in burdensome methodological complications as well as a reduction in accuracy. Subject to this limitation, the categories identified in such classifications should provide, so far as possible, both efficient descriptions of the actual national situation and groupings pertinent to practical considerations of planning and policy-making. For example, if at least three years of schooling are assumed to be the minimum required to play a certain role in the economy of the country, the categories should make it possible to separate those having completed three or more years of school from those not having reached this level.

28. Due consideration should be given to the advantages of international comparability in the forms of classifications where it can be maintained without prejudice to national needs. Useful information on underlying functional relationships can often be obtained by referring to the experience of other countries in similar circumstances. Such comparisons are handicapped unnecessarily when the forms of classifications used in a country depart from international standards without valid reasons. In this document, the forms of classifications proposed are consistent with those used in the United Nations Principles and Recommendations for National Population Censuses. 4/

E. Time-span of projections

29. Little useful purpose is served by extending projections farther into the future than is necessary for drawing up development plans and taking decisions on related questions of policy. The useful time-span will vary with the subject of the projection and its intended use. For example, in estimating the capacity of a water-supply installation necessary to meet the needs of a growing city, it is useful, if possible, to take a rather long view of the future; whereas a shorter-range projection may be adequate as a basis for planning investments in new housing construction over a period of a few years. Projections of relatively long-range character are needed when measures of population policy are being considered, since efforts to influence population trends may require a relatively long time to take effect and, once they have taken effect, their influence is unlikely to be temporary.

30. In drawing up a national programme for work on population projections, the time-spans for the different types of projections should be chosen with an eye to

4/ United Nations publication, Sales No.: 58.XVII.5.

the maximum requirements for their principal uses. It should be taken into account, however, that reliability diminishes as the time-span lengthens; projections over a very long span are therefore of dubious utility for any kind of planning or policy-making. The relationship between time-span and reliability differs according to the topic of the projection and the age-groups of the population which it involves. For example, projections of the size of the labour force can be carried reliably over a longer time-span than those of school-age children. While the uncertainty of predictions of future mortality trends affects projections for all age groups, projections of the child population extending more than a few years into the future are subject to the additional uncertainty of predictions of the future numbers of births. The latter factor of uncertainty is especially important in countries where large changes in the birth rate have taken place in the recent past. The advisable time-span for a projection also depends on the quality of the data used and the degree of confidence that can be placed in the assumptions adopted. In general, the weaker and more uncertain the basis, the shorter the time-span should be.

31. Population projections over a span of twenty or twenty-five years are ordinarily sufficient to meet the principal requirements of planning for economics and social development. Special considerations relating to the time-span of projections of certain types are stated in Part III below.

F. Alternative sets of projections

32. In selecting the assumptions on which population projections are to be based, it is desirable to consider not only the course of future events which appears most likely judging from past experience and other considerations, but also to take account of alternatives which do not appear to be outside the limits of plausibility. As a rule, it is useful to work out projections of each type on the basis of several alternative sets of assumptions, in such a way as to obtain indications of the reliability of results and ranges within which the future numbers are likely to fall. In the publication of results, however, it is ordinarily not desirable to retain a large number of such alternatives. Three projections of each type will ordinarily be sufficient for publication: a projection designed to represent the most plausible future course of development and "high" and "low" variants designed to delimit a plausible range of variation. ^{5/}

33. It is difficult to make generalizations concerning the types of assumptions to be adopted for the most plausible "high" and "low" projections, or the criteria of plausibility to be applied. Little practical purpose is served by presenting alternative sets of projections in which the figures either vary over an extremely wide range or differ only slightly. If all plausible variations of assumptions lead to nearly the same results, there is no need for alternative sets of projections. On the other hand, if the range of plausible possibilities is extremely wide, little value can be attached to any projection. It should be noted that the set of projections thought to correspond to the most likely course of events is not necessarily the best choice as the basis for planning particular types of developmental programmes. In some cases, it may be the part of wisdom

^{5/} The "most plausible" projection will not necessarily represent an average of the "high" and "low" variants; it may, in some cases, be placed near the upper or lower limit of the plausible range.

to base plans on "high" projections in order to minimize the risk of making inadequate provisions for future needs, while, in other cases, it may be discreet to take "low" projections as the basis.

34. Where a Government faces alternatives of policy with regard to types of economic and social action which may influence the trends of population, it is sometimes useful as an aid in reaching a decision to prepare alternative sets of population projections corresponding specifically to these alternatives of economic and social policy. In particular, this may be useful for decision-making with regard to questions of population policy.

G. Revision of projections

35. Since projections should never be considered final, it is important to provide for their revision. At regular intervals, or whenever new data become available, population projections should be examined in relation to the actual course of events and revised where necessary. A procedure should be established for making such periodic examinations and revisions of the projections, and provision made of personnel for this purpose.

36. The conditions under which a revision may be considered advisable are not the same for short-term and long-term projections. In the case of long-term projections, a revision should be made only when there is evidence to suggest that the assumptions with regard to long-term future trends of fertility, mortality, or migration are no longer the most appropriate ones. In arriving at a judgement on this question, it is necessary to analyse variations in the current trends of these components, with a view to separating short-term variations from changes in the long-term trends. Such an analysis requires data for several years and in many cases it cannot be completely carried out until the results of a new census are available. On the other hand, short-term projections, which are intended to follow more closely the unfolding sequence of current developments, should be revised as necessary whenever new data become available, preferably on a year-to-year basis.

H. Requirements of data for population projections

37. Population projections of each type can be made by various methods requiring different kinds and amounts of data. The data required in the use of the principal methods for projections of each type are outlined in Part III.

38. For countries with well developed current and historical statistics of good quality, it is possible to use relatively refined methods of projection. These yield more detailed and possibly more reliable results than can be obtained by simpler methods. For example, the "component" method of projecting population by sex and age groups requires data on sex-age structure of the population at the beginning date and satisfactory current measures or estimates of the functions of fertility, mortality, and net immigration or emigration. Where these data requirements are met, the "component" method is generally considered to be the best method of projecting not only sex-age groups but also the total number of the population. But where such data are lacking, it may be possible to make a useful projection of the total population by simpler methods, such as projecting a growth-curve fitted to a historical series of data on the total number of inhabitants. However, it is necessary to emphasize the dangers of relying on estimates obtained

by methods of the latter type, especially in the case of countries where even the statistics of total population are unreliable or lacking for long periods. In any case, every effort must be made to ascertain the current levels of fertility, mortality and migration.

39. Quality is an essential aspect of data requirements for population projections. Thorough testing of the quality of basic data by all available means and the correction of errors is an indispensable first step in making projections. Uncorrected errors in the data will be reflected in the projections and often magnified progressively as the projection is carried into the future. However, there may be circumstances in which it is not advisable to correct basic data. For example, the estimate of the error may itself have a doubtful basis or be too small to justify a correction. Administrative and political difficulties may be involved in changing official statistics, especially census counts of the total population in a country or its parts.

40. Mediocre or uncertain quality of basic data is cause for adopting a conservative policy with regard to the time-span of projections, the number of classifications introduced and the degree of detail in classifications. The futility of elaborate techniques of projection should also be noted in those cases where achievement of high quality in results is precluded by deficiencies of the basic data and lack of adequate knowledge of the pertinent factors and relationships. Data grossly deficient in quality or a total lack of essential data are cause for forgoing projections until an adequate statistical basis has been established. It is not recommendable, however, to defer work on projections immediately needed for planning until a high degree of perfection in the basic statistics has been attained. The development of population projections should go hand in hand with the development of statistical sources. A provisional set of the most essential projections should be worked out as soon as a sufficient basis exists. The projections can then be extended and improved in quality as the development of statistics progresses.

41. Research as well as statistics is an essential part of the basis for satisfactory projections. It is research on the interrelationships of fertility, mortality, migration, and population structure with economic, social and other factors that makes it possible to select assumptions as to the future trends of demographic variables. As already pointed out, present knowledge of these interrelationships is very imperfect. The development of fundamental demographic research should therefore go hand in hand with the development of projections and their applications in planning.

I. Organization of work on population projections

42. It is advisable to plan and organize the work on all major types of population projections as a single, unified programme. This is advantageous because of the connexions between the different types of population projections and the central position of the projections of population by sex and age as a basis for other types.

43. For the sake of technical efficiency as well as unity, there is an advantage in centralizing the work on population projections in one agency of the Government or in one research institution. Arrangements should be made for regular consultations with agencies and institutions interested in applications of population projections and those engaged in making other kinds of projections in

economic and social fields, and for constant, close co-operation with agencies and institutions having responsibility for the collection, evaluation and analysis of demographic statistics.

44. In planning a programme of work on population projections, priorities must be set with regard to the order of work on the different types of projections and the amounts of time and resources to be devoted to the work on each type. Of course, an important consideration in setting these priorities is the demand for projections of each type in connexion with economic and social planning and work in other fields. But it is necessary, for the sake of efficiency and quality of results, to take account of the needs for one type of projection in carrying out projections of other types. This consideration is pertinent not only to the priority assigned the fundamental projections of population by sex and age groups but also to that of certain other types of projections. For example, projections of population by educational level are required as a basis for projections of the labour force by educational level.

45. Since population projections are ordinarily intended to be used by agencies, institutions, and individuals other than the makers of the projections, reports presenting the results should state clearly what data, methods and assumptions were used and give any additional information needed to assure proper interpretation and applications of the results.

III. TYPES OF POPULATION PROJECTIONS

A. Total population

1. Utility

46. As already stated, projections of a country's total number of inhabitants are usually obtained by summing up projections for males and females in different age groups. Total population projections are useful in many types of statistical calculations relevant to planning. Given, for example, the projected number of a country's inhabitants and a measure of adequate consumption of any given product per head, the future needs for consumption can be estimated. Conversely, given the projected total population and proposed goals for production of various consumer goods and services, the adequacy of these goals can be assessed. An illustration of this principle is the use of the population projection to convert gross or net national income into a measure of income per head, and thus to evaluate progress in economic development expected to be achieved by fulfilment of a national plan.

47. Projected numbers of persons in various sex-age groups not only provide the basis for total population projections but also for most other types of demographic projections; moreover, they are themselves of great value for many calculations pertinent to economic and social planning. For example, future needs for a great variety of goods and services can be estimated more accurately by taking the sex-age composition of the population into account than by considering only the anticipated total number of inhabitants. In fact, many goods and services are consumed almost exclusively by particular sex-age groups. Sex and age are such important distinguishing factors with regard to so many economic and social activities (e.g., labour force participation, school attendance, household and family formation, participation in social security schemes) that anticipated changes in the sex-age composition of the population should, wherever possible, be explicitly brought into the projection procedure even where the projected population totals are not derived from separate projections for sex and age groups.

2. Time-span

48. In deciding the time-span over which population projections by sex and age are to be carried, their use as a basis for other types of projections should be considered as well as the requirements of total population and sex-age projections from various planning purposes. The time-span of projections by sex and age should be at least as long as the maximum span of other demographic projections to be derived from them.

3. Areas

49. An urban-rural classification in population projections by sex and age is highly recommended, and sex-age projections for principal cities and major

administrative divisions of the country are also likely to be required, if only as a basis for other types of demographic projections for such areas, which are of great importance in planning.

50. In addition, local population projections, even for such small areas as municipalities and parts of cities, are important for many types of planning. However, it is commonly impractical to carry out projections for such areas by sex and age and therefore simpler methods for obtaining necessary projections of total population in such areas are required. In the absence of more detailed information, needs for various items such as schools, housing, etc., may be assumed to vary in proportion to projections of total population for purposes of local planning.

4. Classifications of characteristics

51. The classifications suggested as standards are:

Sex: male and female

Age: Under 1 year, 1-4 years, 5-9 years, etc., by 5 year groups to 80-84, 85 years and over.

52. Sometimes the available data will permit the calculation of more reliable projections when individuals are classified in age groups other than the quinquennial ones. When the available data warrant it, projections for smaller age groups or single years should be made. Single-year estimates are particularly useful for those ages at which important changes usually occur in the participation of the individuals in the economic and social life of a nation.

5. Data required

53. Various definitions of persons to be enumerated (de facto or de jure, total or civilian population, etc.) are used in the censuses of different countries. In making population projections, the census definitions should be taken into account and adjustments may be required if it is desired to make the projections conform to a different definition.

54. Adjustments must also be made in order to obtain projections of the total population where the basic statistics do not include certain population groups. For example, the census results for several Latin American countries do not include detailed statistics for certain non-integrated groups of aboriginal population, the numbers of which are roughly estimated. In such circumstances, it may be advisable to make separate projections for the population covered by the census and for the groups not covered. Crude, simple methods of projection may suffice for the latter groups.

