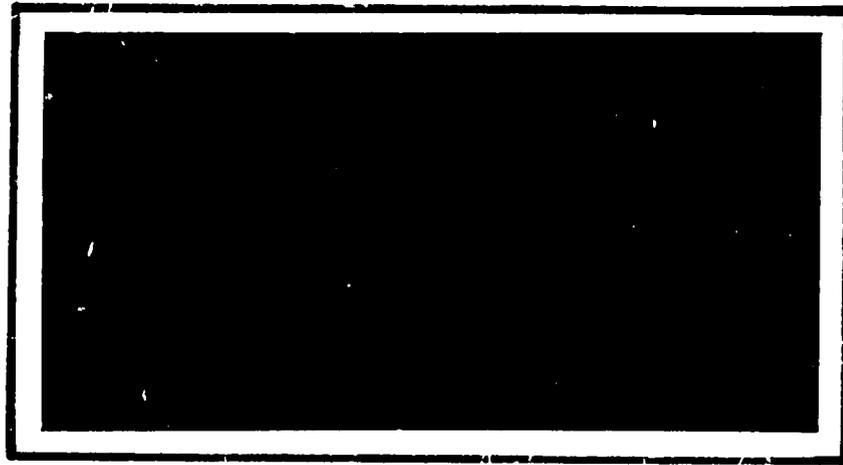




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EVALUATION OF THE
POPULATION STUDIES AND RESEARCH INSTITUTE
UNIVERSITY OF NAIROBI

AID/pha/C-1164

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EVALUATION OF THE
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I. INTRODUCTION

A. PROJECT PURPOSE

The purpose of AID Agreement No. 165-1-607 is to create at the University of Nairobi a Population Studies and Research Center (PSRC) capable of performing high-quality population/family planning training and research required by Government ministries, public and private agencies, international organizations and the University itself. The multi-disciplinary PSRC is expected to focus the broad range of University skills and resources on the population field and provide much-needed support for the efforts of these other organizations. It is expected that the PSRC will bring to bear a measure of scientific objectivity and creative thought to the population issues facing Kenya.

To accomplish the above goals, the grant supports:

- 1) the establishment of a multi-disciplinary, fully operational Population and Research Center staffed by highly educated Kenyan professionals who will provide direct assistance in the area of research and training to the National Family Welfare Center which has direct responsibility for expansion of family planning services in the rural areas;
- 2) the development of a research segment within the PSRC that will focus the talents and efforts of the Center's staff, students and associate research fellows from the many areas of the University on policy-relevant activities which will provide responses to the research and evaluation needs of government ministries and other organizations involved in population/family planning activities; and
- 3) the development of a training program which will include a post-graduate program and infusion of new population/family planning curricula into undergraduate courses in various departments of the University.

B. PLAN AND SCOPE OF THE EVALUATION

Substantial delays in program implementation (see Appendix A) and some changes in program structure (see Section V) have occurred in the first 11 months of operation. These delays and changes, as well as their implications for the realization of program objectives, can be understood only in the light of the project's actual experience in the inaugural year. It is hoped that the following report will make this experience clear, and that the conclusions and recommendations that seem to us to follow from the events of the first year will be better understood as a result of this analysis.

More specifically, the scope of the evaluation includes:

- 1) provision of information concerning progress toward meeting the purposes, objectives and intended operational aspects of the PSRC, as defined in the bilateral agreement (ProAg) between USAID and the University and the contract between AID and Population Council;
- 2) review of the University of Nairobi's expectations from and commitment to this project and problems, if any, in these categories; and
- 3) recommendations as to those terms and arrangements under which the project might be most successfully continued.

Appended to this report is a listing of all the persons interviewed during the evaluation (see Appendix B).

II.. RESEARCH

Research is, of course, a crucial component of the Institute's mission. Table 1 indicates research activities that have been completed or those that are in progress.

Given the difficulties of the first year (in particular, the delayed arrival of the team leader, the early departure of the second team member, and the inability, to date, to complete what would have been the third team appointment, in addition to the problems of interaction and communication noted throughout the report), this table indicates a substantial total research achievement. This achievement is, of course, not uniform. Some papers; e.g. those by D. Sly, are largely descriptive, while others have greater theoretical and applied significance. Professor Henin's contributions, in particular, are suggestive of the kind of work that was most hoped for in the original project design, in that his papers respond effectively to the perceived needs of key Ministries for population data and instruction (see Section IV-C).

As to the future, we see, on the one hand, no structural obstacles regarding the Institute's access to data, including the data held by the Central Bureau of Statistics (see Section IV), which cannot be overcome on the basis of greater consultation concerning research objectives and methodology between the Institute and other data holding agencies. On the other hand, we see every prospect that Ministry requests to the Institute for Population Research will increase proportionately with the growth of the Institute's staff and research capacity.

Finally, as we have confidence in the competence and scholarly productivity of present and prospective Institute staff, we believe that Institute research output can eventually reach and even possibly exceed the level anticipated in the original proposal. We would only add to this the observation that in our view the quality of this output can best be assured by the early approval and strict application of guidelines for the evaluation of the Institute supported research projects which have already been developed by a subcommittee of the original Research and Training Board. These guidelines should be applied to currently pending proposals, as well as to those which will be submitted in the future. Moreover, it is assumed that in the practical application of these guidelines every effort will be made to balance the distribution of awards in such a way that population research capacity is strengthened on a University-wide basis.

Table 1. Population Studies and Research Institute. Research Completed and in Progress.

<u>Researcher</u>	<u>Title of Research</u>	
	<u>Completed</u>	<u>Requested By:</u>
D. Sly	Life-time Migration Patterns in Kenya, 1969	Internal Document
D. Sly	Urbanization in Africa	Internal Document
D. Sly	Modern Economic Sector Development and Population Change	Internal Document
R. Henin	Alternative Population Projections, 1969-1989 (with reference to demographic trends in Kenya)	Ministry of Finance and Planning
R. Henin	District Population Profiles	Ministries of Finance and Planning and Health
R. Henin	Population Development and Economic Planning*	Ministries of Finance and Planning and Health
R. Henin	Population Projections in Regional Economic Planning	IUSSP Committee on Urbanization and Population Redistribution
S. Ominde	Population Growth and Resource Development in Africa	IGU Regional Conference Lagos, August 1978
<u>In Progress</u>		
R. Henin	Some Aspects of the Determinants of Fertility in Kenya	Ministry of Health and World Bank
R. Henin	Population Trends in Kenya and Their Implications for Development	National Academy of Sciences
S. Ominde, R. Henin and D. Sly	Population and Development in Kenya (book)	Internal Document

* Copy of this document accompanies the report.

III. TRAINING

A. EXTERNAL GRADUATE STUDY

The process of identifying, preparing and dispatching students in the first year of the grant for external graduate study in population, as provided in the Project Agreement, has proven very difficult. (Indeed, although the program is approximately a year old, the first Kenyan candidate will not formally depart for training until September, 1978). In part, the need technically to complete the above process almost immediately after the arrival of the contract team leader in July, 1977 generated great pressure on all parties, and resulted in serious communication and consultation gaps and misunderstandings. These consultation problems were not merely a function of the pressure of time, but reflected as well a general lack of communication within the Institute itself and between the Institute and other parties. ^{1/} Fortunately, given the significance of the external training program (for Kenyanization represents one of the basic intentions of the grant), this lack of communication regarding fellowships seems now to be less pronounced, and is, in our view, likely to be reduced still further in the months ahead. In any event, past delays and withdrawals from the program were almost certainly a natural consequence of this earlier situation.

The current status of the program is suggested in Table 2. In interpreting this table, it should be noted that the original training plan called for the provision of external study fellowships to six Ph.D. and give M.A. candidates. To date, however, no M.A. participants have been selected. This concentration on the Ph.D. degree reflects an internal judgement as to the greater utility of the higher degree within the context of the University's staff development program.

^{1/} A major concern among prospective nominees has been and continues to be the question of their affiliation with the University during training and upon return. This concern is two-fold: first, a University appointment prior to departure is necessary so that they may receive support for their families (i.e. study leave status) while they are away; and secondly, they would prefer to be assured of reintegration with the University upon return. Added to this is the misperception on the part of many that the training would lead to overspecialization and hence limited employment opportunities in Kenya. This seemed to be the result of a misunderstanding that studied would lead to training in Demography only.

Table 2. Status of Nominees for External Training.

<u>Name</u>	<u>Status</u>	<u>Dept. Affiliation Nairobi</u>	<u>Field of Training</u>	<u>School Abroad</u>	<u>Beginning Date</u>
Kasiani	Approved	PSRI*	Sociology	Fla. St.	Sept. 1978
Ayiemba	Approved	Geography	Demography	Fla. St.	Jan. 1979**
Gatara	Approved	None	Applied Public Health	U.N.C.	Sept. 1978
Mbugua- Mazrui	Approved	PSRI*	Demography	Penn.	Sept. 1978
Gatangi	Approved	None	Sociology	Stanford or ?	Jan. 1979
Oucho	Approved	Inst. of Afr. Studies	Geography	U.N.C.	Jan. 1979
Musyoki	Approved	Inst. of Dev. Studies	Soc. Dem.	Fla. St.	Sept. 1978
Odera	Withdrawn	Inst. of Afr. Studies	Soc. Dem.	----	-----
Mathu	Withdrawn	Inst. of Afr. Studies	Sociology	----	-----
Githinji	Withdrawn	Community Health	Med. Soc.	----	-----
Kibua	Withdrawn	Economics	Economics	----	-----

3 New Nominations by
PSRI Expected

-----No Information-----

* Temporary. Intention is to arrange for them to occupy existing posts.

** One year program.

As of August 10th, there had been 11 nominations for external training. USAID/Kenya has been notified that three additional nominations will be forthcoming from the Institute, but little information is available concerning them. At the moment, four of the original 11 nominations have been withdrawn or terminated. The remaining seven are prepared to depart or are awaiting word of their departure date. Finally, four of these seven are scheduled to begin training in the United States during the Fall of 1978, and three expect to begin in January of 1979.

The University affiliation of the seven persons who will begin training is as follows: One person in the Institute for Development Studies has apparently arranged for study leave; the Population Studies and Research Institute is attempting to hire three others so that they will return, upon completion of training, to the Institute; the remaining three have no assurance of appointment at the University upon their return.

Whether the participant training program can achieve a replacement of the area-skills of the Population Council advisors is also unclear. Of the seven who will definitely depart, five will pursue programs of Sociology-Demography, and the other two will train in Applied Public Health and Geography, respectively. Thus, although these disciplines coincide with those of three key departments of the University (Sociology, Geography and Community Health), it appears that:

- 1) no Kenyan counterpart for the expected Population Council advisor in Family Planning/Maternal and Child Health has been selected for training, and
- 2) no Kenyan counterpart for the Population Council advisor in Economics has been approved for external training.

Beyond this, we are also concerned about the adequacy of current contract agreements relating to the status of Ph.D. candidates during on-site thesis research. Specifically, it is currently envisaged that Ph.D. candidates will be funded by the grant for three years in the United States, during which time they will have completed course work, comprehensive examinations, and completed an approved thesis prospectus. Although this appears to be a reasonable program, inadequate consideration has been given to possible problems that may occur in the following stage of thesis research. For example, how will those not receiving appointments at the University be supported? What funds are available should it be necessary for the candidate to return more than once to the United States for information and consultation? What provisions have been made for support of students beyond the life of the project? The last point is particularly important inasmuch as it is likely that only one of the participants will complete training prior to June of 1983. These questions should not be considered as inclusive, but should form the basis for a general discussion of the adequacy of funding arrangements for Ph.D. candidates among all concerned parties.

Evaluation. If no further delay in the dispatching of the seven approved Ph.D. candidates occurs, one will be able to conclude that, in spite of the reservations mentioned above, the external training mission has been successfully launched. This fact seems to us to outweigh in significance the short-term negative consequences of the preceding delay, but not to outweigh the necessity of removing totally those failures in communication and consultation between the Institute and other parties which have been in a larger sense at the root of the general problem of successfully establishing the Institute within the University of Nairobi.