(a) Data for projections by sex and age

55. An essential requirement for a projection of population by sex and age is, of course, data on the sex-age composition of the population at the base date. If

these data are not given in the desired form with regard to the details of the age classification, they may be converted by the use of interpolation formulae or suitable models. ^{6/}

56. The standard method of sex-age projections, where the necessary data are available, is the "component" method. ^{7/} The number of males and females in each age group at the base date are taken as the basis for estimating the number of survivors in successively higher age groups at successive future dates. The size of each future generation of births is estimated by applying projected fertility rates to the number of women in the child-bearing age groups. Estimated net additions or subtractions through migration may also be taken into account. For such a calculation, the following ancillary projections of demographic factors are required:

- (i) Projected sex-age-specific survival rates (or mortality rates);
- (ii) Projected age-specific fertility rates (or sex-age adjusted birth rates);
- (iii) Projected net migration and its distribution by sex and age (or sex-age-specific net migration rates), if migration on a significant scale is anticipated.

57. As a starting point for the projections of mortality and fertility, a measure or estimate of the initial level of each of these factors is required. The basis should preferably be sets of current sex-age-specific mortality rates (or survival functions of a current life table) and current age-specific fertility rates for women in the child-bearing age groups, derived from accurate birth and death registration statistics. Data in these forms are not indispensable, however. The calculations may start with indices of the general levels of mortality and fertility (current crude birth and death rates or estimates of expectation of life at birth and gross reproduction rate). The desired specific rates may then be estimated with the help of models (such as the United Nations model life tables and model age-patterns of fertility rates), taking into account the data on sex-age composition of the population. ^{8/} If reliable birth and death registration statistics are lacking, estimates of the necessary fertility and mortality indices may be obtained by means of sample surveys or derived from census data on sex-age composition of the population. Satisfactory estimates of the fertility level

^{6/} Further consideration of this question can be found in Manuals on Methods of Estimating Population, Manual III, Methods for population projections by sex and age (United Nations publication, Sales No.: 56.XIII.3), Chapter II, Estimation of base population by sex and age.

^{7/} Ibid., p. 2.

^{8/} Models are presented and their use illustrated in ibid., p. 36.

can often be derived from the sex-age data of a single census or demographic sample survey; mortality estimates generally require a comparative analysis of data from two or more censuses. 9/

58. In formulating assumptions with regard to future changes in the mortality and fertility rates, it is helpful to have historical series of statistics serving as a basis for study of past trends in the mortality and fertility levels and past tendencies of change in the sex-age pattern of mortality and age pattern of fertility. Such historical data are not indispensable; and if available, they are not necessarily sufficient as a basis for satisfactory projections. As far as mortality is concerned, continuity of future trends with those of the past is not to be expected where, as in many developing countries, far-reaching public health programmes have profoundly altered the conditions of mortality in the recent past, or may be expected to do so in the near future. In these circumstances, a better basis for future expectations in regard to the trend of mortality rates may be found in the experience of countries having undergone such changes in health and mortality factors. 10/ An additional means of strengthening the basis for mortality and fertility forecasts is the study of differences in mortality and fertility of social and economic groups, regions of the country, etc.

59. In the case of fertility, especially in countries where fertility is currently high and there is no evidence of a downward trend having become established, it is important to assess as thoroughly as possible the likelihood of future changes resulting from planned or anticipated changes in social and economic factors such as urbanization, rising levels of education, increasing income per head, public health programmes, etc., as well as anticipated effects of any population policy measures which may have been instituted or may be contemplated. In addition to the experience of other countries, data on differences of fertility among social and economic groups of the country's population are relevant to this question; besides data from studies of attitudes and behaviour patterns relating to fertility. 11/ Where health conditions are relatively poor and improvement in this respect is anticipated for the future, the possibility of fertility increasing as a result of this improvement should not be overlooked.

60. Data on international migration are an important requirement for projections only in the case of countries where there is reason to expect, on the basis of past experience or other indications, that migration may be a significant factor in the future population trend. For the majority of countries, this factor can be neglected without seriously prejudicing the reliability of projections.

9/ Methods of Using Census Statistics for the Calculation of Life Tables and Other Demographic Measures (with Applications to the Population of Brazil), United Nations publication, Sales No.: 50.XIII.3.

10/ Manuals on Methods of Estimating Population; Manual III, Methods for Population Projections by Sex and Age, Chapter IV.

11/ Ibid., Chapter V.

61. Where immigration or emigration is a factor to be reckoned with, historical series of migration statistics, if available, should be studied in order to determine the long-range trends. Many countries, however, do not have satisfactory statistics of immigration and emigration. As a substitute in the case of immigration, more or less approximate indications may be furnished by census data on place of birth, place of previous residence, or nationality of persons residing in the country. Sometimes the statistics of foreign countries from which immigrants originate or to which emigrants go, are helpful in making or verifying estimates of migration. Estimates of net immigration or emigration during intervals between censuses may also be derived from the census counts of population in conjunction with data on births and deaths, provided that the accuracy of these data is established. Such estimates of net migration can also be worked out separately for sex and age groups if the data are available in suitable form, and a basis thereby obtained for estimating the sex-age distribution of net migration balances, which commonly cannot be reliably determined by means of current migration statistics. 12/

62. It must be emphasized that migratory movements are very difficult to forecast as they are conditioned by the economic, social and political situations of both the countries of immigration and emigration. For this reason, it is sometimes advisable to work out separate projections, including and excluding effects of anticipated migration.

63. Internal migration, on the other hand, is a major factor in almost all countries and has to be taken into consideration in urban-rural and other areal projections. The mechanics of making areal projections by the "component" method are identical with those of national projections, but it is more difficult to achieve a satisfactory standard of accuracy in areal projections, not only because of the greater importance of migration but also because data for areas within countries are often lacking or given in less detail than national data. Furthermore, in the absence of satisfactory registration data, the levels of mortality or fertility for urban and rural sectors, cities, regions, etc., often cannot be estimated reliably from data on sex-age composition of the population because of the distorting effect of migration.

64. Census or sample survey data relating to internal migration are a very important part of the statistical basis for urban-rural and other areal projections. Such data, derived from inquiries on place of birth, duration of present residence, and place of previous residence, are materials for analyses of the magnitude, characteristics, and trends of migratory flows within the country. The analyses thereby made possible are invaluable aids in the selection of appropriate assumptions with regard to migration as a factor in future areal population trends. The value of these data in connexion with projections is greatly enhanced if the data are tabulated by sex and age. Their value also grows progressively when the relevant inquiries are repeated in successive censuses or sample surveys, providing material for trend analyses. Data from voting registers, social security records, school enrolments, and even food rationing records may also be useful for internal migration estimates.

65. In some cases it may be useful to make local and regional projections with and without taking the effects of migration into account. This may be the case,

12/ Ibid., Chapter VII.

for example, where it is necessary to assess the possibilities of meeting anticipated local manpower requirements by local manpower requirements by local recruitment and the needs for recruiting workers from other parts of the country.

(b) Data for aggregate projections

66. In some circumstances, it may be necessary or advisable for practical reasons to make aggregate projections of total population instead of carrying out projections separately for sex-age groups. As already mentioned, this is commonly the case of local population projections, and it may also sometimes be the case of national projections where data on the sex-age structure of the population at the starting date of the projection are not available or not reliable. Various methods of making aggregate projections are possible. ^{13/} In the case where little more than two previous population counts are available, the annual rate of population growth during the interval time between the two counts may be assumed to continue in the future. Where a longer historical series of population counts can be obtained, a curve can be fitted to these data and then extrapolated. Here again, it is necessary to emphasize that the results obtained by such methods should be used with great caution.

67. Where records or estimates of birth and death rates (and of migration, if it is an important factor) are available, a more sophisticated method of aggregate projections (sometimes referred to as the "crude-rate" method) may be used. Here, birth, death, and migration rates are projected without regard to sex and age. This has an advantage over the method of fitting curves to historical series of population totals, in that specific consideration can be given to the component factors of population change. Preferably the data should be in the form of historical series of rates for each of these components; at least their current levels should be known or estimated within tolerable margins of error.

B. Labour force

1. Utility

68. Labour force projections have great significance for both economic and social development. Labour's position as one of the factors of production makes the projected labour supply basic in any consideration of the demographic conditions of economic growth. Furthermore, if one of the major aims of economic development is to provide for the employment needs of the population, as it is in many developing countries, labour force projections serve as a means of measuring these needs.

69. Labour force projections take on primary importance for economic planning when they are matched against projections of labour demand. Although standards for projections of demand for labour are not considered here, as these are not

^{13/} Manuals on methods of estimating population; Manual I, Methods of estimating total population for current dates (United Nations publication, Sales No.: 52.XIII.5), Chapter V.

demographic projections, the importance of their use in connexion with labour force projections deserves emphasis. A comparison of the projected labour force by sex, age and level of education as well as by occupation and industry, with corresponding projections of labour demand may serve to anticipate future shortages and surpluses of various types of labour and help to evaluate the adequacy of educational and training programmes in the light of economic growth requirements. Quantitative estimates of such surpluses and shortages are of great assistance in adjusting plans and incorporating corrective measures.

2. Areas

70. Projections of the labour force for urban and rural areas, principal cities, etc., are useful for the purposes mentioned in Part II above, with reference to areal classifications of population projections in general. In addition, these areal classifications have special value in labour force projections for the light which they shed on the roles of internal migration and urbanization in shifting the structure of the labour force in a country undergoing industrialization. Moreover, by carrying out labour force projections for urban and rural areas separately, the reliability of the projections of the total labour force in a country undergoing urbanization can be enhanced. This procedure improves reliability because of the important characteristic differences between urban and rural communities in patterns of participation in economic activities. Incorporation of an urban-rural classification into labour force projections is therefore highly recommendable where the necessary data are available.

3. Classifications of characteristics

71. The characteristics of the labour force which are most pertinent to economic and social planning (in addition to occupation, industry, and status as employer, employee, etc.) are sex, age, and educational level. Classifications by occupation, industry, and status are not considered here, as the problem of introducing these classifications into labour force projections is primarily a non-demographic one. It should be noted, however, that demographic factors do have a bearing on these aspects of composition of the labour force, and particularly on the distribution between agricultural and non-agricultural sectors. A link should be established between population projections for urban and rural areas and projections of the agricultural and non-agricultural sectors of the labour force.

72. The following standard forms of classifications by sex, age, and level of education in labour force projections are suggested:

- (a) Sex: Male, female;
- (b) Age: Under 15 years, ^{14/} 15-19, 20-24, 25-34, 35-44, 45-54, 55-59, 60-64, 65 years and over;
- (c) Educational level: (see section D below).

^{14/} A different age-limit for this group may be preferable in countries where the legal minimum age for employment exceeds 15 years. Sub-division of the group may be advisable in some other cases.

73. Where educational level is cross-classified with sex and age, it may be necessary to use abridged classifications of age or educational level, or both characteristics.

74. In many countries, available data are not sufficient to provide a satisfactory basis for a classification by educational level in labour force projections. The classification by sex and age alone, without regard to educational level, is highly valuable, however, in connexion with economic and social planning. Its utility derives from the difference in aptitudes of workers belonging to various sex-age categories, as well as from traditional sex and age requirements for employment in different types of jobs. Projections of the labour force by sex and age can also be used to estimate future changes in rates of accession to, and retirement from, the labour force. These factors are important in connexion with the problems of labour turn-over and elasticity of the labour force structure.

4. Data required

75. In making labour force projections, a decision must be reached at the beginning with regard to the definition of labour force to be adopted. Consideration must be given, in reaching a decision on this question, to problems of comparability in historical series of statistics on economic activities of the population in the country concerned, including variations in quality of the data as well as in the definitions used, especially as they relate to the classification of such groups as unpaid family workers, part-time workers, pensioners, apprentices, unemployed persons and members of the armed forces. Sometimes, as a result of such considerations or for other reasons, it may be found advisable to make a distinction between projections of the potential labour force and of the actual labour force. In developing countries, there is often a wide gap between the two, and distinctions may be needed between labour potential, economically active population and persons in paid employment.

76. Like projections of total population, projections of the total labour force can be made most accurately by projecting each sex-age group separately. Indeed, as already mentioned, it is preferable, if possible, to make separate projections for each sex-age group in urban and rural segments of the labour force. Ordinarily, the labour force is projected in the aggregate only when the necessary data for separate projections of sex-age groups are lacking, or when projections are undertaken for a large number of local areas for which the extensive calculations involved in projections by sex and age would not be justified.

(a) Data for aggregate projections

77. For an aggregate projection of the labour force, it is necessary to have, as a minimum: (1) a corresponding projection of the total population; and (2) a general labour force participation rate (that is, a measure of the ratio of the labour force to the total population) at the starting date of the projection. This rate may then be assumed to remain constant in the future, or it may be modified to make allowance for the influence of anticipated changes in related factors such as the trend of school attendance. A historical series of statistics from population censuses or demographic sample surveys showing the past trend in

this rate is helpful, if available, as a basis for projecting the trend into the future; but this kind of a projection is not reliable unless the assumption of continuity of the trend in the future is supported by other considerations.

78. The quality of such a projection may be improved considerably in many circumstances by using more specific participation rates, as, for example, by relating the total labour force not to the total population but to the population of working age, and projecting this relationship. This method requires, of course, a projection of population by age groups. Separate calculations for males and females represent a further improvement which is usually feasible, as labour force statistics are generally available with at least a classification by sex. Classifications by race or other ethnic groupings may also be helpful in improving the projection under some conditions.

(b) Data for projections by sex and age

79. The procedure and data requirements of a labour force projection by sex and age groups are entirely analogous to those of an aggregate projection, except that each sex-age group is considered separately (preferably with a further distinction between urban and rural areas). In this case, of course, both the basic projection of the population and the labour force statistics for the base date must be classified by sex and age (and preferably urban-rural residence). The calculations are made by applying projected sex-age-specific rates of participation in the labour force (that is, the ratios of numbers in the labour force to the total number of persons for each sex-age group) to corresponding sex-age groups of the projected population.

80. In some cases, it may be satisfactory for such a projection to assume that the sex-age-specific participation rates (preferably calculated separately for the urban and rural population) will remain constant in the future. Assumptions with regard to expected changes in these rates may be introduced, however. Among the materials which may be used in selecting appropriate assumptions in this respect are historical series of data showing past trends in the rates and data representing the experience of other countries. ^{15/} If a projection of school attendance is carried out, the results should be considered in relation to the projection of future changes in labour force participation rates for the population of school age and rates of entry of school-leavers into the labour force. Consideration should also be given to the possible effects of expected developments in the fields of education, health, and social security provisions upon the trends of these rates for various sex-age groups. Classifications pertaining to ethnic groups, marital status (especially of females) and educational levels of the adult population may also be helpful in improving the quality of the labour force projection where the necessary data are available.

81. One of the major problems in labour force projections by age and sex is to forecast the trends of participation rates of women. Among the factors which should be taken into consideration in this connexion, the following deserve

^{15/} Materials useful for this purpose may be found in Demographic Aspects of Manpower, Report I: Sex and Age Patterns of Participation in Economic Activities, United Nations publication, Sales No.: 61.XIII.4.

special mention: future trends in age at marriage, fertility, child-care arrangements, rural-urban migration, demand for wage workers and occupational composition of this demand, and attitudes toward participation of married and unmarried women in the labour force.

(c) Data for projections by educational level

82. An elaboration of essentially the same method described in (b) above is employed in making projections of the labour force by educational level. The usual procedure is to project labour force participation rates separately for each category in a cross-classification of the population by sex, age, and educational level. Of course, a projection of population with the cross-classification of these characteristics is required; the data required for such a projection are outlined in section D below. The corresponding cross-classification of the labour force at the base date is also required. Many countries will not have current data on the educational differentials of sex-age-specific activity rates. In this case, a projection can be made under the assumption of no educational differential with respect to economic activity, and this projected labour force will at least take account of any difference between the level of education of the projected population and that of the base population.

C. School-age population and school attendance

1. Utility

83. Projections of school attendance at elementary, intermediate, and higher levels are obviously needed in planning school construction and teacher training programmes so as to provide enough classroom space and enough teachers when and where they will be needed. Furthermore, projections of school population, school attendance and educational levels of the population are useful in appraising the organization and operation of the educational system. Such an appraisal may show a need for changes in the system, possibly including the adoption of new ways of teaching, different from those of the traditional schools.

84. School attendance projections are not independent of policy with regard to the share of public resources that should be invested in education. If a detailed budget of educational investments over a period of years has been established, it is possible to estimate how many students can be accommodated up to each level of elementary, intermediate, and higher education. Then, with the help of additional data as outlined in section D below, the future numbers of adults at different educational levels can be estimated. But the procedure of estimation may also be turned about, beginning with a goal for the distribution by educational level of the adult population to be achieved during the period of a national plan. On this basis, the required levels of school attendance and the corresponding budget of educational investments can be determined. Viewed from these two angles, projections of school attendance in relation to the school-age population appear as the embodiment of national policy on one of the most fundamental issues of developmental planning: the degree of emphasis to be placed on education as a lever for economic, social, and cultural advancement of the nation.

2. Time-span

85. When projections of school-age population and school attendance are extended more than a few years into the future, their reliability comes to depend not only on future mortality and migration patterns, but also on the accuracy of prediction of future numbers of births. This weakness is most serious for countries where fertility is not stable. It pertains especially to projections of the numbers of elementary school children, which can be carried forward only half a dozen years, before the future numbers of births become a factor.

86. On the other hand, a rather long-range view is desirable in some aspects of educational planning. It is true that construction of school buildings requires only a few years and that short-term projections should be adequate to show how large a construction programme must be undertaken each year in each area to meet imminent needs. But training of an adequate force of qualified teachers may require foresight over a longer range, especially in countries where graduates of intermediate schools and higher-education institutions are in short supply and many competing demands are made for their services. Moreover, as far as school buildings are concerned, it is desirable to try to predict the need in each area over a rather long period if wasteful construction is to be avoided. A long-range outlook is also imperative when an attempt is made to gear current investments in educational facilities to future goals for raising the educational level of the adult population.

87. In practice, the educational planner generally calls for projections over a span of perhaps twenty or thirty years, despite misgivings as to their reliability, and provides for current investments in school-construction in various localities with an eye on long-range expectations as well as more immediate requirements. The projections need to be checked periodically with the changes of the birth rate and other demographic factors and revised as need be, the construction and teacher-training programmes being adjusted accordingly.

3. Areas

88. Provision of school services in rural areas is often more difficult and more expensive than in urban areas because of the dispersion of the rural population and sometimes also because inhabitants of the rural areas do not place the same value on the advantages of education. Furthermore, the educational needs of the rural population may not be the same as those of the urban population. These considerations, together with the rapid growth of cities in many countries, lend special importance to the urban-rural classification in projections of school-age population and school attendance. Here, as in labour force projections, the urban-rural classification is also helpful in improving the quality of national total projections.

89. There is a special need for local projections in connexion with the planning of school construction. As the basic unit for educational programming is the school district, school population and attendance projections should ideally be made for each school district. In practice, however, it may be difficult to make such projections for all of a country's school districts. It may therefore be

necessary to base local school plans, as well as other types of local plans, on general-purpose projections of total local population.

4. Classifications of characteristics

90. The population of school age may be defined within different age limits for different countries. The appropriate age limits will depend not only on customs and legislation relating to school attendance but also on the major purpose which the projections are to serve. For example, it may be appropriate for some purposes to limit the projections to the normal age range of attendance at elementary school, while for other purposes, a wider age range may be more suitable, including ages of attendance at secondary schools or higher level institutions. The following standards are suggested for classifications of projections of this age:

Sex: Male, female.

Age groups: Appropriate age classifications, varying from country to country, depending on normal relationships between age and level of school attendance, and on the degree of detail in planning for provision of school facilities. Single years of age through the normal age-ranges of attendance at elementary and intermediate schools are commonly desired.

School attendance: Attending school, not attending school.

Level of school attendance (for population attending school): Appropriate classifications by level varying from country to country. At least the categories of elementary, intermediate, and higher educational institutions are commonly required.

91. The classification by sex may not be required for planning the provision of school facilities, except where male and female rates of attendance follow different trends, or separate facilities are provided for the two sexes. The sex classification is important, however, in the use of school-attendance projections as a basis for projecting the distribution of adult population by educational level. It may also be important in connexion with policy regarding efforts to promote school attendance of persons of each sex up to certain levels.

92. Where detailed age classifications are included in the projections, their main purpose is generally to provide a basis for estimating the future distribution of school attendance by level. The age classification may then be abridged or eliminated altogether in the publication of results of the projection. It is useful, however, to retain at least a classification by five-year age groups if the school attendance projections are to be used in projecting the educational level of the adult population as indicated in section D, below.

5. Data required

(a) Data for projections of school-age population

93. Projections of school-age population are obtained as by-products of projections of population by sex and age. Various methods of interpolation, such as the use of Sprague multipliers, are available for deriving estimates by single years of age or other groupings from population projections by five-year groups. Where accurate current statistics of births are available, the reliability of short-range projections of school-age population can be improved by taking into account annual variations in the recorded numbers of births. In some circumstances, the reliability of these projections over a somewhat longer range can be enhanced by projecting births year by year over a short future time-span.

(b) Data for projections of school attendance by sex and age

94. Projections of the numbers of persons attending and not attending school in each sex-age group are obtained by applying sex-age-specific school attendance rates to the projections of corresponding groups of the school-age population. The first requirement for the projection of school attendance rates is a set of these rates at or near the base date. These base figures are usually derived from tabulations of results of census or demographic sample survey inquiries about school attendance. Where census or survey data on this subject are not available, it may be possible to estimate the attendance rates at the base date by relating school enrolment, statistics to population figures for the appropriate sex-age groups. However, this relationship may be problematical even if the enrolment statistics are cross-classified by age, sex and level of school enrolment because the ages recorded in school enrolments may not be comparable with those recorded in the census.

95. In projecting future trends of school attendance rates, the main factors to be considered are the extent of planned investments in public school facilities in future years, the policy with regard to implementation and enforcement of compulsory school attendance laws, and the trend of effective demand for schooling. The trend of effective demand is especially pertinent to attendance beyond the legal minimum with regard to age or level of school achievement. Historical series of statistics showing trends of sex-age-specific attendance rates or enrolment in schools at various levels are helpful for taking this factor into account in projections. The experience of other countries may also be considered.

(c) Data for projections of school attendance by level

96. For converting projections of school attendance by sex and age into projections of attendance at various school levels, it is necessary to have information on the relationship between age and level of school attendance. One factor in this relationship is the age at first enrolment and another, usually more important, is the frequency of non-promotion from each school grade to the next. A third factor is the variation by age of drop-out rates for each school level. The relationship between age and attendance level as of the base date may be established and the factors influencing it may be analysed, by means of

census, sample-survey or school enrolment statistics by age and scholastic level of persons in school. Future changes in the relationship may be anticipated by studying historical data, if available in appropriate form, and taking into account the potential effects of steps which may be taken in the future to improve efficiency of operation of the school system in this respect.

D. Population by educational level

1. Utility

97. One of the main purposes of population projections by educational level has already been mentioned; that is, to furnish a basis for a classification by educational level in projections of the labour force. This is important in evaluating the aptitudes and productive capacity of the future labour force, planning for full and effective utilization of this capacity, and planning programmes of educational development to meet future demands for educated and trained workers. But the role of popular education in economic, social and cultural advancement of a nation is not limited to the production of qualified labour supply. The educational level of the population generally, and not merely of the labour force, is also important as it affects the whole complex of popular attitudes, motives, and patterns of behaviour. Education changes the outlook of the people, opening up new horizons and fostering the desire and the will to achieve a better life. A question of particular importance to Governments concerned with population policy issues is the possible effect of a rising level of education on trends of mortality, fertility and migration.

2. Areas

98. There is less need for local area projections of population by educational level than for local projections of school-age population, school attendance or labour force. The urban-rural classification, however, is of prime importance in projections of population by educational level, as in all the other major types of population projections. In most countries, the levels of education of the urban and rural population differ markedly, and the social and economic needs for higher-level education are not the same in rural and urban communities. In educational level projections, as in other types, the quality of the national total results can usually be enhanced by considering the urban and rural segments separately.

3. Classifications of characteristics

99. Projections of educational level of the population are commonly limited to persons above the normal school-leaving age. The following standards for classifications are suggested:

- (a) Sex: Male, female;
- (b) Age: 15-19, ^{16/} 20-24, 25-29, 30-34, 35-39, 40-44, 45-54, 55-64, 65 years and over;
- (c) Educational level: Classifications appropriate to the conditions and needs of the country.

100. The most useful classification pertaining to educational level, where the relevant data are available, refers to the highest level of instruction completed by the individual in the country's regular educational system or its equivalent. This classification should show at least the number of persons who will have attended one or more years of elementary, secondary, and higher educational courses; and among those having attended institutions at each level, how many will have graduated. A classification showing single number of years or grades attended or completed is useful if at all possible.

101. Literacy is an alternative classification, useful where data are not available for introducing into the projection a classification by highest level of instruction.

4. Data required

102. The fundamental projection of population by sex and age provides the essential basis for the projection by level of education, just as it does for the projection of the labour force. The calculations are made by applying projected sex-age-specific per cent distributions by educational level (or literacy rates) to the projected numbers of males and females in each age group of the population for future dates. Among the necessary materials are data on these distributions (or rates) at the base date of the projection, obtained from a population census or demographic sample survey.

103. The future sex-age-specific distribution by educational level (or literacy rates) are projected on a "cohort" basis; that is, the distribution (or rate) for each group beyond school age at the base date is taken as the basis for estimating the distribution for the corresponding group, at successively higher age levels, at future dates. Each cohort's distribution by educational level is usually assumed to remain constant throughout the cohort's life beyond the age at which any significant numbers continue in school. Such an assumption is satisfactory where adult educational programmes are not of great numerical importance, and where differences in mortality and migration rates according to educational level are not too wide.