B. POPULATION STUDIES WITHIN THE UNIVERSITY OF NAIROBI

As the local training program within the University of Nairobi is intended naturally to complement the external program, it is vital that relevant teaching contributions by Institute staff members be made as soon as possible. Unfortunately, the contribution to date, particularly with regard to collaboration with other departments, has been quite limited. Table 3 indicates the nature of the instructional contribution up to the present, and also planned activities for the immediate future.

This is admittedly a modest record, due in part to lack of staff, but also---apart from staff size---to obstacles of a more serious nature. These obstacles, to be discussed more fully in Section IV, helped to prevent the extensive collaboration of Institute personnel in the population related courses of other departments. In part, the problem had to do with the ambiguous teaching status of the population program. This ambiguity was approached but not resolved by the Academic Senate and the University Council during May-June when these bodies granted formal instructional power to the newly created Institute (see Statutes).

It remains, however, for this power to be defined, approved and exercised by the Academic Senate and the Institute. (Our analysis and evaluation of prospects in this area may be found in Section V - Current Status of the Institute.) Suffice it to say at this point that extensive instructional contributions by Institute staff members, particularly in population courses in other departments, have not yet been made. Moreover, if these instructional opportunities are not established or realized more fully in the near future, a basic objective of the program will have been frustrated, and, indeed, the gravest doubt will then exist as to the viability of the entire program.

Table 3. Local Training. Courses and Programs Given and Anticipated.

<u>Instructor</u>	<u>Dürätion of Course</u>	<u>(Approx.) Enrollment</u>	<u>Source of Enrollment</u>	<u>Nature and Title of Course</u>
Henin	3 mos.	12	Participants, RED and Faculty of Medicine	Techniques of Demography
Sly	3 mos.	12	"	Social Demography
Nam	2 wks.	12	"	Population Education
Chisnais	3 days	12	"	Population and Development
Gorosh and Foreit	3 wks	7	MOH Research Officers	Evaluation for Mgt. Techniques
Muinde	Term	30	University	Population Geography
Ominde	Term	30	University	Population Geography
Henin	Several terms	?	Dept. Community Health	Statistics and Demography
Henin	3 wks.	?	Dept. ObGyn	Epidemiology and Biostatistics
Staff	5 seminars of 3 days each	250	Ministry of Finance and Planning	National Provincial and District Population and Planning Seminars

Supervisory

David Sly supervised one M.A. thesis.

Roushdi Henin is supervising 2 Ph.D. dissertations and one M.A. thesis.

* To be offered Fall Term 1978.

IV. RELATIONS BETWEEN THE PSRI AND OTHER PARTIES

A. FACULTY OF ARTS

For a variety of reasons, having to do primarily with the lack of consultation and coordination in the formative stages of the project, some departments in the Faculty of Arts came to the initial conclusion, with some apparent justification, that the Population Center represented a threat to their interests. In short, the actions of the then Center, in its early attempts to establish itself in research, training and teaching, apparently tended in some cases to disturb and possibly even distort the activities and prospects of other departments. Thus, in its initial actions and enthusiasm the then Center was perceived by others as seeking to exercise, or simply as having, an undue influence on the students, faculty, curriculum and research of other departments.

With the passage of time, and with the gradual administrative integration of the population program into the structure and life of the University, these problems have apparently been reduced. Consequently, with the recent passage of statutes formally establishing the population program as an Institute, we have some reason to believe that a long and frequently awkward period of adjustment, of settling in, may be coming to an end, and that the considerable energies consumed in the past by all parties in this process of adaptation may soon be applied in more externally productive directions.

More specifically, we were assured by Chairmen in the Social Sciences that after adequate consultation they will encourage and welcome participants of Institute staff on a collaborative basis in their population courses.

Indeed, given the assumption of adequate consultation and dialogue, no irreconcilable problem in any phase of the relationship between the Institute and relevant departments, including the joint identification of prospective Institute staff and departmental fellows for external study, and the coordination of Institute support for population related research in the various departments, need occur. This, of course, presumes, as is our hope and expectation, that the Institute is now prepared to function as a resource to enhance and complement the quality of the educational program in population related areas in each relevant discipline.

B. OTHER INSTITUTES WITHIN THE UNIVERSITY OF NAIROBI

The Population Institute has not yet established significant links with other Institutes. However, it should be pointed out here that there is considerable opinion within the University that the new Institute should approximate as closely as possible the structure and function of the more established Institutes; that is, that it concentrate internally on research and externally on collaborative teaching efforts in population courses in other departments. Doubtless, this position will be strongly represented in the final definition of the Institute's role by the Academic Senate of the University of Nairobi. For our part, we believe (as discussed in Section V) that future events will help to reconcile this view with the possible development of an internal curriculum and certificate awarding capacity within the Institute itself.

C. MINISTRIES AND THE FACULTY OF MEDICINE

1. Ministry of Finance and Planning (Rural Planning Division).

Progress has been significant in creating channels of communication, developing working arrangements and responding to expressed needs of this Ministry. So much so that this experience seems to us an ideal-typical model of what might be possible in other relationships.

At the specific request of the Ministry, the Institute has organized and prepared materials for a series of four seminars (beginning in August, 1978) designed to develop an understanding of the importance of population factors in social and economic planning among national, provincial and district policy makers numbering close to 4,000 persons. (see Appendix C). An important development in connection with this project is that UNFPA has indicated interest in awarding a grant to the Institute in the amount of \$87,000. Part of these funds, together with grants from the Ministry of Finance and Planning and USAID, will finance the Population Seminar Program.

Beyond this, the Rural Planning Division has identified additional areas in which requests for Institute assistance will be made.

2. Ministry of Health (National Family Welfare Center - NFWC).

Delay in the appointment of a Population Council advisor with skills in family planning and maternal and child health has seriously hampered the capacity of the Institute to respond to NFWC needs. On the other hand, NFWC has had to confront some staffing difficulties of its own and so could not take full advantage of the Institute. Nonetheless, short-term advisors, assisted by Institute staff, have provided in-service training for research officers of the Research and Evaluation Division of NFWC. In addition, NFWC staff have attended seminars and lectures given at the Institute, and discussions have taken place as to how the Institute might provide graduate training for officers of the Research and Evaluation Division.

3. Central Bureau of Statistics.

There is clear recognition on the part of the Central Bureau of Statistics (CBS) that the PSRI can provide important services via its analytical capacity and technical knowledge. Indeed, the Institute has already consulted with the Bureau concerning the tabulation programs and interview schedules for the 1977 and 1978 National Demographic Surveys.

The CBS has also requested that the Institute advise on the Pilot Census Project and conduct the analysis of data in addition to advising in the taking of the 1979 Population Census of Kenya.

Beyond the foregoing, the future accessing of data by the Institute will require further discussions between the two bodies regarding research priorities and procedures. Given such consultation, which must involve on the part of the Institute greater preparation and initiative than it has shown in the past, we are assured by the Bureau that no serious difficulty in future collaboration need exist.

4. Faculty of Medicine, University of Nairobi.

As in the case of the Ministry of Finance and Planning (see Section IV), the relationship between the Institute and the Faculty of Medicine is to be held up as a model of the kind of service and cooperation that can and should exist in all the Institute's relationships with other departments and faculties.

a) Department of Community Health - Departmental staff have attended lectures and seminars given by the Institute during the first year. In addition, a course in Statistics and Demography (see Table 3) will be offered in the Department by the Institute during the Fall term of 1978. Provision has also been made for short-term training for Departmental personnel as and when they return from field operations.

b) Department of Obstetrics and Gynecology. - At the request of the Department, the Institute has prepared and will offer a course in Epidemiology and Biostatistics during the Fall term of 1978.

D. THE UNIVERSITY

1. Institute Appointments.

We were assured by the Deputy Vice Chancellor that if the Population Council fully informs and consults with the Appointments Committee in the matter of filling the two remaining contract posts, that its assessment and recommendations will be given the most serious consideration, and that the Administration and the Appointments Committee will do all they can do to expedite the appointment process.

2. Training.

We were similarly assured by the Deputy Vice Chancellor that the Administration of the University of Nairobi will encourage all parties concerned to implement the Population Institute's teaching mission; this mission to be carried out in collaboration with the relevant departments, and perhaps ultimately through the Institute's own curriculum as well.

3. Consultation.

Finally, we were assured by the Deputy Vice Chancellor that the Administration of the University of Nairobi will use its good offices to encourage all concerned parties to enter into joint discussion of the evaluation report and recommendations.

V. CURRENT STATUS OF THE PSRI

The current formal status of the population program is described in the following document:

UNIVERSITY OF NAIROBI

STATUTES FOR THE POPULATION STUDIES AND RESEARCH INSTITUTE:

1. The Population Studies and Research Institute shall in relation to matters specified in Section 3 and 4 be governed by a Board which shall consist of the following members:-
 - (a) The Director of the Institute, who shall serve as the Chairman of the Board.
 - (b) All full-time academic staff of the Institute.
 - (c) Chairmen of the following Departments or their nominees:-
 - Economics
 - Geography
 - Sociology
 - Educational Administration, Planning & Curriculum Development
 - Obstetrics and Gynaecology
 - Paediatrics and Child Health
 - Community Health
 - History
 - Government
 - Mathematics
 - Philosophy and Religious Studies
 - (d) Deans and Directors of the following Faculties and Institutes or their nominees:-
 - Faculty of Agriculture
 - Faculty of Law
 - Faculty of Veterinary Medicine
 - Institute for Development Studies
 - Institute of African Studies
 - Institute of Adult Studies
 - (e) Such other members, not exceeding five in number and not being members of the full-time academic staff of the University appointed by Senate on the recommendation of the Board.

2. The Board of the Population Studies and Research Institute may at its discretion, invite other persons to attend meetings in advisory capacity, provided such persons shall not have a right to vote.
3. The Board of the Population Studies and Research Institute shall have the following powers:-
 - (a) to formulate policies and make recommendations to Senate on the annual programmes of work of the Institute.
 - (b) to recommend courses of instruction leading to the award of certificates and other distinctions as may be authorized by Senate.
 - (c) to regulate the conduct of examinations in the courses assigned to the Institute.
 - (d) to recommend to Senate the names of examiners for appointment.
 - (e) to consider and make recommendations on the annual budget of the Institute for approval by Council through the appropriate University Committee.
 - (f) to consider the Director's annual report for transmission to Council through Senate.
 - (g) to deal with any matters as may be referred to it by Senate from time to time.
 - (h) to determine the rules governing the procedures to be followed at the meetings of the Board.
 - (i) to appoint its sub-committees to consider and report on any matters relevant to the Institute.
4. The Population Studies and Research Institute shall be responsible to Senate for the promotion of Population Studies in the University, and to conduct population related research.
5. The Board shall meet at least three times in each academic year.
6. There shall be meetings of all full-time members of the academic staff of the Institute at least once a term.

This document confers institutional status on the Population Studies and Research Program and empowers it "to recommend (to the Academic Senate) courses of instruction leading to the award of certificates and other distinctions as may be authorized by Senate." While such a status and such powers were not anticipated in the original project proposal, one must bear in mind that they are merely means or tools to be used or defined as may be necessary to achieve the primary objective of the Institute. This objective is stated in Article 4 of the above Statutes and one should note that this objective contains the essence of the original intention of the grant; namely, to promote population research and the demographic training of Kenyan personnel.

More specifically, the power granted to the Institute in section '3b' of the Statutes is only the power to recommend to the Senate courses of instruction when this may be appropriate. It follows, that this need would have to be apparent to both the Institute and the Senate before positive action could be taken. Given this procedure, it is unlikely that the Institute's internal curriculum will be approved precipitously or prematurely.

Thus a closer examination of the Statutes suggests that they are not necessarily hostile to the basic training and research objectives of the grant. Both these objectives can be accomplished, it seems to us, within the evolving structure of the Population Institute. Indeed, as this structure emerges from the crucible of local experience and reflects a reasonable balance of local interests, it seems to us not unreasonable to conclude that it is at least as likely as the original model to achieve the above ends.

More specifically, actual collaborative teaching and participation in population related courses in other departments by Population Institute staff (a major concern of the original proposal) can and should go forward almost immediately. In fact, as this training function can be carried out directly, existing curricula at undergraduate and postgraduate levels being already in place, without the delays inherent in the careful consideration and evaluation by the Academic Senate of an entire internal Institute curriculum, it would seem only prudent to begin in this way. That is, to work initially through departments and, on the basis of this experience, to assess what further purpose, if any, might be served by the introduction of an autonomous Institute curriculum and by the awarding of an independent Institute certificate.

These questions and issues regarding the viability of an autonomous Institute program, in a sense so difficult to answer in the abstract, can perhaps be approached most reasonably on the basis of the experience gained in the departments. On the basis of this experience, all parties could assess the capacity of existing curricula in relevant departments to absorb and expand with Institute assistance to meet population training needs within the University.

Specifically, if the departments, working in concert with one another and Institute staff, were able fully to absorb the population training mission, there would be no need to duplicate (or even dilute) this program in the Institute itself. Conversely, if the departmental structure, even with the fullest assistance of Institute staff, cannot fully absorb or promote adequately population training in the University, the Institute would then be able to present a curriculum which all would recognize and accept as speaking to this unmet need. Consequently, this development, should it occur, would be an organic outgrowth of an earlier experience in the departments, an experience revealing a need for and student interest in further population study.

In any event, we are concerned about the timing of the two stages of population study (that within departments and that within the Institute), and we believe that the attempt at this time to advance both simultaneously would be wasteful and divisive. Worse still, in our opinion, would be the abandonment of the departmental option in favor of an immediate Institute curriculum and certificate awarding program. In this option, the Institute runs the obvious, and in our view unacceptable, risk of mounting a program and offering a certificate which may lack broad based student and faculty support. Without this support, of course, the program would be literally marginal and the proposed certificate of questionable value.

Finally, it seems to us natural and appropriate that these concerns will arise in the University's own deliberations, and we are confident that the Institute, the Academic Senate and the University as a whole will confront them forthrightly and productively.

A. SUMMARY OF PSRI ACCOMPLISHMENTS AND DIFFICULTIES: THE FIRST YEAR

On the positive side, one would note;

- 1) that the population program has been formally defined and legitimated by the Senate and the Council of the University;
- 2) that the University has agreed to fund four permanent lines in the Institute now rather than at the end of the external training period;
- 3) that the Ministry of Finance and Planning and the Ministry of Health have supported the Population Institute;
- 4) that another external funding agency has indicated support for the Institute; and
- 5) that some useful research and training contributions have been made.

Given the problems of the first year, this is not an insignificant record of achievement.

Substantive difficulties of the first year, on the other hand, contributing to serious delays in program implementation (see Appendix A) have had most to do with the problem of creating an appropriate identify of place for the population program in the structure of the University. This process is discussed in the following section.

VI. COMMENT AND CONCLUSION

Due primarily to a lack of adequate communication and consultation in the planning and launching of the population program, this effort had a rather severe impact on the local University structure. Specifically, the new program disturbed the existing equilibrium and raised a great deal of dust which is only now settling. In this connection, it is to be hoped that the Statutes referred to earlier are symptomatic of the population program's gradual assimilation into the academic and socio-economic structure of the University. Finally, if, as we believe, the ultimate definition and expression of the powers conferred by the Statutes is integrative rather than disruptive, in that it takes, for example, the form suggested in the previous section, it will be possible to conclude that the Population Institute has been successfully launched.

As to the validity of the above position, we can only add that events over the next six to twelve months, regarding, in particular, appointment of remaining Population Council contract personnel and population training within departments of the University of Nairobi as described above and in our specific recommendations, will rapidly demonstrate the accuracy or inaccuracy of our perception. Monitoring of events over this period should provide, therefore, a definitive basis for judging the viability of the Institute. This is not to suggest that the Population Institute will reach its final stage of development in the next year, but only that certain things must happen in this period if there is to be any reasonable prospect of long-term success.

In light of the extraordinary difficulties associated with the establishment of a new institution, it would be premature and unfair to recommend against extension of the program. Yet it would be equally unfair not to hold the University of Nairobi and the Population Institute responsible for the application of the knowledge and experience gained over the last year. If applied strenuously and conscientiously by all concerned parties, we believe this knowledge and experience will ensure the success of the Population Institute in a reasonable period of time.

VII. RECOMMENDATIONS

It is recommended:

General

- 1 ... that if substantial progress is made in the realization of basic program objectives in the coming year (Sept., 1978 - August, 1979), said progress to be measured primarily by the parameters suggested in the following recommendations, that AID extend the life of the project for an additional 12 to 18 months beyond the original five-year period to enable completion of all project objectives which might otherwise not be achieved due to past delays in project implementation.

Recruitment

- 2 ... that the two remaining Population Council contract posts to be filled as soon as possible. More specifically, that final appointments to both of these posts be made not later than January 1, 1979. (It is recognized that one or both appointees may not be able to begin their appointments until later in the year, and perhaps not until September of 1979).
- 3 ... that in the recruitment of remaining contract personnel, the Population Council work closely with the Appointments Committee and the Vice Chancellor, and that the Population Council present to the Appointments Committee for discussion complete documentation of the search procedure as well as detailed analysis of its final recommendation and/or ranking of candidates.
- 4 ... that consistent with current University of Nairobi procedures, as determined by the Committee on Nominations, the remaining appointments (contract as well as Kenyan) be made directly to the Population Institute.
- 5 ... that consideration be given to the possibility that visiting scholars on sabbatical leave from their home universities might fill on a temporary basis three locally funded but currently vacant positions in the Population Institute.

Local Training

- 6 ... that the Population Institute initiate immediately a continuing dialogue with the various departments, and most especially with the Departments of Economics, Geography and Sociology, to identify courses within existing departmental curricula which might be strengthened, expanded or even added with the collaboration and assistance of Institute staff.
- 7 ... that the various departments, and most especially the departments of Economics, Geography and Sociology, welcome and encourage the initiative of Population Institute staff in attempting to identify courses within existing departmental curricula which might be strengthened, expanded or even added with the collaboration and assistance of Institute staff.
- 8 ... that the teaching function of the Population Institute may best be expressed at the present time in existing departmental population courses or programs in the Social Sciences, and that this may be accomplished most productively if specific Population Institute personnel teach first in the departments corresponding most closely to the non-demographic components of their training. Moreover, this relationship should not be limited to collaboration in teaching, but should involve as well a dialogue between the Institute member and his departmental colleagues regarding research activities and other matters pertaining to the discipline.

External Training

- 9 ... that future nominations for external population-related study reflect fuller consultation among nominators, nominees and staff members of the PSRL, and that the Board of the Institute act vigorously to monitor this process and guarantee its efficient implementation.
- 10 ... that in as many cases as possible, those candidates selected by the Board of the Institute for external study leading to the Ph.D. degree be assured, prior to departure, of their reappointment in their department of origin, or their reappointment or initial appointment in the Population Institute upon completion of the external phase of their graduate work.
- 11 ... that at least six Kenyan candidates for external training at the Ph.D. level be engaged in their course of study by 31 January, 1979.

- 12 ... that the Population Institute continue its intensive search for a qualified nominee for external training in the area of Family Planning and Maternal and Child Health, and in the area of Economics.
- 13 ... that the need to request additional funds to permit flexibility in overseas training (particularly during dissertation research and defense of the completed dissertation) be considered immediately by the Institute and discussed with USAID.

Research

- 14 ... that future research grant awards of the Population Institute be made by the Board only after the fullest possible consultation and discussion, and that every effort be made to balance the distribution of awards in such a way that population research capacity is strengthened on a University-wide basis.

Relations with Ministries

- 15 ... that the Ministry of Finance and Planning convene a meeting of relevant Ministries to discuss bilateral and multilateral relations between and among Ministries in their utilization of the research and training capacity of the Population Institute. Said meeting to begin with a presentation of the history, present status and prospective status of the Population Institute by the Director of the Institute.

Internal Organization and Administration

- 16 ... that the Director of the Population Institute, in order to reduce the anxieties and misunderstandings which inevitably arise in the absence of adequate information, seek to increase the awareness of all persons and groups in the University of Nairobi of the Institute's activities, plans and aspirations.
- 17 ... that the Director of the Population Institute encourage greater participation, consultation and collegueship in the day-to-day functioning of the Institute and in the deliberations of the Board.
- 18 ... that during this formative period, the Director play a more active role in the day-to-day activities of the Population Institute.

- 19 ... that the administrative assistance available to the Director in his management of Institute affairs be significantly improved.
- 20 ... that to govern more effectively, the Board of the Population Institute meet more frequently than is required under the new statutes.
- 21 ... that to maintain the highest possible level of consultation and collegueship, the staff of the Population Institute meet more frequently than is required under the new Statutes.

Reaction to and Analysis of Evaluation Report

- 22 ... that the Vice Chancellor meet with the Director and professional staff of the Population Institute to discuss the nature and implications of the evaluation report, and its recommendations.
- 23 ... that the Vice Chancellor convene a meeting of the Board of the Population Institute to discuss the nature and implications of the evaluation report, and its recommendations.
- 24 ... that the Vice Chancellor and the professional staff of the Institute meet with representatives of AID/Kenya to discuss the evaluation report and its recommendations.
- 25 ... that the Vice Chancellor and the professional staff of the Institute meet with representatives of the Population Council to discuss the evaluation report and its recommendations.

Other

- 26 ... that plans for a semi-annual Population Institute Journal be abandoned, on the grounds that it would overlap significantly with the existing journal of the Population Association of Africa (Jimlar Mutane); a journal edited by the Institute's Director.

Final Recommendation

- 27 ... HARAMBEE!

Current and Original Program Schedule. Annotated Chronology.
(through August, 1978)

<u>Event Programmed</u>	<u>Anticipated Timing</u>	<u>Current Status</u>
ProAg signed	<u>1976</u> June 30	June 30
PSRC Governing Council established	July	No longer applies
PSRC Director appointed	July	July, 1977
Up to 2 short-term participants selected for training	August	Not yet
Associate researchers from departments begin work on PSRC- sponsored activities	September	Not yet
Limited research and compilation of data from many sources begins	September	November, 1977
Technical Assistance contract signed by AID/W and contractor	September	March 28, 1977
Commodity procurement initiated	October	September, 1977
Team leader on site	<u>1977</u> January	September, 1977
First PSRC senior staff participant begins training	January	Not yet (anticipated September, 1977)
PSRC Research and Training Board established	February	September, 1977
Remaining contract team members on site	July	Not yet
Bulk of PSRC senior staff participants begin training	August	Not yet
Adequate rental facilities available for self-contained PSRC research and training activities	August	June, 1977
Vehicles provided by GOK	August	March, 1978

Appendix (cont.)

<u>Event Programmed</u>	<u>Anticipated Timing</u>	<u>Current Status</u>
	<u>1977</u> (cont.)	
Commodities arrive	August	December, 1977
Degree courses begin	September	Not yet
Significant research efforts mounted	October	November, 1977
Seminars for civil servants begin	<u>1978</u> February	Initiation of planning Jan., 1978
Early research results published and disseminated	May	January, 1978

List of Persons Interviewed.