104. For the cohorts of young men and women entering in the future into the age range to which the projection refers, it is necessary to estimate the initial distribution by educational level (or literacy rate). Similarly, for cohorts which have already entered the age range of the projection, but still have

^{16/} In countries where the normal school-leaving age is relatively high, it may be preferable to omit this category and begin the classification with the age-group 20-24.

significant numbers continuing in school, the extent of future up-grading of their distribution by educational level (or increase in their literacy rate) must be estimated. The basis for these estimates is the projection of school attendance, by level of attendance, for the appropriate sex-age groups of the school-age population (section C above).

105. For cohorts still found, at the starting date of the projection, in the range of ages at which significant numbers attend school, it is necessary to estimate how much their distribution by educational level will be up-graded (or their literacy rate increased) when they reach the limit of school attending ages. Likewise for subsequent cohorts entering in the future into the age-range to which the projection refers, the distributions by educational level (or literacy rates) must be estimated as of the time when they will reach the end of their schooling. The best basis for such estimates is the base-period data and future projections of school attendance by scholastic level for the appropriate sex-age groups of the school-age population (section C (c) above). However, where such data and projections are not available and cannot be supplied for any reason, it may still be possible to make projections of adult population by educational level (or literacy) with some sacrifice of reliability, by using appropriate assumptions as to future trends in educational attainments (or literacy rates) of successive cohorts reaching the end of the school-attending age range. While the quality of results in this case is likely to be less satisfactory, it may be adequate to serve many useful purposes.

E. Households and families

1. Utility

106. Projections of numbers of households and families are useful in economic and social planning in view of the many types of goods and services for which household or families are the units of consumption. Housing is one of the most important items in this category. The cost of providing satisfactory housing for a growing population is so great that the projection of housing needs is ordinarily an important element in development programmes.

107. The measurement and analysis of housing requirements involve statistical concepts used in both population and housing enumerations. Households may be classified as private households or institutional households, ^{17/} and for most housing studies the private household is the basic unit. ^{18/} Of the various categories of housing units, private and collective, ^{19/} the dwelling is ordinarily the fundamental unit in measuring housing needs. The relationship may be expressed

^{17/} These concepts are defined in paragraph 407 of Principles and Recommendations for National Population Censuses, United Nations publication, Sales No.: 58.XVII.5.

^{18/} Further subdivisions include one-person and multi-person households and classification by structural type; see ibid.

^{19/} These concepts are defined in paragraphs 301-313 in General Principles for a Housing Census, United Nations publication, Sales No.: 58.XVII.8.

as follows: a dwelling is a housing unit intended for habitation by a private household. Families are defined in various ways in the censuses of different countries; as a rule, the definitions refer to groups of persons within a household who are related in one way or another by blood or marriage. Biological families (sometimes called "nuclear" families) may be defined as consisting of parents and their unmarried children living in the same household.

108. Requirements to bring the housing inventory at some point in the future into conformity with nationally adopted standards include evaluation of current shortages as shown by over-crowding, doubling-up of households and the use of substandard and inadequate units. Future needs include the replacement of units lost from the inventory, a reserve of vacant units and an estimate of the number of dwellings required to house population gains.

109. Projections of the number of households can serve as the basis for determining the increase in dwellings needed to house the population adequately. Since the types of housing required vary with the size and composition of the households, classifications by number of household members and characteristics such as age, sex and marital status of the household head are useful in refining the projections. In assessing housing needs, it is important to take account not only of the size of households but also their composition (structural type). Projections of families (particularly biological families) as well as households are valuable in calculating housing needs, and also needs for other goods and services. Family projections also have special uses in the planning of social security provisions.

2. Areas

110. The value of projections of households and families is greatly enhanced by an urban-rural classification. Problems posed by rapid urbanization, including the need for additional housing and other facilities, require urban-rural data if plans for their solution are to be formulated. This classification is also useful in making estimates of future needs for other goods and services, the consumption of which differs as between urban and rural households.

111. Projections for local areas, especially larger cities and other areas of rapid growth, are needed where housing and other costly permanent facilities are included in planning and investment programmes. These should be expressed in terms of households, even though it may be necessary to base the projections on total population figures to which an estimated average persons per household has been applied.

3. Classifications of characteristics

112. In addition to projections of the total numbers of households and families, the following classifications are useful for planning housing programmes and estimating needs for various other types of goods and services, so far as it is possible to introduce these classifications into the projections:

- (a) Size of household or family: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 or more persons;

(b) Sex, age, and marital status of household or family head:

Sex: Male, female;

Age: Under 15 years, 15-19, 20-24, 25-34, 35-44, 45-54, 55-64,
65 years and over;

Marital status: Single, married, widowed or divorced.^{20/}

113. Although the cross-classification of size of household or family with sex, age, and marital status of the head is a valuable basis for household and family projections, it is not likely to be practicable in projections for most countries.

114. Household projections are generally limited to numbers of private households, as illustrated in the discussion of housing needs, since the number of collective or institutional households are determined in many instances by administrative policies and other factors rather than by population change, and the data serve different analytical purposes.

4. Data required for principal methods of projection

(a) Data for aggregate projections

115. A crude aggregate projection of the number of households (or families) can be made simply from a projection of the total population and projection of the ratio between number of households (or families) and population. This ratio, calculated as of the base date from census statistics, may be assumed to remain constant in the future; or if its past trend can be deduced from available historical statistics, the trend may be assumed to continue in the future.

116. If all the data required for application of the more refined methods described below are not available, it may still be possible to improve the aggregate projection considerably by relating the number of households (or families) to the adult population instead of the total population. When fertility and mortality rates are changing, or the structure of the population is being strongly affected by migration, the ratio of the number of households (or families) to the population over age 15 (or 20) is likely to be more stable than the ratio to total population. A further improvement may be achieved in some circumstances by using the ratio of households (or families) to an appropriately selected group of the adult population, such as males in the age-range 15-64, for example.

(b) Data for projections by sex and age of head

117. A more refined method of projecting the number of households (or families) can be applied if a projection of population by sex and age groups is available, together with statistics for the base date showing heads of households (or families)

^{20/} In countries where consensual unions are frequent, the category "consensually married" must also be considered.

as well as the total population, classified by sex and age groups. The method applicable in this case is entirely analogous to that of a labour force projection by sex and age. Sex-age-specific "headship rates" are computed for the base date (i.e., percentages of household or family heads among population of each sex-age group). These rates, held constant for the future or assumed to change in continuation of trends shown by historical statistics, are applied to the projected population figures by sex and age; the resulting numbers are summed up to obtain the projected total numbers of households (or families). The distribution of the household (or family) projections by sex and age of head is a valuable by-product.

(c) Data for projections by sex, age and marital status of head

118. A still more refined method of projection becomes possible if a cross-classification by marital status as well as sex and age is introduced both into the population projections and into the base data on characteristics of household (or family) heads. The "headship rates" are then calculated and applied separately for single, married, and widowed or divorced men and women in each age group. This method has the advantage of taking into account the effects of anticipated changes in the marriage rate, average age at marriage, and incidence of widowhood and divorce as factors influencing household (or family) formation and dissolution. However, it requires detailed historical series of vital statistics, or data from a series of censuses, showing past changes in composition of the population with regard to marital status, sex, and age, in order to determine long-range trends of these factors and project them into the future.

(d) Data for projections by size of household or family

119. A distribution by size of household (or families) can be introduced into the projections by determining from the data of a series of past censuses, long-range trends in the per cent distribution of households (or families) by size, and projecting these trends into the future. Fertility projections should be taken into account here, since fertility is the main factor influencing the size of households and families. The results should be checked with the projections of total population and adjusted as necessary for consistency. Such a check is made by multiplying the projected number of households (or families) of each size by the corresponding number of persons, summing the products, and adding a suitable figure for the population not in private households and, in the case of family projections, persons other than family members in private households.

IV. BIBLIOGRAPHY

This bibliography is not intended to be an exhaustive list of publications dealing with population projections. In selecting the titles, the following criteria have been applied flexibly:

Availability: All but a few of the works included have been published since 1950. Studies which were intended for limited or internal distribution are not included. An effort was made to attain wide geographical coverage, as many of the publications are more easily found in the country or region of their publication than elsewhere.

The nature of the study: Special consideration was given to the inclusion of those studies in which methodological, analytical or policy-making considerations were important. The selection of a particular projection for a country or a region in preference to others available does not imply that the projection selected is necessarily considered to be superior. Some of the projections included may have been superseded by new projections published more recently.

Geographical and language coverage: An attempt was made to include studies published in different languages and dealing with each subject considered in respect of as many countries and regions as possible, but avoiding repetition for each country.

A. General

- Barclay, G.W. Growth of Population. In Techniques of Population Analysis. New York, John Wiley and Sons, London, Chapman and Hall, 1958, pp. 203-240.
- Biji, M. Methods for long-term estimation of the sex and age structure of the population. Paper presented to the United Nations Conference on the Application of Science and Technology for the Benefit of the Less Developed Areas (E/CONF.39/B.47). New York, 1963.
- Blaupain, H. Analyse par génération; exemples d'application à la projection démographique. Informations Statistiques (Brussels), No. 4, Office Statistique des Communautés Européennes, 1962.
- Bocaz, A. Curva de Gompertz aplicada al crecimiento de la población chilena. Estadística Chilena No. 7, Julio 1953.
- Cox, P.R. Population projections: notes on the choice of basis. Journal of the Institute of Actuaries Students' Society. Part 2, Vol. 11, No. 2, 1952.
- Cox, P.R. Estimating the Future Population. Applied Statistics (London), Vol. 1, No. 2, June 1952, pp. 82-94.
- Cox, P.R. Population Projections and A Survey of Some Projections of the British Population. Demography and Addendum to Demography. Cambridge, Cambridge University Press, 1957, pp. 232-277.
- De Meo, G. De quelques critères pour les prévisions du développement futur des des populations. Rome, Svimez, 1954.
- Dorn, H.F. Pitfalls in population forecasts and projections, Journal of the American Statistical Association, Vol. 45, pp. 311-334, September 1950. Reprinted in Demographic Analysis, Selected Readings, edited by J.J. Spengler and O.D. Duncan. The Free Press, Glencoe, Illinois, 1956.
- Durand, J.D. Generalized demographic models and projections of the population of China. Asian Survey, Vol. 1, No. 4, June 1961.
- Estrangin, L. L'évolution probable de la population agricole d'ici dix ans. Comptes-Rendus Académie d'Agriculture de France, Vol. 43, No. 14, 1957.
- Grauman, J.V. Population Estimates and Projections. In The Study of Population: An Inventory and Appraisal. P.H. Hauser and O.D. Duncan, ed. The University of Chicago Press, 1959.
- Hajnal, J. The prospects for population forecasts. Journal of the American Statistical Association (Washington, D.C.), Vol. 50, No. 270, pp. 309-322, June 1955.
- Hajnal, J. Perspectivas das previsoes de população. Revista Brasileira de Estadística (Rio de Janeiro), Vol. 17, No. 67, July-September 1956.

- Hamilton, C.H. and Perry, J. A short method for projecting population by age from one decennial census to another. Social Forces (Chapel Hill, North Carolina), Vol. 41, No. 2, December 1962.
- Henry, L. and Pressat, R. Perspectives de population dans les pays sous-développés. Le "Tiers-Monde". Sous-développement et développement. Institut National d'Etudes Démographiques, Cahier No. 39 (Réédition du Cahier No. 27), pp. 189-213. Paris, Presses Universitaires de France, 1961.
- Hocking, W.S. A method of forecasting the future composition of the population of Great Britain by marital status. Population Studies (London), Vol. 12, No. 2, November 1958.
- Jaffe, A.J. Population estimates. In Handbook of Statistical Methods for Demographers (Preliminary edition). United States Department of Commerce, Bureau of the Census, Washington, D.C., U.S. Government Printing Office, 1951.
- Leca, M. Perspectives démographiques et évolution des effectifs d'enfants ouvrant droit aux prestations familiales. Revue française du Travail (Paris), Vol. 13, No. 1, January-March 1959.
- Leroy, L. Exode; ou, Mise en valeur des campagnes. Collection "La Terre", Encyclopédie Paysanne. Paris, Flammarion, 1958. 300 pp.
- Mazumdar, M. Implications of future stationary size in India's Population. Indian Population Bulletin (New Delhi), Vol. 1, No. 1, April 1960.
- Pearl, R. and Reed, L.J. On the rate of growth of the population of the United States since 1790 and its mathematical representation. Proceedings of the National Academy of Sciences, Vol. 6, pp. 275-288, 1920.
- Pressat, R. Perspectives de population. In L'Analyse Démographique, Paris, Presses Universitaires de France, 1961 (pp. 319-392).
- Reed, L.J. Population growth and forecasts. Annals of the American Academy of Political and Social Science (Philadelphia), Vol. 188, pp. 159-166, 1936.
- Rivlin, A.M. A new model for population projection. Paper presented at the meeting of the Econometric Society, Atlantic City, September 1957. Washington, D.C., The Brookings Institution.
- Shanthamma, N.S. Population projections for some language groups in India. Asian Economic Review (Hyderabad), Vol. 2, No. 3, May 1960.
- Shryock, H.S. (Jr.) Forecasts of population in the United States. Population Studies (London), Vol. 3, No. 4, March 1950.
- Shryock, H.S. (Jr.) Accuracy of population projections for the United States. Estadística (Washington, D.C.), Vol. 13, December 1954.