USAID/Kenya

Louis Gardella: Population Officer
Louanne Douris: Assistant Program Officer
Kevin O'Donnell: General Development Officer

Population Council

Barnett F. Baron: Deputy Director, International Programs
Roushdi A. Henin: Professor, PSRI, and Population Council Representative
in Eastern Africa
David F. Sly: Formerly Professor, PSRI

Population Studies and Research Institute

Simeon Ominde: Director
J. Muinde: Lecturer

Other University of Nairobi

D. Odhiambo (Deputy Vice Chancellor)
P. M. Mbithi (Chairman, Dept. of Sociology)
P. Walji (Dept. of Sociology)
N. T. Kibua (Dept. of Economics)
R. B. Ogendo (Dean, Faculty of Arts)
W. G. Mathu (Institute of African Studies)
W. M. Senga (Director, Institute of Development Studies)
F. F. Ojany (Chairman, Dept of Geography)
F. Wareru (Registrar's Office)
R. Musyoki (Institute of Development Studies)
J. Bennett (Chairman, Dept. of Community Health)

Ministries

J. Kitende (Ministry of Finance and Planning, Rural Planning Division)
E. Krystall (Ministry of Finance and Planning, Rural Planning Division)
S. Kanani (Ministry of Health, Director, National Family Welfare Center)
P. Singh (Director, Central Bureau of Statistics)
F. Otete (Ministry of Health, Deputy Director, National Family Welfare Center)
M. Stiernborg (National Family Welfare Center)
R. Peterson (National Family Welfare Center)
J. A. Mwaniki (Central Bureau of Statistics)
J. Kekovole (Central Bureau of Statistics)

Appendix (cont.)

Other

Roger Young: Program Officer, Social Sciences and Human Resources,
IDRC/East & Central Africa

Edgar Winans: Program Advisor, Social Sciences, the Ford Foundation

David Court: Representative, the Rockefeller Foundation, East Africa

Population Seminars for National,
Provincial and District Planners
and Community Leaders

(Prepared for the Ministry of Health by the Population Studies and Research Institute, University of Nairobi and the Rural Services Coordination and Training Unit, Ministry of Finance and Planning).

Background and justification:

In 1967 the Government of Kenya stated its policy on improving the quality of life of mothers and children through improved maternal child health care and the spacing of births. Beginning in 1972 efforts in this direction were accelerated with the assistance of a number of international and bilateral agencies.

Much of the health infrastructure for the improved delivery of MCH/FP services has been built up over the past five years. 400 service delivery points have been established to provide full time services; additional training facilities for all levels of medical and paramedical staff have been added; a new cadre of Family Health Field Educators has been established; the information and education service has been improved and the research and evaluation sections strengthened.

An important task that remains is to develop an understanding of the importance of population factors in economic and social planning and development in the wide range of policy makers, planners and other opinion leaders whose assistance is of vital importance in motivating the public to utilise these services. These audiences, which include policy makers and planners at the national level, planners at the provincial, district, and divisional levels, community leaders at all levels and the network of 20,000 extension workers who are in contact with the people, must have a thorough understanding of population concepts so that they can utilise these concepts in their work.

The provision of improved health care and family planning services is not only the concern of health personnel. It must involve all who provide services to the general public and can provide information and create awareness of the benefits of a healthy, well spaced family to the nation, community and individual.

In addition to the audiences enumerated above specialized audiences must have a more thorough understanding of the applicability of population concepts for their work. These include Provincial Planning Officers and District Development Officers who will be provided with more intensive courses, and those concerned with nomadic populations.

Long Range Objectives

1. To develop an understanding of population concepts as they are related to social and economic planning and development, in policy makers and planners at national to community levels.
2. To assist these policy makers and planners to effectively utilize their increased understanding and awareness in their daily activities and also to involve them in informing and motivating communities families and individuals with whom they are in contact about the benefits of improved maternal and child health care and the spacing of births.

11 Immediate Objectives

1. To identify the population concepts to be conveyed and the most effective media and channels for conveying them.
2. To prepare educational materials and audio-visual aids illustrating these concepts for different levels of understanding.
3. To develop a general format for a series of seminars on the use of population concepts and data for social and economic planning and development.
4. To develop specialized courses for specific audiences such as P.P.O's and D.D.O's, officials dealing with nomadic peoples, etc.

5. To conduct seminars at the provincial level on the use of population concepts and data for social and economic planning.
6. To convene a seminar at the national level to inform national policy makers and planners of recommendations proposed at the provincial levels and to prepare a national plan of action to promote awareness of and provide information on population issues.
7. To assist participants in provincial seminars in planning, and conducting seminars at the district, division, location and sub-location levels.

Seminar Contents

Population data is of basic importance to economic and social planners. Planners need not be expert demographers, but they should have a sufficient knowledge of the uses and limitations of demographic data and concepts so that they can be effectively utilized in the planning process. Economic and social planners should be able to define clearly what they need, and understand what is potentially obtainable. Only then can they make the greatest use of the demographic data at their disposal, and receive the maximum assistance from professional demographic institutions such as the Institute.

In one way or another, nearly all aspects of rural development are related to population size, composition and spatial distribution. At the district level, planners are concerned with such matters as demand for education (school age population), health services, food, nutritional needs (total population and its composition by age and sex), agricultural production, demand and supply of labour (working population and participation rates), maternal and child health care (women in reproductive ages, expected number of births, children under 5 years), etc. In addition to helping planners determine the quantity of amenities needed such as these, demographic data can also be useful to help planners make locational decisions, determine the levels of inputs needed to achieve given qualitative standards and in

situations of tight resources, they may even be useful to help determine the relative costs and benefits of initiating one programme over another.

Equally important is a clear understanding of the inter-relationship between demographic, economic and social factors. How does population size, and/or age structure affect development, i.e. consumption, production and capital formation? In turn, how does development affect the demographic components of change, i.e. fertility, mortality and migration?

The seminars will last for three days. Therefore, it will not be possible to discuss all these issues in detail. Rather, the purpose of the seminars will be to create an awareness among planners of the need to use and understand demographic data and concepts effectively in the planning process. In other words, their purpose will be to pave the way for more intensive seminars, where the measurement of demographic variables, the preparation of population projections and their application in the planning process are thoroughly discussed.

The seminars will open with a general overview of rural development and the provision of services to rural families. Particular attention will be paid to the structure of health services including maternal and child health and family planning. This will be followed by a discussion of the role that population size, structure and growth play in economic and social development. Next will follow specific discussions of population dynamics in Kenya (using data from the 1962 Population Census, the 1969 Population Census as well as recent data collected through the Baseline Survey and the National Demographic Surveys) and their specific implications to Kenya's programme for economic and social development. Emphasis will be given to the interrelation between demographic, economic and social factors.

The above topics will lead to a general discussion of how to use population projections at the district level for the plan period, and how to use the projections in planning social services (health, education, housing, etc.), land use,

agricultural production and employment by economic sector etc.

Finally, the important subject of the need to initiate population policies (affecting fertility, mortality, internal migration and urbanisation) as tools for development will be outlined.

Each session will be followed by a discussion. Such discussions will throw light on the following:

- a) how best to plan the subsequent and more specialised seminars.
- b) the kind of population data available at both province and district levels.
- c) the degree to which this data is currently being used.
- d) what problems are encountered in using the available data.

These suggestions are tentative, the programme and format for the presentations and discussion will be developed by a working group who will construct the final time-table. Emphasis in the seminars will be placed on fully involving the participants through group work and discussions.

WORK PLAN

a) Provincial Seminars

The first set of seminars are in the nature of getting personnel involved in economic and social planning as well as delivering services to the people together with opinion leaders, to be more aware of the importance of the population component in economic and social development and planning. District Medical Officers will be invited.

b) National Seminar

It is expected that a number of recommendations by the participants will come out from each of these seminars. These recommendations will provide the main material for a second seminar in Nairobi at the national level. Three from each province will be

invited to this seminar and they will be joined by senior persons from the relevant ministries (Finance and Planning, Agriculture, Health, Co-operatives).

c) Specialised Seminars for P.P.O's and D.D.O.'s

Economic and Social planning at the district level has been assuming increasing importance in recent years. One of the main reasons for this, is to insure equity between different parts of the country with regard, for example, social services. By October 1978 a manual (with exercises) on the application of population data to economic and social planning at the district level will have been completed by the Population Studies and Research Institute. This manual will be the focus of 4 seminars covering all districts and will be attended by the Provincial Planning Officers and the District Development Officers.

d) District Planning Seminars

The district representatives will have been subjected to a thorough training on the relation between population and economic and social development, and the use of the Manual on the application of population data in economic and social planning. They will then carry and communicate their experience and knowledge to district officials dealing with economic and social planning as well as community and opinion leaders, at individual district seminars.

e) Specialised Seminar for planning for nomadic populations

Very little is known about population dynamics amongst nomadic population not only in Kenya but also in other African countries. (For example, they are characterised by low fertility and high mortality). Further, problems of economic development for these populations require different approaches from those prescribed to settled agricultural communities. It is therefore recommended that a seminar is undertaken for districts primarily inhabited by nomadic populations. The

nature of this seminar will be different from those listed above, in that they will be in the nature of identifying problems of development and coming up with a set of recommendations on development strategies for these populations.

Time-table

<u>Activity</u>	<u>Place</u>	<u>Time</u>
1. Appoint Working Group	Nairobi	Nov. 1977
2. W/shop to develop concepts & format	"	Jan. 1978
3. W/shop to develop materials	"	Feb. 1978
4. Central Provincial Seminar	Nyeri	Mar-Apr. 1978
5. R/Valley Provincial Seminar	Nakuru	April-May 1978
6. Western Provincial Seminar	Kakamega	May 1978
7. Nyanza Provincial Seminar	Kisumu	June 1978
8. Eastern Provincial Seminar	Embu	June 1978
9. Coast/N.E. Provincial Seminar	Mombasa	July 1978
10. Provincial reps. Meeting and National (28)	Nairobi	Aug. 1978
11. 4 P.P.O. and D.D.O. Seminars	Nairobi	Sept. 1978
	Kisumu	Oct. 1978
	Nyeri	Nov. 1978
	Mombasa	Dec. 1978
12. Seminar in Nomadic population	Mombasa	Feb. 1979
13. 41 Districts' Seminar	Districts	March 1979 (continuing)

Budget

a) Provincial Seminar

Each seminar will last for three days and will be attended by 25 participants on the average from province headquarters and districts in province. There will be six seminars (or 7?). An estimate of the cost follows:
(Duration 3 days)

Ministry
AID 64,000
64,000

8

<u>Item</u>	<u>KES</u>
Preparatory work	30,000
Resource persons (2)	1,000
per diem 132 x 3 x 200/	198,000
Transport 180 x 100/	18,000
Stationery and other supplies	5,000
Rental facilities in 6 centres	3,600
Secretarial services (6 man weeks)	3,000
Contingencies (approx. 10%)	16,400

Total 185,000 \$ 24,000

b) National Seminar
(Duration 4 days)

<u>Item</u>	<u>KES</u>
per diem 30 x 4 x 200/	24,000
Transport 30 x 100/	3,000
Stationery	6,000
Rental facilities	1,500
Secretarial assistance	3,000
Contingencies (approx. 10%)	4,000

Total 41,000 75,000

c) D.D.O.'s Specialised Seminars

<u>Item</u>	<u>KES.</u>
per diem 50 x 7 x 200/	70,000
Transport 41 x 100/	4,100
Stationery and other supplies	5,000
Rental facilities	3,000
Secretarial assistance	3,000
Contingencies	7,500

Total 92,600 11,500

d) District Planning Seminars

41 Seminars @ 16,000 KES. each

656,000 21,000
-65,000 3,000

e) Seminar on planning for nomads

40,000 5,000

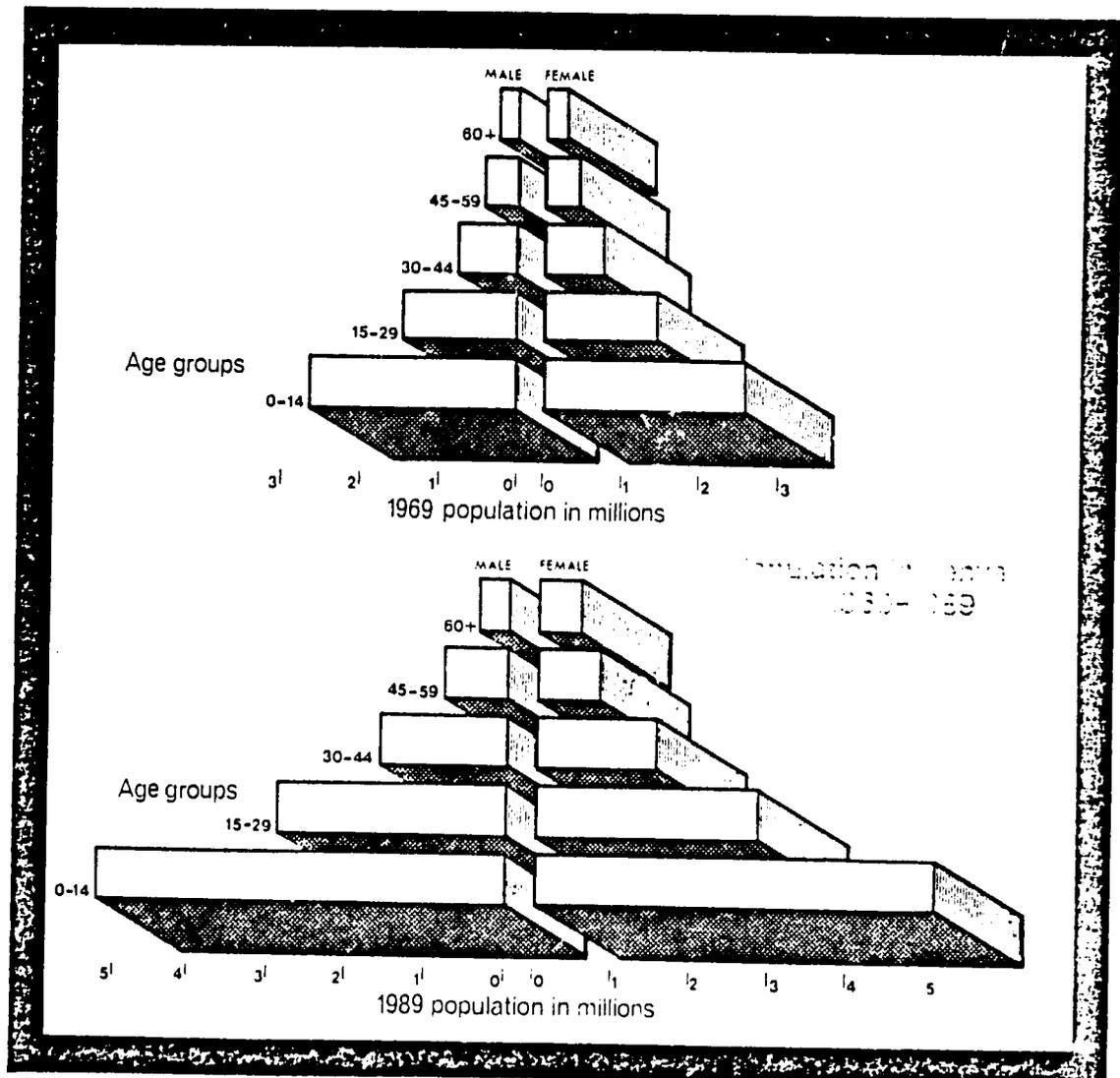
GRAND TOTAL 401,000

412,000 52,000
1014,000



Population, development and economic planning

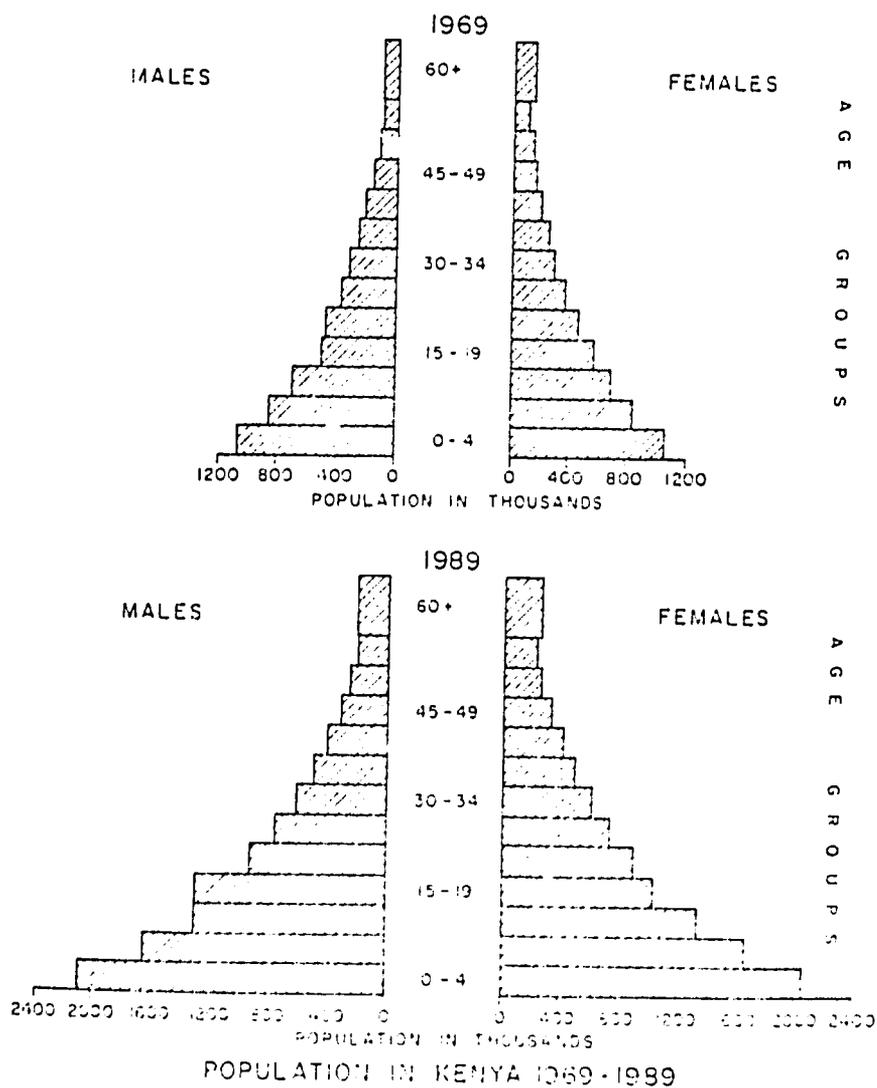
for provincial planner's seminars



POPULATION DEVELOPMENT AND ECONOMIC PLANNING

PREPARED FOR:
PROVINCIAL PLANNER'S SEMINARS

BY:
THE POPULATION STUDIES AND RESEARCH CENTRE
UNIVERSITY OF NAIROBI



PREFACE

This booklet has been prepared for the purpose of giving planners at the province level an introduction to the dynamics of population change, the interrelation between demographic, economic and social factors as well as the application of demographic data to economic and social planning.

A detailed manual on the last topic for use by district development officers is under active preparation.

One important result of this exercise is the technique of population projections devised by the writer to take into consideration inter-province migration in Kenya and the published data by the Central Bureau of Statistics.

A detailed description of the technique used for projections will appear as a technical appendix to the population projections for the period 1969-1989 for provinces, districts and the nation which will be available soon.

These projections will give the population of each province in 5 year age groups by sex, the school population, aged 6-12 and 13-16 by sex, the labour force by sex, the females in the reproductive ages and the expected number of births, for each of the years indicated. Similar data will appear for each district for the fourth plan period. In this booklet data for Nyanza province and its districts are given as an example.

It needs to be added that no new assumptions about fertility and mortality trends have been used in these projections. This latter question is indeed important and a second set of population projections taking these possible trends into consideration is under construction.

Roushdi A. Menin.
Visiting Professor of Demography.
Population Studies and Research
Center,
University of Nairobi.

The writer is grateful to Professor David Sly for comments and alterations which he suggested.

BEST AVAILABLE DOCUMENT

LIST OF CONTENTS

- PART I INTRODUCTION
- PART II DYNAMICS OF POPULATION CHANGE
- PART III INTERRELATIONS BETWEEN MODERNIZATION, ECONOMIC
DEVELOPMENT AND DEMOGRAPHIC FACTORS.
- PART IV POPULATION AND DEVELOPMENT PLANNING
- PART V PROVINCE POPULATION PROFILE
- APPENDICES

PART I

INTRODUCTION

1.1. The United Nations, 1974 World Population Conference held in Bucharest adopted a World Population Plan of Action that asserted: "Population and development are interrelated: population variables influence development and are also influenced by them." The Plan therefore recommended that "population measures and programs should be integrated into comprehensive social and economic plans and programs and this integration should be reflected in the goals, instrumentalities and organizations for planning within the countries."

1.2. The World Population Plan of Action expresses what has become a growing, international awareness - that because population and development are interactive, population considerations must act upon development planning. Recent conferences and reports have addressed themselves to this need to integrate population into development planning. Much of the earlier literature on development planning, though valuable in itself, gave little attention to population growth.

1.3. The decade of the 1960s was marked by a widespread proliferation of development plans. Previously, many governments planned no more than two years ahead for fiscal budgets, and somewhat longer for investment projects. The five-year plan became popular because it is a more integrated and comprehensive approach to development planning, it fulfills a need for a longer-range fiscal plan of public investment, it is often a prerequisite for foreign aid, and it has effective national and international publicity value. Individual development plans vary widely in objectives, programs, comprehensiveness, detail, types of change proposed, and degrees of private and foreign involvement. Each plan reflects the social and economic system for which it was designed and the nature and extent of changes desired by Governments.

1.4. Many serious questions have been raised concerning the extent to which development plans address themselves to the "real obstacles" to development. The degree of implementation, the inconsistent objectives, the emphasis on fiscal budgets rather than on structural changes, and the role of unilateral agencies in encouraging the plans also have been debated.

Although these questions are not discussed here, the reader must keep them in mind in order to understand the role of population in this planning framework.

1.5. In recent years integrated regional planning has been assuming increasing importance to social and economic planners. As a result central statistical offices have come under pressure to provide population data at the district level, where district development plans had to be produced.

1.6. In one way or another, nearly all aspects of rural development are related to population size, composition and spatial distribution. At the district level planners are concerned with such matters as demand for education (school age population), health services, food, nutritional needs (total population and its composition by age and sex), agricultural production, demand and supply of labour (working population and participation rates), maternal and child health care (women in reproductive ages; expected number of births and children under 5 years), etc. In addition to helping planners determine the quantity of amenities needed, demographic data can also be useful to help planners make locational decisions, determine the level of inputs needed to achieve given qualitative standards and in situations of tight resources, they may even be useful to help determine the relative costs and benefits of initiating one program or another.

1.7. In light of the above it was felt that a manual on the incorporation of population data in social and economic planning was needed. This manual will provide the outline for one set of seminars for district development officers and other personnel engaged in planning at the district level. The manual and the seminars will be fairly specialised and although the intention is not to turn the district planners into demographers, they will be introduced to all the necessary demographic tools and techniques to enable them to scrutinize population data, to estimate demographic variables from available data, to construct population projections and finally to apply these projections, together with other data on housing, agricultural production, education, health, water, etc. to produce and monitor their district development plans.

1.8. It was also felt that personnel who are engaged either directly or indirectly in the planning exercise at the province level needed to be exposed to the importance and interrelation between social, economic, and demographic factors. Another set of seminars have, therefore, been organized for provincial personnel and will precede the specialised district planners seminars.

1.9. The purpose of the two sets of seminars are quite distinct. While the seminars for the district planners will be technically oriented (in that the participants will be apprenticed on the application of demographic data to district planning), the latter will be more oriented to bringing up the interrelationships between social, economic and demographic factors.