Sibley, E. Problems in population estimation. The American Journal of Public Health (New York), Vol. 34, No. 2, February 1944.

Spiegelman, M. Population Estimates and Projections. In Introduction to Demography. Chicago, The Society of Actuaries, 1955.

Tobata, S. Japan's farming population. Asian Review (London), Vol. 56, No. 205, January 1960.

United Nations. Department of Social Affairs. Manuals on Methods of Estimating Population, Manual I, Methods of Estimating Total Population for Current Dates (ST/SOA/Series A/10). Sales No.: 52.XIII.5.

United Nations. Department of Economic and Social Affairs. Manuals on Methods of Estimating Population, Manual II: Methods of Appraisal of Quality of Basic Data for Population Estimates (ST/SOA/Series A/23). Sales No.: 56.XIII.2.

United Nations. Department of Economic and Social Affairs. The Future Growth of World Population (ST/SOA/Series A/28). Sales No.: 58.XIII.2.

United Nations. Economic Commission for Asia and the Far East. The demographic situation and prospective population trends in Asia and the Far East. Document (APC/WP/1) presented to the Asian Population Conference, New Delhi, India, 10-20 December 1963.

United Nations. Department of Economic and Social Affairs, World Population Conference, 1954. Twenty-two papers presented to Meeting 13 (Methods of making population projections) and Meeting 14 (Prospects for future population changes) published in Proceedings of the World Population Conference, 1954, Vol. III, New York, 1955. Sales No.: 55.XIII.8 (Vol.III).

B. Planning for economic and social development and population projections

Agarwala, S.N. (Editor). India's population: some problems in perspective and planning. Papers presented at a seminar of the Institute of Economic Growth, Delhi, in 1959. Bombay and London. Asia Publishing House, 1961.

Bénard, J. with the collaboration of H. Brousse, A. Fage and J. Bourgeois-Pichat. Vues Sur l'Economie et la Population de la France Jusqu'en 1970. Institut National d'Etudes Démographiques. Travaux et Documents. Cahier No. 17. Presses Universitaires de France, 1953.

Bourgeois-Pichat, J. Population projections, economic and social development: hopes and realities. Paper included in Food: one tool in international economic development. Edited by E.O. Haroldsen. (Papers presented at a conference conducted by the Center for Agriculture and Economic Adjustment of the Iowa State University in February 1962.) Ames, Iowa State University Press, 1962.

Brech, R. Britain 1984: Unilever's forecast. An experiment in the Economic History of the Future. London, Darton, Longman and Todd, 1963.

- Choudry, N.K. A note on the dilemma of planning population in India. Economic Development and Cultural Change, Vol. 4, No. 1, November 1955.
- Coale, A.J. and Hoover, E.M. Population Growth and Economic Development in Low-Income Countries. Princeton University Press, 1958.
- Ducoff, L.J. The future population and labour force of Mexico, Central America and Panama: some implications for economic development. Estadistica (Washington), Vol. 17, No. 63, June 1959.
- George, P. Rôle et importance des prévisions de population pour l'élaboration des programmes d'action régionale. International Population Conference, New York, 1961. Tome II, pp. 448-453. London, Union Internationale pour l'étude scientifique de la population, 1963.
- Great Britain. Ministry of Pensions and National Insurance. National Insurance Acts, 1946-1959. Report by the Government Actuary on the Second Quinquennial Review, London, H.M. Stationery Office, 1960.
- Hetman, F. Croissance démographique et économique: examen des prévisions à long terme. Bulletin SEDEIS (Paris), No. 859, Supplement I, July 1963.
- India. National Council of Applied Economic Research. Long-term projections of demand for and supply of selected agricultural commodities; 1960-61 to 1975-76, New Delhi, 1962.
- Jamaica. Ministry of Development and Welfare, Jamaica: five-year independence plan, 1963-1968. A long-term development programme, Kingston, Government Printer, 1963.
- Royal Statistical Society. Food supplies and population growth. Papers presented at a one-day conference of the Royal Statistical Society, Journal of the Royal Statistical Society (London), Series A, Vol. 125, No. 3, 1962.
- Korea, Republic of. Economic Planning Board, Summary of first five-year economic plan, 1962-1966, Seoul, 1962
- Kundu, A. The economy of British Guiana: 1960-1975. Social and Economic Studies (Jamaica), Vol. 12, No. 3, pp. 307-380, September 1963.
- Leibenstein, H. Economic Backwardness and Economic Growth, New York, John Wiley and Sons, Inc., 1963.
- Lukaczer, M. Economic assumptions underlying the medium-range projections of the Federal Old Age and Survivors Insurance and Disability Insurance Trust Fund, 1966-1975, Washington, Social Security Administration, Division of Program Research, August 1961.
- Muhsam, H.V. The utilization of alternative population forecasts in planning, Bulletin of the Research Council of Israel, Vol. 5, Nos. 2-3, March-June 1956.
- Myers, R.H. Economic growth and population change in Taiwan. Malayan Economic Review (Singapore), Vol. 8, No. 2, October 1963.

Myers, R.J. and E.A. Rasor. Proyecciones a largo plazo de la población de los Estados Unidos para fines de estimar el costo del Seguro Social. Estadística (Washington) Vol. 12, No. 43, Junio 1954.

Olivier, R. Population projections for planning purposes, United Nations document E/CN.9/CONF.3/L.5.

Paes Morais, J.J. and A. Costa Leal. A evolução demográfica nacional e o desenvolvimento económico. Revista de Economia (Lisbon), Vol. 11, No. 4, December 1958.

Sauvy, A. De la prévision démographique a la prévision économique. Population (Paris), Vol. 14, No. 1, Jan.-March 1959.

Singapore, Ministry of Finance. Development Plan, 1961-1964. Singapore, Government Printer, 1961.

Tabah, L. El problema Población - Nivel de Vida - Inversiones en Chile, Ensayo sobre desarrollo para los próximos 15 años. Santiago de Chile, Centro Latinoamericano de Demografía, 1958.

United Nations. Department of Economic and Social Affairs. The Aging of Populations and its Economic and Social Implications. ST/SOA/Series A/26, Sales No.: 56.XIII.6.

United Nations. Economic Commission for Asia and the Far East. Population trends and related problems of economic development in the ECAFE region. Economic Bulletin for Asia and the Far East, Vol. 10, No. 1, June 1959.

United Nations. Bureau of Social Affairs. Implications of population trends for planning urban development and housing programmes in ECAFE countries. Document (A.P.C./W.P/4) presented to the Asian Population Conference. New Delhi, India, 10-20 December 1963.

Vincent, L.A. La prévision économique à long terme. Essai sur la méthode. Etudes et Conjoncture (Paris), Vol. 15, No. 9, Sept. 1960.

Zachariah, K.C. Population projections needed for planning and policy-making. United Nations document (E/CN.9/CONF.2/L.15).

C. Projections of components of population change

Balk, W. et al. Extrapolation of mortality in view of a population forecast to be made. Het VerzekeringsArchief / Actuarial Studies / No. 3, 1961.

Barnes, H.A.R. Experiments in mortality graduation and projection using a modification of Thiele's formula. Journal of the Institute of Actuaries, Vol. 84, (II, 367), 1958.

Campbell, A.A. A method of projecting mortality rates based on post-war international experience. U.S. Department of Commerce, Bureau of the Census. International Population Reports, Series P-91, No. 5, Washington, D.C., U.S. Government Printing Office, 1958.

Colombo, B. Intorno all'estrapolazione della dinamica della nuzialità /On the subject of extrapolating from the dynamics of nupciality/. Statistica (Bologna), Vol. 14, No. 4, October-December 1954.

Davidson, M. Predictions in Fertility. Eugenics Quarterly, Vol. 8, No. 2, June 1961.

Heide, H. ter. Migration models and their significance for population forecasts. Milbank Memorial Fund Quarterly, Vol. 41, No. 1, January 1963.

Mayer, K. Fertility Changes and population forecasts in the United States. Social Research (New York), Vol. 26, No. 3, Autumn 1959.

Sanyal, S.N. Oral Contraception in Relation to Population Projection and Future Planning in India. Man in India (Ranchi), Vol. 37, July-September 1957.

Schachter, J. et al. Short-range birth projections, Public Health Reports, Vol. 73, No. 11, Nov. 1958.

Tarver, J.D. Projections of mortality in the United States to 1970. Milbank Memorial Fund Quarterly, Vol. 37, No. 2, April 1959.

Vaidyanathan, K.E. and K.S. Gnanasekaran. An empirical analysis of the factors contributing to a lower growth rate of population in Madras State during 1951-1961. Indian Economic Journal (Bombay), Vol. 9, No. 1, July 1961.

Whelpton, P.K. Cohort Analysis and Fertility Projections, In Emerging Techniques in Population Research. Proceedings of a round table at the thirty-ninth annual conference of the Milbank Memorial Fund, 18-19 September 1962, at the Carnegie Endowment International Center. New York, Milbank Memorial Fund, 1963.

D. Total population by age and sex for countries and regions

Abbott, G.C. Estimates of the growth of the population of the West Indies to 1975. Social and Economic Studies (Jamaica), Vol. 12, No. 3, pp. 283-306, September 1963.

Adams, E. New population estimates for the Philippines, 1948-1962, The Philippine Statistician (Manila), Vol. 7, No. 3, September 1958.

Aird, J.S. The size, composition and growth of the population of Mainland China, U.S. Bureau of the Census, International Population Statistics Reports, Series P-90, No. 15, Washington, U.S. Government Printing Office, 1961.

Araica, H. Proyección de la población de la República de Panamá, Años 1950-1980. Santiago de Chile, Centro Latinoamericano de Demografía, 1960.

Badenhorst, L.T. The future growth of the population of South Africa and its probable age distribution. Population Studies (London), Vol. 4, No. 1, June 1950, pp. 3-46.

- Barrios, B.E. and H. Ruiz. Breve analisis de la situación demográfica de Guatemala en 1950 y proyecciones de la población entre 1950 y 1980. Santiago de Chile, Centro Latinoamericano de Demografía, 1960.
- Benitez Centeno, R. Análisis demográfico de México. Cuadernos de Sociología. Biblioteca de Ensayos Sociológicos. Instituto de Investigaciones Sociales. México, D.F., Universidad Nacional, 1961.
- Bogue, D.J. (Editor) Applications of Demography: The population situation in the United States in 1975. Scripps Foundation Studies in Population Distribution, No. 13. Oxford, Ohio, Shoestring Press, 1957.
- Borrie, W.D. and R. Rodgers. Australian population projections, 1960-1975. A study of changing population structure. Canberra, Australian National University, Department of Demography, Institute of Advanced Studies.
- Breznik, D. Zapazanja i prognoze nekih kategorija budućeg stanovništva FNRJ sa osvrtom na natalitet i mortalitet. [Observations and forecasts of some categories of the future population of FPR of Yugoslavia with a retrospective view of natality and mortality]. Statisticka Revija (Belgrade), Vol. 6, No. 3. September 1956 (French Summary).
- Brookfield, H.C. Mauritius: demographic upsurge and prospect. Population Studies (London), Vol. 11, No. 2, November 1957.
- Calvert, G.N. The future population of New Zealand: A statistical analysis. Wellington, New Zealand Government, 1945. 162 pp.
- Cataldi, A.O. La situación demográfica del Uruguay en 1957 y proyecciones a 1982. Santiago de Chile, Centro Latinoamericano de Demografía, 1964.
- Cox, P.R. Demographic developments in Great Britain since the Royal Commission on Population. Eugenics Review, Vol. 47, No. 1, April 1955.
- Das Gupta, A. and M. Majumdar. India, 1951-2001 Population Projections. Indian Statistical Institute Working Paper No. 9, Calcutta (1954). Also a working paper of the United Nations Seminar on Population in Asia and the Far East. (Bandung), December 1955.
- Das Gupta, A., S. Chotechanapibal, T. Chalothorn and W. Siripak. Population Perspective of Thailand. (Under publication in Sankhya, Calcutta).
- Fabry, M. and J. Mayer. La population future du Congo: perspectives démographiques. Centre d'Etude des Problèmes Sociaux et Professionnels de la Technique. Brussels, 1959.
- Febvay, M. and J. Hayoun. Perspectives de la population française jusqu'en 1980. Population totale et population active. Etudes Statistiques: Supplément Trimestriel du Bulletin Mensuel de Statistique, No. 2, April-June 1960. Paris, Institut National de Statistique et d'Etudes Economiques.
- Ford, J.R. and C.M. Stewart. An estimate of the future population of England and Wales. Eugenics Review. Vol. 52, No. 3, October 1960.