1.10. Part II of this book will deal with the dynamics of population change; that is, factors that determine the size, distribution, and growth of a population. However, population is both affected by and affects social and economic development. These interrelations will be discussed in Part II. The last part is devoted to showing the importance of incorporating population data in social and economic planning.

PART II - DYNAMICS OF POPULATION CHANGE

The field of Demography

2.1. Demography is the science of population, and like other sciences, it may be defined narrowly or broadly. When viewed from the narrow perspective one talks about formal demography which is the study of populations as closed systems. That is, like any system, a population may be viewed as being composed of two types of elements: structures and processes. The structural elements of a population are 1) its size (the number of people), 2) its distribution (the arrangement of people in space) and 3) its biological composition (its age and sex structure). The processes which operate within any population system are also three: fertility, mortality and migration. Within this system the structural elements always set limits on the processes, but the processes and their interrelations are what cause change in the structural elements of the population systems. Thus, formal demography is primarily concerned with the mathematical relations between structures and processes, and as such all changes can be explained strictly by the elements within the system.

2.2. One simple illustration of this is the basic demographic equation:

$$P_2 = P_1 + B_{1-2} - D_{1-2} \pm M$$

In this equation we are explaining how the population size (P_2) at one point in time can be obtained by knowing the population size at an earlier point in time (P_1), the number of births within the period (B_{1-2}), the number of deaths within the period (D_{1-2}) and the volume of migration ($\pm M$). In short, this equation can fully explain a change in population size. It can also be manipulated to allow us to estimate how much of the change in size can be attributed to anyone of the processes. For instance, births are equal to

$$B_{1-2} = (P_2 - P_1) - (D_{1-2}) \pm M$$

2.3. In a broader sense demography includes additional characteristics of the population such as marital and family status, place of birth, literacy, educational attainment, economic activity, employment status, occupation, industry and income among others. More important, however, is that from the broader perspective populations are treated as open systems and

interest is focused on how demographic structures and processes affect factors external to the population system, and how these, in turn, affect demographic structures and processes. For instance, one may be interested in investigating the way that population growth affects economic development or the impact of economic development on population growth. Similarly, a large number of factors such as the pressure of population upon resources, depopulation, family limitation, urban problems, manpower and the maldistribution of income may be considered from this perspective.

2.4. Some regard the field of demography as consisting of a narrow scope - demographic analysis - and a wider scope - population studies. Demographic analysis is confined to the study of components of population and change. Population studies are concerned not only with population variables but also with relationships between population change and other variables - social, economic, political, biological, genetic, geographical, and the like. The field of population studies is at least as broad in interest as the "determinants and consequences of population trends."

Demographic data and their uses:

2.5. Almost all original demographic data come from censuses (or surveys) or from registration systems. Because of their broad scope and complexity, censuses and vital statistics are typically official; that is, they are produced by governments. Counts of persons are obtained from censuses and sample surveys and counts of events are obtained from registered vital events (births, deaths, marriages, divorces, etc.).

2.6. Censuses and surveys usually enquire about events, e.g. the number of children women have borne in the preceding 12 months. Any of these counts may be shown in the form of multiple classifications, e.g. population by age and sex for certain areas or deaths by age and cause. Various demographic measures, such as percentages, rates and averages may be derived from them.

2.7. The resulting demographic statistics can be used to describe the distribution of the population in space, its density and degree of concentration, its rate of growth, its movements from one area to another, and the forces of fertility, marriage and mortality within it. These demographic statistics have many varied applications. The fields of application include

public health; planning for land use, school, hospital and public utility construction; marketing and manpower analysis, family planning programmes, land settlement, immigration and emigration policies and many others.

2.8. Because demographic trends are important in economic and social life and because of the desire to plan ahead, there is a great demand for estimates of future population. Given a set of assumptions about mortality, fertility and migration over some period, it is fairly straightforward to work out the consequences for population size and age distribution. This form of calculation is called a "projection". An analysis of current demographic levels and past trends is the necessary first step in the calculation of population projections which, in turn, form the underpinning of national, regional or district plans.

Population size

2.9. The size of the population is usually the first demographic fact that a government tries to obtain. The earliest population censuses were often a mere head count. In general, censuses are designed to include the "total population" of an area. There are two types of population counts, the de facto and the de jure. The former comprises all the people actually present in a given area, the latter, all the people who "belong" to a given area at a given time, by virtue of legal residence, usual residence or some similar criterion. In practice however, modern censuses call for one of these ideal types with specified modifications and it is difficult to avoid some mixture of the two approaches.

Population distribution

2.10. For many purposes information on the size and characteristics of the total population of a nation is not sufficient. Population data are needed for political subdivisions and for other classifications of areas (rural and urban) in which people live.

Sex and age composition

2.11. Population is a dynamic concept. Consequently, examination of the composition of a population at any given time should be made, bearing in mind two things: first, a population's composition is the result of past demographic events; and second, its composition establishes the potential capacity for population change in the future.

2.12. The total population is, therefore, classified by sex and age. Apart from its importance for demographic analysis and population projections there is special interest in knowing the absolute and relative number for each sex and age group. All types of planning require data on the sex and age composition of the population. For most practical purposes the distribution of the population in five-year age groups for each sex is sufficient. From these, several "functional" population concepts can be distinguished e.g.:

- (i) The pre-school-age population - population aged 0-4;
- (ii) The school-age population - population aged 5-14;
- (iii) Youth population - population aged 15-24;
- (iv) Working-age population - population aged 15-64;
- (v) Old-age population - population aged 65 and over;
- (vi) Female population in reproductive age - female population aged 15-49.

Components of population growth

2.13. The growth of the population can be measured by comparing the results of two or more population censuses. The components of population change are births, deaths, immigration and emigration - the vital statistics. The algebraic excess of births over deaths is called natural increase; that of immigration over emigration is called net migration. Migration within the boundaries of a country is called internal migration. These components, of course, are measured, not only for the total population but also for subgroups such as sex-age groups.

2.14. Data on the components of population growth are collected through vital registration systems. However, in the majority of developing countries, comprehensive systems of registration for births and deaths are either non-existent or incomplete making it necessary to estimate these components. Data on external migration are even more scanty. However, in most of the countries this component usually does not contribute significantly to population growth so that it may be disregarded. Estimates of fertility and mortality, however, have to be either on the basis of corrected birth and death data or indirectly estimated by analytical methods. The latter make use of either the age distribution of the population which may be obtained from the most recent census, surveys, or from the number of births and deaths reported by households in the census. These estimates are frequently used to adjust the registration data that are

believed to be incomplete.

(a) Measures of mortality

- (i) Death rate - Annual number of deaths per 1,000 persons of total population. Since this can be affected by variations in the population structure it is often referred to as the "crude" death rate.
- (ii) Sex and age-specific death rate - Annual number of deaths per 1,000 persons for a given sex and age group.
- (iii) Life table - A table prepared for each sex separately, which is derived on the basis of age-specific death rates. The basic function in the life table is the probability of dying between one exact age to another exact age, according to existing mortality conditions, per 1,000 persons of the initial exact age. It differs from a mortality or death rate since the latter is calculated per 1,000 persons within the intervening age groups.
- (iv) Expectation of life - An important measure derived as part of the life table. It is the average number of years to be lived according to existing mortality conditions, from a specific age onward. A commonly used measure is the expectation of life at birth. The latter is also considered as a summary index of the existing age-specific death rates.

(b) Measures of fertility

- (i) Birth rate - Annual number of live births per 1,000 persons of the total population. Since this can be affected by variations in the population's age structure it is also often referred to as the "crude" birth rate.
- (ii) Age-specific birth rate - Annual number of births per women in given age groups (usually between 15 and 49 years).
- (iii) Gross reproduction rate - A summary measure calculated on the basis of fertility rates for each age within the reproductive life span e.g., 15-49. It is interpreted as the average number of daughters born alive per woman during her reproductive life according to existing fertility conditions.

(c) Population growth rates

(i) Annual population growth rate - Annual percentage population increase, generally expressed as a compound or exponential rate. It is the net result of the rates of birth, death and migration.

(ii) Annual rate of natural increase - Net result of the birth rate and the death rate.

C. Future projections

2.15. Estimates of various kinds covering some specific time period are essential if quantitative planning is to take place. Bearing in mind the sort of society they want to promote, these projections enable governments to consider the relative merits of alternative decisions, whatever decisions are taken even if negative or neutral, will affect the future size and structure of population.

2.16. Strictly speaking, a projection is simply a statistical extrapolation; that is, the consequence of extending into the future the mathematical function which is thought to describe best the trend of past data. Its validity, therefore, depends upon its basic premises. It shows what the expected course of events would be if the same conditions that affected the series of data in the past were to prevail in the future. In practice, the word "projection" is now used far less precisely than in its narrow statistical sense of a straightforward extrapolation. It often includes arbitrary modifications in the trend resulting from changes in the assumptions at particular times. Thus, the trend of past data may show a population increasing at the rate of 2.1 percent per annum. It may be unrealistic to assume that this will continue so the assumption may be changed as the result of other evidence and opinions. For short time periods, however, the assumption that current conditions will continue is likely to hold. Short term projections give an order of magnitude subject only to a relatively small margin of error, and are essential to such administrative action, particularly in budgeting.

Alternative assumptions

2.17. Where we cannot be reasonably sure of either current trends (or those of the recent past) or future trends in the rate of population growth it is clearly necessary to examine a number of alternatives; namely low, medium and high population projections using different assumptions for future fertility and mortality trends.

Accuracy of demographic data

2.18. All planning depends on some method of future estimation but no matter how good the method, the usefulness of the final estimates depends ultimately on the quality of the data used as a base. If the initial data are ambiguous or uncertain, the final estimates may be valueless or, worse, misleading. However, it is not possible politically, nor necessary technically, to postpone action until completely reliable data become available. Though population data, like any other statistical data, should, of course, be as accurate as possible, the degree of accuracy required is relative and a function of the use to which the results are to be put. Even the 1970 Census of the U.S.A., which has one of the most sophisticated census systems in the world, is officially estimated to have been underenumerated by about 2.5 percent. Brief consideration of the administrative difficulties - logistic, financial and human - of recording everyone at the same moment makes it clear that some degree of error is inevitable. As a population is dynamic, a census can do no more than give a snapshot at a particular moment.

2.19. In most developing countries the basic data are of varying degrees of reliability. Let us assume that in one of these countries the official figures for the total population were 20 million in 1950 and 30 million in 1970 giving an average annual growth rate of 2.05 percent. Let us further suppose that the range of error was plus or minus 20 percent in 1950, but that as the quality of census taking had improved the range had lessened to plus or minus 10 percent in 1970.

We would then have the following:

	<u>1950</u>	<u>1970</u>	<u>Rate of Growth 1950-70</u>
	(millions)	(millions)	(percent per annum compound)
Maximum	24	33	1.61
Official	20	30	2.05
Minimum	16	27	2.65

2.20. This uncertainty is inevitable in nearly all developing countries, and makes it unsafe to put much reliance on past trends as a guide to the future. All that can be done is to cross-check the data from any other available sources and then to select those totals and rates of growth which seem to have been the most likely. Nevertheless, an element of doubt must persist.

Population Pyramids

2.21. The age and sex distribution of a population is often illustrated by a "population pyramid". This is constructed by age group showing males on the left and females on the right.