- France - Institut National de Statistique et d'Etudes Economiques. Service de Coopération. Perspectives de population dans les pays africains et malgache d'expression française. Etude de synthèse des enquêtes démographiques récentes. Paris, I.N.S.E.E., December 1963.
- Francis, O.C. The people of modern Jamaica. Kingston, Jamaica. Department of Statistics, 1963.
- Gil, B. Projections of the population of Israel (1955-1970). Israel, Central Bureau of Statistics. Special Series, No. 69. Jerusalem, Government Printer, 1958.
- Grot, J. Prévisions conditionnelles pour la population française jusqu'en 2005. Institut National de Statistique et d'Etudes Economiques. Etudes Démographiques, No. 6.
- Gutierrez, H. and J. Morales. Proyección de la población de Chile por sexos y grupos de edad, 1952-1982, Santiago de Chile, Centro Latinoamericano de Demografía, 1961.
- Henry, L. and R. Pressat. Evolution de la population de la France jusqu'en 1970. Population (Paris), Vol. 10, No. 1, 1955.
- Japan. Institute of Population Problems, Future population estimates for Japan by sex and age: Research Series, No. 138, Tokyo, August 1960.
- Korea Republic. Bureau of Statistics, Census Council. Population projections for the Republic of Korea, 1955-1975. Section E, Basic documents pertaining to Korean statistical activities (Revised Edition of 1960). Seoul, 1960.
- Lorimer, F. The population of the Soviet Union: History and Prospects, Geneva, League of Nations, 1946.
- Loyo, G. La población de México; estado actual y tendencias, 1950-1980. Instituto Mexicano de Recursos Naturales Renovables. Mexico, D.F., 1960.
- Madagascar. République Malgache. Essai de prévision de la population malgache. Tananarive, Service de la Statistique et des Etudes Socio-Economiques, 1963.
- Mauldin, W.P. and D. Akers. The population of Poland, United States Bureau of the Census. International Population Statistics Reports, Series P-90, No. 4, Washington, D.C., United States Government Printing Office, 1954.
- Mortara, G. Previsões sobre o desenvolvimento da população do Brasil na segunda metade do século XX. Estudos Demográficos, No. 95. Laboratório de Estatística. Instituto Brasileiro de Geografia e Estatística, 1954.
- Myers, P.F. and W.P. Mauldin. Population of the Federal Republic of Germany and West Berlin. United States Bureau of the Census, International Population Statistics Reports, Series P-90, No. 1, Washington, D.C., Government Printing Office, 1952.

- Myers, P.F. and A.A. Campbell. The Population of Yugoslavia. United States Bureau of the Census, International Population Statistics Reports, Series P-90, No. 5, Washington, D.C., United States Government Printing Office, 1954.
- Myers, R.J. and E.A. Rasor. Illustrative United States Population Projections, 1952. Actuarial Study No. 33, Washington, D.C., Department of Health, Education and Welfare, November 1952.
- National Council of Applied Economic Research. Population projections of India, 1951-1976. New Delhi, 1960.
- New Zealand. Ministry of Works. Town and Country Planning Branch, A Survey of New Zealand Population, and Analysis of Past Trends and Estimate of Future Growth. Wellington, Government Printer, 1960.
- Nielson, H.C. Population Trends in the United States through 1975. Total United States. Census Regions. Eleven Western States. Menlo Park, Stanford Research Institute, 1955.
- Nieto, B. Proyección de la población de Ecuador, 1950-1980. Santiago de Chile, Centro Latinoamericano de Demografía, 1961.
- Notestein, F.W., I. Taeuber, D. Kirk, A.J. Coale and L.K. Kiser. The Future Population of Europe and the Soviet Union. Population Projections, 1940-1970. Geneva, League of Nations, 1944.
- Organization for European Economic Cooperation. Demographic Trends, 1956-1976, in Western Europe and in the United States. Paris, O.E.E.C., 1961 (Duplicate text in French).
- Recchini, Z. Proyección de la población de México por sexo y grupos de edades 1960-1980. Santiago de Chile, Centro Latinoamericano de Demografía, 1963.
- Roberts, G.W. Population Trends in the British Caribbean Colonies, 1946-1961. Caribbean Economic Review, Nos. 1-2, October 1951, pp. 179-200.
- Roberts, G.W. The population of Jamaica. An Analysis of its Structure and Growth. Published for the Conservation Foundation, Cambridge, University Press, 1957.
- Sanchez, B.R. Proyecciones de la población de la República de Costa Rica para los años 1960, 1965 y 1970. San José, Dirección General de Estadística y Censos.
- Seklani, M. La population de la Tunisie. Situation actuelle et évolution probable jusqu'en 1986. Population (Paris), Vol. 16, No. 3, July-September 1961.
- Selvaratnam, S. Population projections for Ceylon, 1956-1981. Bombay, Demographic Training and Research Centre, 1958.
- Siegel, J.S. The population of Hungary. United States Bureau of the Census, International Population Statistics Reports, Series P-90, No. 9, Washington, D.C., U.S. Government Printing Office, 1958.

Sinha, J.N. A dynamic approach to the study of population growth with special reference to India. The Indian Economic Journal (Bombay), Vol. 3, No. 2, October 1955.

Singapore. Department of Statistics. Population projections of Singapore. Singapore, April 1961.

Somogyi, S. Prospettive demografiche per l'Italia, 1950-1970. Difesa Sociale (Rome), Vol. 34, No. 2, April-June 1955.

Scmoza, J.L. Estudio sobre la evolución future de la población en la Argentina. International Statistical Institute, 29th session, Rio de Janeiro, June 1955.

Somoza, J.L. and L. Llano. Proyección de la población de Bolivia, Santiago de Chile, Centro Latinoamericano de Demografía, 1963.

Thakur, H.N. Population projections for Nepal 1955-1975. Bombay, Demographic Training and Research Centre, 1961.

Thompson, W.S. with the assistance of E.D. Minnis. The future growth of population in the United States and some of its consequences. Chapter XVIII of their book, Population Problems, New York, Toronto, London, McGraw-Hill Book Co., 1953 (fourth edition).

United Nations. Department of Economic and Social Affairs. Manuals on Methods of Estimating Population. Manual III: Methods for Population Projections by Sex and Age. (ST/SOA/Ser.A/25) Sales No.: 56.XIII.3.

United Nations. Department of Social Affairs. Future Population Estimates by Sex and Age. Report I: The Population of Central America (including Mexico), 1950-1980. (ST/SOA/Series A/16) Sales No.: 54.XIII.3.

United Nations. Bureau of Social Affairs. Future Population Estimates by Sex and Age. Report II: The Population of South America, 1950-1980. (ST/SOA/Series A/21) Sales No.: 55.XIII.4.

United Nations. Department of Economic and Social Affairs. Future Population Estimates by Sex and Age. Report III: The Population of South-East Asia (Including Ceylon and China: Taiwan) 1950-1980. (ST/SOA/Series A/30) Sales No.: 59.XIII.2.

United Nations. Department of Economic and Social Affairs. Future Population Estimates by Sex and Age. Report IV: The Population of Asia and the Far East, 1950-1980. (ST/SOA/Series A/31) Sales No.: 59.XIII.3.

United Nations. Economic Commission for Latin America. Some Aspects of population growth in Colombia. (E/CN.12/618) New York, 10 November 1962.

Whelpton, P.K. assisted by H.T. Eldridge and J.S. Siegel. Forecasts of the Population of the United States, 1945-1975. United States Department of Commerce, Bureau of the Census, Washington, D.C., U.S. Government Printing Office, 1947.

Wynne, W. The Population of Czechoslovakia. United States Bureau of the Census. International Population Statistics Reports, Series P-90, No. 3, Washington, D.C., U.S. Government Printing Office, 1953.

E. Labour force

Arriaga, E. Proyección de la población económicamente activa. Venezuela, 1950-1975. Santiago de Chile, Centro Latinoamericano de Demografía, 1961.

Bancroft, G. The American Labor Force. New York, John Wiley and Sons, London, Chapman and Hall, 1958.

Baum, S. and J.W. Combs. The labor force of the Soviet Zone of Germany and the Soviet Sector of Berlin. United States Bureau of the Census, International Population Statistics Reports, Series P-90, No. 11. U.S. Government Printing Office, Washington, D.C., 1959.

Baum, S. The Labor Force of Rumania. United States Bureau of the Census. International Population Statistics Reports. Series P-90, No. 14. U.S. Government Printing Office, Washington, D.C., 1961.

Baum, S. The Labor Force of Hungary. United States Bureau of the Census. International Population Statistics Reports. Series P-90, No. 13. Washington, D.C., U.S. Government Printing Office, 1962.

Belgium. Ministère du Travail. Emploi: l'évolution démographique dans quelques pays européens. Revue du Travail (Brussels), Vol. 62, No. 4, April 1961.

Benjamin, B. Vital Statistics and productivity. Bulletin de l'Institut International de Statistique (Paris), Vol. 34, No. 4, 1955.

Bose, S.R. Labour force and employment in Pakistan, 1961-86: a preliminary analysis. Pakistan Development Review (Karachi), Vol. 3, No. 3, pp. 371-398, Autumn 1963.

Bourgeois-Pichat, J. Perspectives sur la population active européenne. Population (Paris), Vol. 8, No. 3, July-September 1953.

Centro Latinoamericano de Demografía. Estudios de la población económicamente activa. United Nations document E/CN.9/CONF.1/L.1.

Chellaswani, T. Population Trends and Labor Force in India: 1951-1966. Population Review (Indian Institute for Population Studies - Madras), Vol. 2, No. 2, July 1958.

Coale, A.J. and E.M. Hoover. Population growth and economic development in low-income countries. Princeton University Press, 1958.

Cooper, S. Labor force projections to 1975. The influence of the changing composition of the population in the next two decades on the numbers of part-time and full-time workers. Monthly Labor Review Vol. 80, No. 12, December 1957.

- Ducoff, L.J. Human resources of Central America, Panamá and México, 1950-1980, in relation to some aspects of economic development. United Nations, Economic Commission for Latin America, 1960. Sales No.: 60.XIII.1.
- Elizaga, J.C. Proyección de la población masculina económicamente activa de Chile, 1950-1969. Santiago de Chile, Centro Latinoamericano de Demografía, 1963.
- Federici, N. Prospettive di evoluzione delle forze di lavoro femminili Statistica (Bologna), Vol. 23, No. 3, July-September 1963.
- Fougstedt, G. Problems of forecasting the future supply of persons with university training and the demand for their services. Bulletin de l'Institut International de Statistique (Paris), Vol. 39, No. 4, pp. 367-371, 1962 (French Summary).
- Fourastié, J. La croissance des classes jeunes et le problème de l'emploi. Population (Paris), Vol. 11, No. 1, January-March 1956.
- Fourastié, J. La prévision de l'emploi en France. Revue du Travail (Brussels), Vol. 64, Nos. 1-2, January-February 1963.
- France. Commissariat Général du Plan de Modernisation et d'Équipement. Rapport Général de la Commission de la Main-d'Oeuvre. Revue Française du Travail (Paris), Vol. 15, No. 4, 1961.
- France. Haut Comité Consultatif de la Population et de la famille. Les besoins en emplois nouveaux par département de 1960 à 1970. Paris, 1961.
- Francis, R.G. The predictive process. University of Puerto Rico, College of Social Sciences. Social Science Research Center Study. Rio Piedras.
- Garfinkle, S. Changes in working life of men, 1900-2000, Monthly Labor Review, No. 78, March 1955.
- Gnanasekaran, K.S. Labour force projections for India, 1951-1976. Artha Vijñana (Poona) 2. March 1960.
- Gnanasekaran, K.S. Increasing length of working life and its implications. Indian Economic Journal (Bombay), Vol. 7, No. 4, April 1960.
- Hama, H. An estimate of the future labour force in Japan: 1960-1970. Japan, Institute of Population Problems. Annual Reports of the Institute of Population Problems, No. 7, Tokyo, 1962.
- Hannush, B.A. The present socioeconomic conditions in Lebanon and the prospects for economic development. Middle East Economic Papers, 1962 (Edited by Paul J. Klat). American University of Beirut, Economic Research Institute, Dar al-Kitab, Lebanon, 1962.
- Hébette, F. Perspectives de population active pour 1965. Bulletin de l'Institut de Recherches Économiques et Sociales, (Louvain), Vol. 22, No. 1, February 1956.