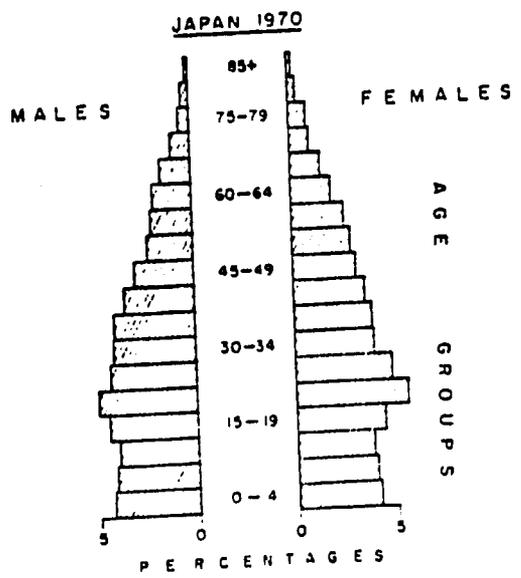
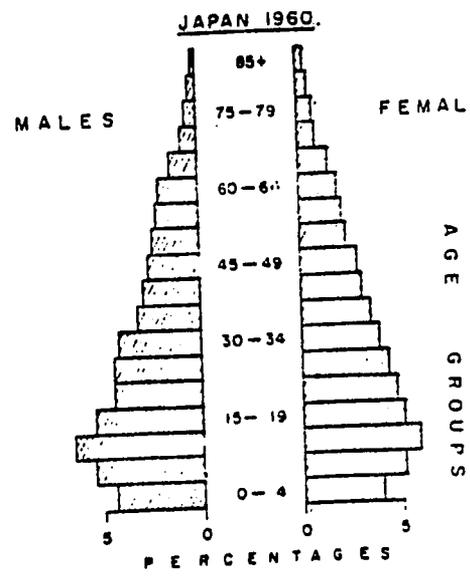
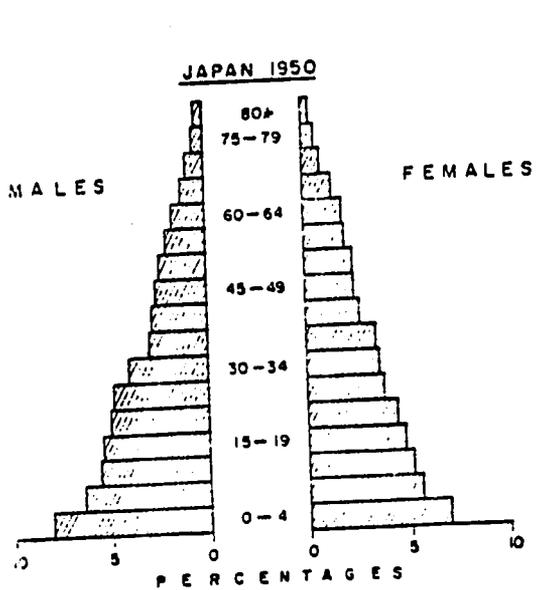
2.22. If a demographer wants to show how a number of populations differ in age and sex composition (without regard to the size of the total population), he can make this comparison most clearly by constructing pyramids based on proportions. When proportions are used, the areas of all the pyramids are the same. The pyramids differ in shape, but their areas are identical. These differences in shape are apparent to the eye when the pyramids are placed side by side, but they are much more striking when one pyramid is superimposed on another.

2.23. Whether absolute numbers or percents are used in a pyramid, it is conventional to record age on the vertical axis and to measure the numbers or percents of the population at each age along the horizontal axis, with males to the left of the vertical line and females to the right. The pyramid is nothing more than two bar graphs placed on their sides and put back to back. The vertical center line represents zero, and when the pyramid is based on percents, the sum of the length of all the bars (including both the male and the female sides) is always the same: 100.

2.24. A population is always changing, whereas a pyramid is a static picture. The proportions of people in the various age and sex categories change because of the continuous action of mortality, fertility, and migration. The population pyramid freezes this

motion at a particular moment in time. From a slightly different perspective, the pyramid can be viewed as a picture of the biological history of a population.

2.25. Japan is an example of a population which has experienced pronounced changes in its birth and death rates in the last 25 years. Figure 1 shows the proportion of the Japanese population in five year age-sex groups in 1950, 1960, and 1970.

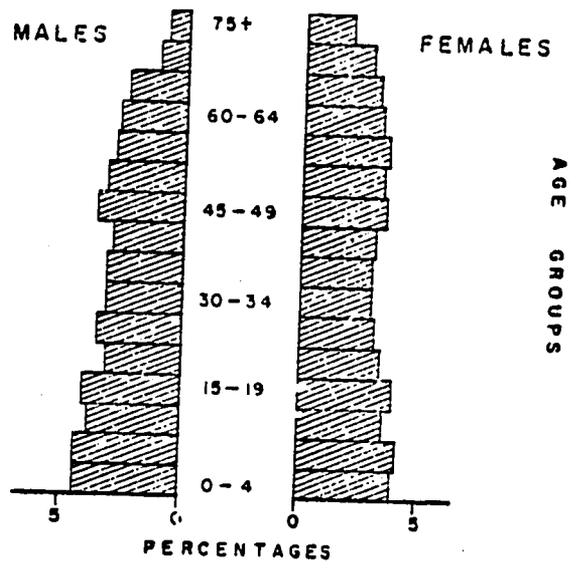


2.26. The greater increase in the number of babies born in the immediate post-war period can be seen in the pyramid for 1950. It appears again in 10-14 age group - in 1960 and 20-24 age group in 1970. Subsequently, the birth rate obviously declined in the fifties and stabilized in the sixties.

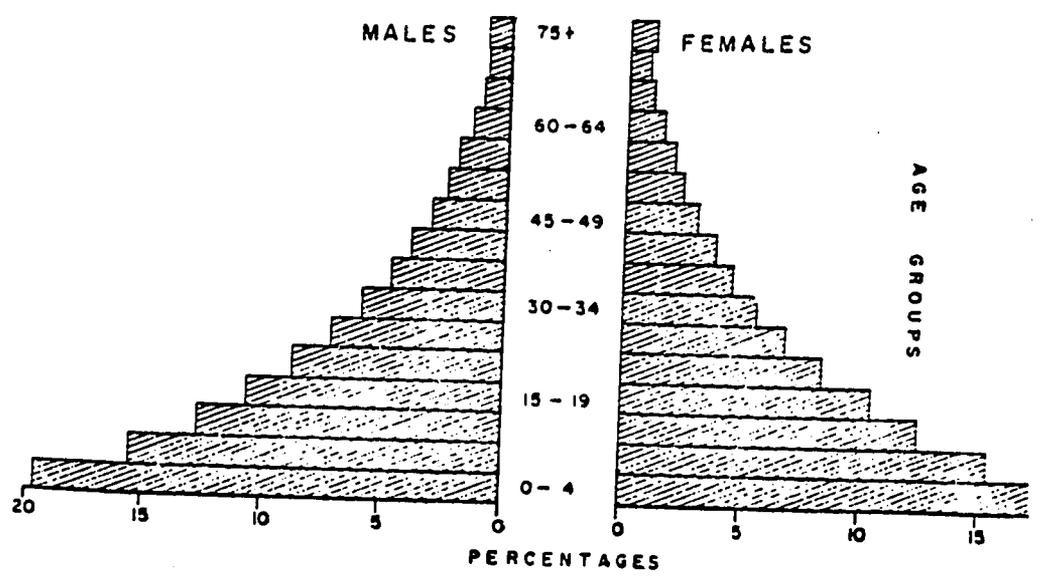
2.27. Whenever birth rates fall from some previous level, children constitute a smaller proportion of the total population. As a result, the population may have a comparatively small base, possibly even smaller than that of the older age groups. A rise in the birth rates has the opposite effect on the age pyramid, the proportion of people in the younger age groups increasing and the pyramid assuming a broader appearance at the base.

2.28. A population with high birth and death rates is represented by a pyramid which has a broad base reflecting its high fertility, and relatively large steps between successively older age groups reflecting its high mortality. Conversely, a population with low fertility and low mortality is characterised by a ~~NARROW~~ based pyramid and small steps between successive age groups. An example of the former is given by Kenya (1969) and for the latter by the U.K. in 1970. These are shown in Figure 2.

UNITED KINGDOM



KENYA



Migration into an area exerts a different influence on composition. Since migrants are usually in the young adult ages they enlarge the proportions in the intermediate ages and the proportions in the other ages are reduced accordingly. The subsequent effects of migration on growth are transmitted downward along the age scale through the reproduction of migrants and upward along the age scale as a result of the aging of migrants. Migration also alters sex composition. Males and females are seldom attracted to a given place, in equal proportions. For the most part, long-distance migration weights the balance in favour of males, whereas short-distance migration adds a larger number of females than of males to the receiving population.

Fertility, Mortality, and the Age Distribution

2.29. If one deals with a closed population (namely, one in which gains or losses by migration are negligible), the shape of the age distribution, that is, the percentage in each age group, is determined jointly by the courses of fertility and mortality. However, their impact, is not equal. The principal determinant of the shape of the age distribution is fertility. The reason their effects are so distinct lies in the different incidence of deaths and births by age. The effects of fertility and mortality do not enter the age structure at the same place. Births of any particular year add to the number of infants and to no other age group. A higher birth rate in that year, unless accompanied by a rise of the death rate for infants, results in a larger percentage of infants in the population than before. A lower birth rate leads in the opposite direction - toward a smaller percentage of infants.

2.30. The effects of mortality, on the other hand, are spread through all ages. Everyone, is the same age at the time of birth, but afterwards people may die at any time of life. If the general level of mortality rises or falls, the age structure is not altered unless mortality is affected in greater degree at some ages than at others. A change of mortality must itself be unequally distributed by age if it is to have an uneven effect on the age composition of the population.

2.31. As a matter of fact, changes in mortality actually are unequal by age. But the ordinary pattern of death rates by age is so strong that it still prevails over the kinds of change so far observed. Even in countries of relatively low mortality, where there is a greater degree of control over the major causes of death, death rates by age still follow the shape of the familiar U-curve.¹ Death rates among infants have remained many times higher than death rates in, let us say, later childhood, and the high mortality in older age groups, though steadily reduced by modern-medicine, has little effect on the age structure because few people survive to be affected.

The age distribution, labour supply and dependency ratio

2.32. The "dependency" ratio is based on the fact that every member of a society is a consumer but that only some members are producers. A country with a larger proportion of its population producing goods and services is economically better off than a country with a smaller proportion of producers - other things being equal. Unfortunately, other things are not equal, and there is no internationally uniform basis on which various countries decide who may be economically productive and who may not. Societies differ with respect to the parts of their populations which are expected to be economically active.²

¹General mortality risks have a differential effect, especially as among age categories. The very young and the very old are acutely susceptible to their influence, while the ages from roughly 10 to 40 years are to some degree resistant. This is what produces a U-shaped curve for mortality.

²Data on the economic activity of persons are collected through population censuses or surveys. (The other source of such data are the more specialized labour force surveys.) The manpower of a nation is the totality of persons who could produce such goods and services if there were a demand for their labour and they desired to participate in such activity. The economically active population (sometimes also called the working force) is that part of the manpower which actually engages, or attempts to engage, in the production of economic goods and services. At a given time an economically active person may be either employed or unemployed. The term economically active population can be considered as a general term which includes the labour force concept. The essence of both terms involves the carrying out of an activity from which the person derives, or attempts to derive, pay or profit so that all persons engaged in nonremunerative work, such as housewives, are excluded unless they qualify as "family workers."

In some societies small children are expected to be members of the labour force; in others school attendance is required of young men and women until they are in their late teens. In some societies, the aged are required to work, and in still others, they are denied the opportunity to be economically active.

2.33. For purposes of international comparison we shall call those under 15 the dependent youth and those over 65 the dependent aged. The age group 15-64 will be considered the economically active part of the population and are the base for the calculation in column 9 of table 1.

The dependency ratio is calculated as follows:-

Population aged 0-14 + population aged 65 and over

Population aged 15-64

Dependency and Economic Development

2.34. The problem of economic development in developing countries is related in several ways to age composition. There is a real irony in Table 1; the countries which are trying to increase their production and their level of living are those burdened with the highest dependency ratios. The countries with the lowest dependency ratios are already highly urban and industrial and have the highest levels of living. The poor countries have high fertility, which creates a heavy dependency load. This makes it difficult for such countries to improve their living conditions.