- Hovne, A. The labor force in Israel. Jerusalem, The Falk Project for Economic Research in Israel, 1961.
- Hussein, H.M.; M.A. El-Shafei; A.M. Shehata; S.M. El-Hammamy; S.H. Barghout and T.E. Safwat. Techniques of manpower assessment and their implications for developmental plans of the United Arab Republic. United Nations Conference on the Application of Science and Technology for the Benefit of the Less Developed Areas. E/CONF.39/B.11.
- Im, T.B. and K.V. Ramachandran. Labor force projections for the Republic of Korea, 1960-1975. Demographic Training and Research Centre, Chembur, Bombay, 1961.
- Institut National de Statistique et des Etudes Economiques (Study prepared by M. Fabvay). La population agricole française. Structure actuelle et évolution. Etudes et Conjoncture (Paris), 11th year, August 1956.
- International Labour Office. Expanded Programme of Technical Assistance. Report to the Government of Israel on Methods of Forecasting Manpower Requirements and Resources. Processed. ILO/TAP/Israel/R.14. Geneva, 1961.
- International Labour Office. Projections of population and labour force. International Labour Review (Geneva), Vol. 83, No. 4, April 1961.
- International Labour Office. The population and labour force of Asia, 1950-1980. International Labour Review (Geneva), Vol. 86, No. 4, October 1962.
- International Labour Office. Methodology of manpower forecasting. United Nations Conference on the Application of Science and Technology for the Benefit of the Less Developed Areas. E/CONF.39/B.26.
- Iowa State University of Science and Technology. Labor mobility and population in agriculture. Papers assembled and published under the sponsorship of the Iowa State University Center for Agricultural and Economic Adjustment. Ames, Iowa State University Press, 1961.
- Jaffe, A.J. and R.O. Carleton. Occupational mobility in the United States 1930-1960. New York, King's Crown Press, Columbia University, 1954.
- Khusro, A.M. Economic development with no population transfers: a study in demands for and supply of labour in the non-agricultural sector of the Indian economy. Occasional Papers, 4. London, Asia Publishing House, 1962.
- Kostakov, V. and P. Litviakov. Utilization of labour resources in the future. Problems of Economics: selected articles from Soviet Economic Journals in English translation. (New York), Vol. 5, No. 7, November 1962.
- Le Clair, M.J. Labor in India. United States Bureau of Labor Statistics and International Co-operation Administration. Bureau of Labor Statistics. Report 188. Washington, April 1961.
- Leridon, F. Dix ans d'expérience de prévision de l'emploi. Population (Paris), Vol. 16, No. 3, July-September 1961.

- Livi Bacci, M. Dinamica demografica e future disponibilit  regionale di mano d'opera. Accademia Nazionale dei Lincei. Quaderno 64. Rome, 1963.
- Macura, M. Labor force analysis and projections needed for planning. United Nations document E/CN.9/CONF.3/L.4.
- Novacco, N. Pr vision pour l'ann e 1975 sur la population italienne selon la qualification professionnelle et l'instruction. Population (Paris), Vol. 16, No. 3, July-September 1961.
- Organization for Economic Co-operation and Development. Session d' tudes internationales sur les techniques de pr vision de l'emploi. In 4 parts. Organization for Economic Co-operation and Development, Paris, 1962.
- Pressat, R. La population agricole en France: structure actuelle et pr visions jusqu'en 1966. Population (Paris), Vol. 12, No. 1, January-March 1957.
- Pressat, R. Vues prospectives sur la population active par d partement de 1960   1970. Population (Paris), Vol. 16, No. 3, July-September 1961.
- Pressat, R. Structure d mographique de la population active agricole. Economie Rurale: Bulletin de la Soci t  Fran aise d'Economie Rurale (Paris), No. 37, July 1958.
- Pressat, R. La pr vision de l'emploi: aper us m thodologiques. Cahiers de l'Institut de Science Economique Appliqu e: Economie du Travail (Paris), Series BB Vol. 122, No. 2, February 1962.
- Prochazca, Z. The labour force of Bulgaria. United States Bureau of the Census. International Population Statistics Reports. Series P-90, No. 16, Washington, D.C., United States Government Printing Office, 1961.
- Prochazca, Z. and J.W. Combs. The labor force of Poland. United States Bureau of the Census, International Population Statistics Reports. Series P-90, No. 20, Washington, D.C., United States Government Printing Office, 1964.
- Ramirez, A.M. La determinaci n de la poblaci n econ micamente activa y su distribuci n por ramas de actividad: el caso de Costa Rica. Revista de Estudios y Estad sticas: Serie Demografica (San Jos ), No. 1, Julio 1961.
- Sadie, J.L. Poblaci n y mano de obra en Chile, 1930-1975. Santiago de Chile, Centro Latinoamericano de Demograf a, 1962.
- Sacks, J. and E. McVoy. Techniques of manpower assessment. United States papers prepared for the United Nations Conference on the Application of Science and Technology for the Benefit of the Less Developed Areas. Vol. XI, p. 31.
- Sauvy, A. Les perspectives d'accroissement du nombre des emplois en France d'ici 1975. Population (Paris), Vol. 16, No. 2, April-June 1961.
- Sherer, J. Labor Force: concepts, measurement and use of data. Journal of Business, Vol. 31, No. 1, January 1958.

- Stewart, C.M. Future trends in the employment of married women. British Journal of Sociology, Vol. 12, No. 1, March 1961.
- Strommer, A. Population development and labor force resources in Finland during 1950-1970. Publications of the National Planning Bureau, Series A.5, Helsinki, 1959, 84 pages.
- Sundrum, R.M.; V.R. Rau and S. Selvaratnam. Manpower resources of Ceylon, 1956-1981. Planning Secretariat, Colombo, Ceylon, 1959. 34 pages.
- Tabah, L. De la previsión económica a la previsión de la mano de obra. Aplicación a la Argentina. Santiago de Chile, Centro Latinoamericano de Demografía, 1961.
- Tabbarah, R. Demographic techniques for manpower planning in developing countries. United States. Department of State. Agency for International Development. Communications Resources Division. Washington 25, D.C., May 1963.
- Tilak, V.R.K. The future manpower situation in India, 1961-1976. International Labour Review (Geneva), Vol. 87, No. 5, pp. 435-446. May 1963.
- United Nations. Economic Commission for Latin America. Analyses and Projections of Economic Development. An Introduction to the Technique of Programming. E/CN.12/363. New York, 1955.
- United Nations. Economic Commission for Latin America. Analisis y Proyecciones del Desarrollo Económico. El desarrollo económico de Argentina. I. Los problemas y perspectivas del crecimiento económico argentino. E/CN.12/429/Rev.1, Mexico, 1959. Sales No. 59.II.G.3.Vol. I.
- United Nations. Department of Economic and Social Affairs. Population Growth and Manpower in the Philippines. A Joint Study by the United Nations and the Government of the Philippines. ST/SOA/Series A/32. New York, 1960. Sales No. 61.XIII.2.
- United Nations. Department of Economic and Social Affairs. Population Growth and Manpower in the Sudan. A Joint Study with the Government of the Sudan on Population and Manpower Problems. ST/SOA/Series A/37. New York, 1964. Sales No. 64.XIII.5.
- United States President. Manpower report of the President and a report on manpower requirements, resources, utilization and training by the United States Department of Labor, transmitted to the Congress, March 1963. Washington, D.C., Government Printing Office, 1963.
- United States. Bureau of Employment Security. Sources of data for manpower projections. Employment Security Research Methods. Handbook Series R-199. Washington, March 1961.
- United States. Department of Labor. State and regional variations in prospective labor supply. United States Department of Labor. Bureau of Labor Statistics. Bulletin No. 893.

United States. Department of Labor. Population and labor force projections in the United States, 1960 to 1975. United States Department of Labor. Bulletin No. 1242. Washington. U.S. Government Printing Office, 1959.

Vimont, C. La population active: évolution passée et prévisions. Paris, Presses Universitaires de France, 1960.

Wolfbein, S.L. Manpower projections and techniques. United States papers prepared for the United Nations Conference on the Application of Science and Technology for the Benefit of the Less Developed Areas. Vol. XI, p. 20. E/CONF.39/B/60.

Ypsilantis, J.N. The labor force of Czechoslovakia. United States Bureau of the Census. International Population Statistics Reports. Series P-90, No. 13, Washington, United States Government Printing Office, 1960.

F. Education

Armstrong, C.M. and M.S. Harris. A method of predicting school-age population. Division of Research, State Education Department, Albany, New York, 1949.

Belgium. Conseil National de la Politique Scientifique. Rapport sur la croissance des populations étudiantes. Brussels, 1961.

Borrie, W.D. and R.M. Dedman. University enrolments in Australia, 1955-1970. A projection. Social Sciences Monographs, No. 10. Canberra, The Australian National University, 1957.

Ceylon. National Planning Council. The Ten-Year Plan. Colombo, Ceylon, The Planning Secretariat 1959, pp. 466-472.

Choudhari, R.E. and K.V. Ramachandran. Projection of primary and secondary school populations for Maharashtra State, 1951-1981. Artha Vijñana (Poona), Vol. 4, No. 2, June 1962.

Gutierrez, H. Proyección de la población escolar de Chile, 1957-1982. United Nations document E/CN.9/CONF.1/L.22.

Im, T.B. and K.V. Ramachandran. Future school populations in the Republic of Korea, 1960-1975. Bombay, Demographic Training and Research Centre, 1962.

Jacoby, E.G. Methods of School Enrolment Projection. Educational studies and documents. No. 32, UNESCO, 1959, 43 pages.

Nadarajah, T. Projections of the school-going population of Ceylon, 1961-1981. Chembur, Bombay, Demographic Training and Research Centre, 1961.

New Zealand. House of Representatives. School enrolment projections for the years 1959-1972. Statement by Hon. P.O.S. Skoglund, Minister of Education, presented to the House of Representatives by Leave, E.2, Wellington, Government Printer, 1959.

Peláez, C. Estimación de la matrícula escolar y de las necesidades de maestros y escuelas en la enseñanza primaria de la República de Panamá, 1960-1980. Santiago de Chile, Centro Latinoamericano de Demografía, 1961.

Pressat, R. Croissance des effectifs scolaires et besoins en maîtres. Population (Paris), Vol. 13, Nos. 1 and 2, pp. 9-38 and 193-214, 1958.

Ruiz, H. Proyección de la población escolar, estimación de la probable matrícula y de las necesidades de maestros y salas de clase en la enseñanza primaria de Guatemala, 1960-1980. Santiago de Chile, Centro Latinoamericano de Demografía, 1961.

Schmid, C.F. and F.S. Stanley. Techniques of forecasting University enrolment. The Journal of Higher Education, Vol. 23, No. 9, December 1952.

Schmid, C.F. et al. Enrolment forecasts, State of Washington, 1963 to 1970. State Census Board. Seattle, Washington, 1962.

Selvaratnam, S. Economic implications of the projected growth of the school-going population in Ceylon. Population Review (Madras), vol. 5, No. 1, January 1961.

Stockwell, E.G. and R.H. Weller. The population of Connecticut: Illustrative projections of school and college enrolment, 1960 to 1980. University of Connecticut, Storrs Agricultural Experiment Station. Progress Report 52; Connecticut Population Report 8. Storrs, May 1963.

Strand, W.H. Forecasting enrolment in the public schools. University Microfilms Publication No. 10.393. Ann Arbor, University Microfilms, 1954.

UNESCO. Datos y analisis demográficos de interés para los programas de educación. United Nations documents, E/CN.9/CONF.1/L.14 and E/CN.9/CONF.2/L.4.

UNESCO (J. Miner and E.S. Solomon) Implications of population trends for planning educational programmes. Document presented to the Asian Population Conference, 1963. (APC/WP/3).

Yun, K. et al. Illustrative projections of school population in the Philippines, 1960-1980. Philippine Statistician (Manila), Vol. 9, No. 4, December 1960.

Zitter, M. Forecasting school enrolment for the United States and Local Areas. The Journal of Teacher Education, Vol. 5, No. 1, March 1954.

G. Households and families

Centro Latinoamericano de Demografía. Demographic information required for housing programmes with special reference to Latin America. United Nations document ST/ECLA/CONF.9/L.12.

France. Institut National de Statistique et de Etudes Economiques. Ménages et logements. Etudes Statistiques: Supplément Trimestriel du Bulletin Mensuel de Statistique. Vol. 12, No. 2, April-June 1961.

- Glick, P.C. Estimates of number of families in the United States: 1940-1960. United States Department of Commerce. Bureau of the Census, Population Special Reports, Series P-46, No. 4, June 1946.
- Glick, P.C. American families. John Wiley and Sons, New York, 1957.
- Glick, P.C. et al. Family formation and family composition: trends and prospects. Washington, U.S. Bureau of the Census, 1963, processes. Published in Sourcebook in marriage and the family (M.V. Sussman, Editor). Boston, Houghton Mifflin, 1963.
- Hall, A.R. and M.R. Hill. Housing demand in Australia, 1959-1974. Economic Record (Melbourne). Vol. 36, No. 76, 1960.
- Henry, L. Structure de la population et besoins de logements. Population (Paris) Vol. 5, No. 3, 1950.
- Henripin, J. Les besoins futurs de nouveaux logements au Canada jusqu'en 1971. L'Actualité Economique (Montreal), vol. 32, No. 2, July-September 1956.
- Kono, S. Household projections for Japan, 1960-1975 Jinko Mondai Keukyu (Tokyo) No. 83, July 1961. (In Japanese with English summary)
- Morales, J.V. Estimated housing requirements in Chile, 1952-1982. United Nations, document E/CN.9/CONF.1/L.18. December 1959.
- Muhsam, H.V. Número y características de las familias y de los hogares censales en relación con los necesidades en materia de vivienda: cálculo y proyecciones. United Nations document E/CN.9/CONF.1/L.15.
- Muhsam, H.V. Datos de población y análisis necesarios para evaluar la demanda presente y futura de viviendas. Translation into Spanish of the United Nations document E/CN.9/CONF.2/L.10 published in Estadística (Washington) Vol. 21, No. 79, June 1963.
- Pressat, R. Un essai de perspectives de ménages. International Population Conference (Vienna), 1959. Union Internationale pour l'Etude Scientifique de la Population. Vienna, 1959.
- Siegel, J.S. Informaciones demográficas para la formulación de programas de vivienda con especial referencia a América Latina. Estadística. (Washington, D.C.), vol. 21, No. 79, June 1963.
- United Nations. Economic Commission for Europe. Report of the Seminar on Housing Surveys and Programmes with Particular Reference to Problems in the Development Countries. Zagreb, 1961. (Mimeographed) ST/ECE/HOU/5.
- United Nations. Economic Commission for Europe. Techniques of surveying a country's housing situation including estimates of current and future housing requirements. ST/ECE/HOU/6.
- United Nations. Economic Commission for Europe. European housing trends and policies in 1957. Geneva, 1958. E/ECE/329.

- United Nations. Proposed methods of estimating housing needs. E/CN.3/274.
- United Nations. Report of the Latin American Seminar on Housing Statistics and Programmes. Copenhagen, Denmark, 2-25 September 1962. Sales No. 63.II.G.14.
- United Nations. Statistical evaluation of housing conditions, existing deficits and future housing requirements in the Latin American countries. ST/ECLA/CONF.9/L.10.
- United Nations. Future housing requirements. ST/ECLA/CONF.9/L.19.
- Walkden, A.H. The estimation of future numbers of private households in England and Wales. Population Studies (London), vol. 15, No. 2, November 1961.
- H. Urban and rural population
- Brown, L.R. Economic Analysis of Far-Eastern Agriculture. United States Department of Agriculture. Foreign Agricultural Economic Report 2, Washington, November 1961.
- Dubois, P. Essai de perspective démographique pour le Royaume du Maroc, Bulletin économique et social du Maroc, Vol. 22, No. 79.
- Forichon, R. and P. Mas. Les problèmes de la répartition du peuplement au Maroc. Bulletin économique et social du Maroc. Vol. 21, No. 76.
- Grauman, J.V. Desarrollo de un modelo para el cambio de población de rural a urbana, referido a Latinoamérica. Estadística (Washington), vol. 20, No. 75, June 1962.
- Hauser, P.M. and H.T. Eldridge. Projection of Urban Growth and Migration to Cities in the United States. Milbank Memorial Fund Quarterly. Vol. 25, pp. 293-307, 1947.
- Peláez, C.A. Proyección de la población urbana y rural menos de 30 años de la República de Panamá hasta 1980. Santiago de Chile, Centro Latinoamericano de Demografía, 1961.
- Peláez, C.A. Proyección de la población urbana y rural de la República de Panamá, 1950-1980. Santiago de Chile, Centro Latinoamericano de Demografía, 1961.
- Pereira, J. dos Santos. A previsão do crescimento das populações urbanas, Edição conjunta con a Universidade da Bahia. Salvador, Brazil, Progresso, 1958.
- Seklaudi, M. Villes et campagnes en Tunisie, Evaluations et prévisions. Population (Paris), Vol. 15, No. 3, June-July 1960.
- United Nations, Economic Commission for Latin America. Analyses and Projections of Economic Development, III. The Economic Development of Colombia. E/CN.12/365/Rev.1, Geneva, 1957.

United Nations, Economic Commission for Latin America. Division of Social Affairs. Proyección de la población urbana y rural de Cuba (con estimaciones de la fuerza de trabajo, de la población en edad escolar y del grado de alfabetismo. Santiago de Chile, Abril de 1960. (Ditto).

I. Other area projections

Bocaz, A. Curva de Gompertz aplicada al crecimiento de la población de la ciudad de Santiago: Estadística Chilena, No. 10-11, Oct.-Nov. 1953.

Bogue, D.J. A technique for making extensive population estimates. Journal of the American Statistical Association (Washington, D.C.) Vol. 45, No. 250, June 1950.

Bogue, D.J. An Estimate of Metropolitan Chicago's Future Population: 1955 to 1965. Published jointly by the Chicago Community Inventory, University of Chicago and the Scripps Foundation, Miami University, Oxford, Ohio, 1955.

Bogue, D.J. and D.P. Dandekar. Population trends and prospects for the Chicago-North-Western Indiana Consolidated Metropolitan Area: 1960-1990. Chicago, Population Research and Training Center, University of Chicago, March 1962.

Boustedt, O. Typification of communities by the development of the population as a basis for regional population forecasts. Bulletin de l'Institut International de Statistique. (Stockholm) Vol. 36, No. 4, 1958.

Carrothers, G. Population projection by means of income potential models. Reprinted from: Papers and Proceedings of the Regional Science Association, Vol. 4, 1958.

Choudhari, R.E. Population projections for Maharashtra State, 1951-1981. Bombay, Demographic Training and Research Centre, 1961.

Clapp, R.F. Metropolitan Washington: Population Trends in the Sixties. Prepared for the National Capital Planning Commission, National Capital Regional Planning Council and the Government of the District of Columbia (Washington), 1962.

Davis, K. and E. Langlois. Future Demographic Growth of the San Francisco Bay Area. Berkeley, Institute of Governmental Studies. University of California, 1963.

Federici, N. Le ricerche demografiche in funzione dei piani regionali di sviluppo economico. Statistica (Bologna) Vol. 21, No. 3, Jul.-Sept. 1961.

France. Institut National de Statistique et des Etudes Economiques. Perspectives d'évolution naturelle de la population par département. Application à la population active. Etudes Statistiques. Supplément Trimestriel du Bulletin Mensuel de Statistique, No. 4, October-December 1957.

Goldstein, S. and K.B. Meyer. Population Projections, Rhode Island cities and towns, 1970 and 1980. State Planning Section, Publication 5, Rhode Island Development Council, Planning Division. Providence, 1963.

- Hagood, M.J. and J.S. Siegel. Projections of the regional distribution of the population of the United States to 1975. Agricultural Economic Research, vol. 3, No. 2, 1951.
- Hama, H. An estimate of the future population by prefectures in Japan: 1965-1970. Annual Report of the Institute of Population Problems, No. 8, Tokyo, Ministry of Health and Welfare, 1963.
- Hawaii. State Department of Planning and Economic Development. Preliminary projections of the population of Hawaii by judicial district, 1985. Statistical Report 8, Honolulu, 1963.
- Hodkinson, W. Estimates and projections of the population in large cities and their use in urban development planning. United Nations documents E/CN.9/CONF.1/L.16 and E/CN.9/CONF.2/L.5.
- Hoult, T.F. and A.J. Mayer. The population revolution in Detroit. Detroit, Wayne State University, Institute for Regional and Urban Studies. February 1963.
- Hoyt, H. The growth of cities from 1800 to 1960 and forecasts to year 2000. Land Economics. Vol. 39, No. 2, May 1963.
- Isard, W. et al. Methods of regional analysis: an introduction to regional science. New York, London, published jointly by the Technology Press of Massachusetts Institute of Technology and John Wiley and Sons, Inc., 1960.
- Maryland. State Planning Department. Maryland population forecasts, 1965 and 1970, for political subdivisions by age. State Planning Department Publication No. 119, Baltimore, 1961.
- Newcomb, R. Changing forces which affect city growth. Urban Land, Vol. 18, No. 9, October 1959.
- Panero, M. Previsioni sullo sviluppo demografico nel decennio 1957-1967. Documenti della Citta di Milano 6, 1958.
- Peck, P.W. National planning in Denmark. Town and Country Planning. Vol. 31, No. 2, February 1963.
- Pickard, J.P. Metropolitanization of the United States. Urban Land Institute. Research Monograph 2, Washington, 1959. 95 pp. (processed).
- Pressat, R. Evolution et perspectives régionales de population jusqu'en 1965. Population (Paris), vol. 11, No. 2, April-June 1956.
- Kamachandran, K.V. Population projections specially with regard to small areas, Maharashtra: a case study. Paper presented at the Asian Population Conference, 1963.
- Regional Plan Association (New York) Spread City: projections of development trends and the issues they pose: the tri-State New York metropolitan region, 1960-1985. Regional Plan Association, New York, 1962.

- Roberts, G.W. Provisional assessment of growth of the Kingston-St. Andrew area, 1960-1970. Social and Economic Studies (Jamaica), Vol. 12, No. 4, pp. 432-441, December 1963.
- Rother, H. et al. Estudio de la población de Bogotá (Distrito Especial). Oficina de Planificación, Departamento de Investigación, Bogota, 1958.
- Ryan, R.H. et al. Paris, Texas, from farm to factory. University of Texas. Bureau of Business Research. Area Economic Survey No. 14, 1963.
- Sanchez, B., R. et al. Proyecciones de la población de la República de Costa Rica, segun sexo y edad por provincias y cantones, para. 1965. Revista de Estudios y Estadística, No. 3, Serie Demografica, No. 2 (San José), July 1962.
- Schmitt, R.C. A method of projecting the population of Census tracts. Journal of the American Institute of Planners (Washington, D.C.), Vol. 20, No. 2, Spring 1964.
- Schneider, J.R.L. Local population projections in England and Wales. Population Studies (London), Vol. 9, No. 1, July 1956.
- Siegel, J.S. Forecasting the population of small areas. Land Economics, Vol. 29, pp. 72-88, 1953.
- Siegel, J.S. Some aspects of the methodology of population forecasts for geographic subdivisions of countries. Proceedings of the World Population Conference, 1954 (Rome), Vol. III, Meeting 13, pp. 113-133. United Nations, New York, 1955, Sales No.: 55.XIII.8, (Vol. III).
- Siegel, J.S.; H.S. Shryock and B. Greenburg. Accuracy of postcensal estimates of population for states and cities. American Sociological Review (New York) Vol. 19, No. 4, August 1954.
- Stanbery, V.B. Some new techniques for area population projections with illustrative projections of California's population. Los Angeles, John Randolph Haynes and Dora Haynes foundation, Sept. 1959.
- Stockwell, E.G. and D. Ingalls. The Population of Connecticut: illustrative projections by age and sex, 1960-1980. University of Connecticut, Agricultural Experiment Station. Bulletin 375. Storrs, January 1963.
- Tarver, J.D. Computer programs for estimating and projecting county, city and other local subdivisional populations. Behavioral Science, vol. 8, No. 2, April 1963.
- Thaden, J.F. Population of Michigan Counties: projections to 1970. Michigan State University. Institute for Community Development. Technical Bulletin B-24. East Lansing, 1962.
- University of Maryland. Predicting population changes in small areas. Bureau of Business and Economic Research. Studies in Business and Economics, Vol. 14, No. 4, March 1961.

Vaidyanathan, K.E. Population projections for Madras State, 1961-1981. Bombay, Demographic Training and Research Centre, 1961.

White, H.R. Empirical study of the accuracy of selected methods of projecting State populations. Journal of the American Statistical Association (Washington, D.C.), Vol. 49, No. 267. September 1954.

White, H. and J.S. Siegel. Projections of the population by States, 1955 and 1960. United States Department of Commerce. Bureau of Census Current Population Reports. Population estimates Series P-25, No. 56. Washington, D.C., 1952.

DEMOGRAPHIC PUBLICATIONS OF THE UNITED NATIONS

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Studies of population trends and problems

The Determinants and Consequences of Population Trends. A summary of findings of studies of interrelationships of demographic, economic and social factors based on a world-wide survey of scientific literature. English, French, Spanish. 404 pp., \$5.00*. ST/SOA/Series A/17. Sales No.: 53.XIII.3.

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Seminar on evaluation and utilization of population census data in Latin America. (Santiago, Chile, 30 Nov.-18 Dec. 1959). English, French, Spanish. 98 pp. E/CN.9/CONF.1/1/Rev.1-ST/TAO/SER.C/46. (Non-sales item, 1960).

Seminar on evaluation and utilization of population census data in Asia and the Far East. (Bombay, India, 20 June-8 July 1960). English, French. 93 pp. E/CN.9/CONF.2/1-ST/TAO/SER.C/47. (Non-sales item, 1961).

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