2.35. Those countries that can afford dependents the least have the most dependents, and those countries that can afford to support a good many dependents, have the fewest. A sudden drop in fertility would quickly reduce the total dependency ratios in developing countries because the number of dependent young would decrease, while the number of people over 15 years of age would be unaffected for 15 years, i.e. until the time when those born in the year when the birth rate went down began moving into the 15-year-old age group.

On the other hand, if a country with a high birth rate were to lower its death rate sharply, it would experience an immediate and sizable increase in its dependency ratio, because the lives saved would be primarily those in the youngest age groups. The effect would be nearly the same as a large increase in the birth rate.

Region or Country	Population Total Mid-1977 (Millions) ²	Birth Rate	Death Rate	Rate of Natural Increase (Annual percent)	No. of yrs. to double population	Population Projection to 2000 (Millions)	Infant Mortality Rate	Population under 15 years. (%)	Dependency ratio (%)	Pop. over 64 yrs. (%)	Life Expectancy at birth (years)	Per capita G.N.P. (U.S.\$)
WORLD	4,083	30	12	1.8	38	6,182	103	36	72.4	6	59	1,530
AFRICA	432	45	19	2.6	27	811	154	44	88.7	3	46	400
NORTHERN AFRICA	100	42	14	2.8	25	185	130	44	88.7	3	53	570
WESTERN AFRICA	125	49	23	2.6	27	243	175	45	92.3	3	42	300
EASTERN AFRICA	120	46	19	2.7	26	239	151	44	88.7	3	45	320
ETHIOPIA	25.4	43	18	2.5	28	53.8	181	44	88.7	3	42	100
KENYA	14.4	49	16	3.3	21	31.5	119	46	96.1	3	50	220
SOMALIA	3.4	47	22	2.6	27	6.5	177	45	88.7	2	41	100
TANZANIA	16.0	47	22	2.5	28	33.1	162	47	96.1	2	44	170
UGANDA	12.4	43	16	2.7	26	24.7	160	44	88.7	3	50	250
ZAMBIA	5.2	50	19	3.1	22	11.3	160	46	96.1	3	46	540
NORTH AMERICA	240	15	9	0.6	116	294	16	26	56.3	10	72	7,020
LATIN AMERICA	336	36	9	2.7	26	608	78	42	85.2	4	62	6,030
ASIA	2,325	32	12	2.0	35	3,504	116	38	72.4	4	56	530
EUROPE	478	15	10	0.4	173	539	22	24	56.3	12	71	4,000
NORTHERN EUROPE	82	13	11	0.2	347	90	14	24	58.7	13	72	4,590
NORWAY	4.0	14	10	0.4	173	4.5	11	24	61.3	14	74	6,540
SWEDEN	8.2	13	11	0.2	347	9.2	8	21	56.3	15	75	7,800
UNITED KINGDOM	56.0	12	12	0.1	693	61.9	16	24	61.3	14	72	3,840
WESTERN EUROPE	152	12	11	0.1	693	109	15	23	56.3	13	71	6,150
AUSTRIA	7.5	12	13	0.0	-	8.1	21	24	63.0	15	71	4,720
BELGIUM	9.9	12	12	0.0	-	10.7	16	23	58.7	14	71	6,070
FRANCE	53.4	14	11	0.4	173	61.7	12	24	61.3	14	72	5,760
GERMANY (F.R.)	61.2	10	12	-0.2	-	65.5	20	22	56.3	14	71	6,610
NETHERLANDS	13.0	13	8	0.5	132	16.1	11	26	58.7	11	74	5,590
EASTERN EUROPE	108	18	11	0.7	99	122	26	23	51.5	11	70	2,800
BULGARIA	8.8	17	10	0.6	116	9.9	23	22	49.3	11	71	2,040
CZECHOSLOVAKIA	15.0	20	12	0.8	87	16.9	21	23	53.8	12	71	3,710
GERMANY (D.R.)	16.7	11	14	-0.4	-	17.7	16	22	61.3	16	71	4,230
HUNGARY	10.7	18	12	0.6	116	11.1	33	20	47.1	12	70	2,480
POLAND	34.7	19	9	1.0	69	40.2	25	24	42.3	9	70	2,910
ROMANIA	21.7	20	9	1.1	63	25.9	35	25	51.5	9	69	1,300
SOUTHERN EUROPE	136	17	9	0.8	87	153	26	26	56.3	10	71	2,470
USSR	259	18	9	0.9	77	314	28	26	53.8	9	69	2,620
OCEANIA	22	22	9	1.3	53	32	55	32	63.0	7	67	4,490

Unhappily from a demographic and economic point of view, many developing countries have seen their death rates drop very fast in a relatively short time, while their birth rates have remained high. This process has increased the dependency load in the very countries which can least afford an increase in the parts of their populations that consume but do not produce, or produce very little.

2.36. A high dependency ratio is the result of a large proportion under 15, which in turn is the result of high birth rates. A glance at Table 1 makes that very clear.

2.37. The dependency ratio varies from 88.7 for Africa (where the proportion of the population under 15 years is 44 and the crude birth rate is 45) to 56.3 in Europe (where the proportion under 15 is only 24 and the birth rate is only 15). This means that while in Africa 100 persons in the working age groups support 88 dependents, in Europe 100 persons in the working age groups support only 56 dependents. The implications of this situation for consumption, capital formation and productivity is clear. A working force that supports few dependents has higher capacity for saving which is transformed to capital. And a society that has high investment potential is in turn a high productivity (per person) society.

2.38. Further the higher the productivity the higher is the income. And communities with high incomes have high potential for saving (and investment i.e. capital formation).

2.39. A final word about variations in dependency ratios in East Africa. The two countries with the highest dependency ratios are Kenya and Zambia, on account of their highest birth rates in that region.

2.40. Before moving to Part III, it is useful to look at the following Table 1, which shows, amongst other information, the levels of fertility, mortality, and growth for selected regions and countries of the world.

2.41. While the crude birth rate is 30 for the world, it is 45 for Africa (that is 50 percent higher than the world average.) Africa is followed by Latin America where the birth rate is 36 and Asia where it is 32 per thousand. Europe and North America come at the bottom of the scale with a crude birth rate of 15 per thousand. In other words Africa's birth rate is three times higher than that of Europe or North America.

2.42. Within Africa, the crude birth rate varies from 43 for West Africa to 46 for East Africa and 42 for North Africa. Within East Africa, Kenya (49) comes next only to Zambia (50), and is followed by Tanzania and Somalia (47).

2.43. With regard to mortality, the average crude death rate for the world is 12 per thousand, compared with 19 for Africa (or about 60 percent higher than the world average.) The crude death rate drops to between 9 and 11 for Latin America and Europe. Within East Africa the rate is highest (22) for Tanzania and Somalia, but lowest (16) for Kenya and Uganda.

2.44 Within Europe, there is little difference either with regard to the birth rates or the death rates. The difference between the crude birth rates and the crude death rates are reflected in the crude rates of natural increase. For the world as a whole the rate is 1.8 percent as compared with 2.6 percent for the whole of Africa. Within Africa, the rate of natural increase is highest for Kenya (3.3 percent). In fact Kenya's rate is the highest in the world as can be seen from the table.

2.45. Africa has a rate of natural increase almost equal to Latin America (2.6 and 2.7 percent respectively.) This equality despite the lower birth rate in Latin America compared with Africa is on account of the much lower death rate in Latin America.

2.46. The balance between births and deaths in Europe and North America is very small varying between minus 0.2 and 0.4 percent for the two Germanies, to zero for Austria and Belgium to less than 0.5 percent for the majority of countries in both East and West Europe to a maximum of 1.0 and 1.15 for Poland and Rumania.

2.47. An interesting phenomenon is the rate of natural increase in Latin America, which is estimated at 2.7 percent, fairly high by international standards. While the birth rate has recently started to decline, the death rates in that continent dropped drastically. In this respect Latin America is battling with the demographic gap (the bulge created by the steep drop in mortality while the birth rate is falling very gradually). Africa is in an earlier stage of the demographic transition where mortality is in the process of declining while the birth rates are still maintained at a very high level (not preceded anywhere in the world.) With more declines in mortality in Africa the demographic gap will even be larger. There is no reason why the death rate in Africa should not decline to 9 per thousand (similar to Latin America). If the birth rate is maintained at 45 per thousand, the

rate of natural increase would rise to 3.6 percent and the population of the continent would double every 18 years. In many ways Kenya represents what is likely to happen in the continent in the not too distant future. While this country has the highest crude birth rate in East Africa, it has the lowest crude death rate giving the highest rate of natural increase in the region: (See the section on the demographic transition and its applicability to African countries.)

2.48. The higher the rate of natural increase the shorter the period during which a country's population would double itself. While the population of the two Germanies is declining, that of Belgium and Austria have zero rates of growth, the population of the world needs 38 years to double itself that of Western Europe requires about 700 years to double itself as compared with 27 years for Africa and only 21 years for Kenya.

2.49. So far we have dealt with the dynamics of population change and have shown how fertility, mortality and the age distribution are closely related. This interrelation has its implications for economic development and to economic planning. These aspects are the subject matter of Part III and IV of this booklet.

PART III - Interrelations Between Modernization, Economic
Development and Demographic Factors

INTRODUCTION

3.1. In the preceding part of this manual we have examined some of the dimensions of population change giving particular emphasis to the interrelation between age structure, fertility and mortality. This discussion has shown how young populations (those with a large percent of their total in young age groups) get caught in a growth trap with many young people having children who in turn, grow up to become parents of their own children. Early reductions in mortality usually are concentrated in the very young ages with the result that more children live to have children of their own. Thus, even with no increases in the number of children born to each woman (the fertility rate) the absolute number of children being born increases because the number of women to have children increases.

3.2. These are the kinds of lessons which formal demography teaches us. As implied in our definition of population studies, however, birth rates and death rates are affected by a large number of natural, social economic, political and psychological factors. It is unfortunate, but true, that scientists who have studied the interrelation between these types of factors and population growth have not developed the precise theories which formal demographers have. Indeed, if we had such theories the planning process would be much easier than what it is.

3.3. In the absence of precise theory about the effects of modernization on population growth about the best that we can do is draw on the historical experience of places which have modernized and see how this has affected their demographic processes and rate of growth. We use the term modernization here to emphasize that a broad view of change is needed; like demographic change, economic development never takes place in a vacuum. Changes in the structure of an economy are interrelated with changes in the structure of the family, the organization of daily life, communications, politics and even how we think and make decisions as well as a whole host of other things. In this part of the manual we will focus on how some factors such as these influence population growth. After this general context has been discussed we will look at the more specific question of the effects of demographic change on economic growth.

(a) The effects of Modernization on Population Growth

3.4. Modernization affects population growth through one or more of the three determinants of population growth - namely births, deaths, and migration. Migration is an important cause of economic growth will not be discussed, because international migration seems unlikely to have an important effect on the future growth of the population of the developing countries.

3.5. The classical economic theory of population growth (primarily associated with Malthus) held that any rise in incomes (particularly among the poorer classes) tended to increase birth rates and (with more certainty and force) decrease death rates.

3.6. The course of events since Malthus' time, however, has led to the gradual evolution of a theory that postulates a more complicated sequence of birth and death rates associated with Modernization. It is sometimes termed the theory of the "demographic transition." According to this theory an agrarian peasant society (characterized by a high degree of self-sufficiency within each community and even each family, by relatively unimportant role of market exchange) typically has high average death rates. Moreover, these death rates usually fluctuate as consequence of variations in crops, the varying incidence of epidemics, etc. In such society birth rates are nearly stable at a high level. Death rates are high as a consequence of poor diets, primitive sanitation, and the absence of effective preventive and curative medical practices. High birth rates result from social beliefs and customs that necessarily grow up if a high death-rate community is to continue in existence. These beliefs and customs are reinforced by the economic advantages to a peasant family of larger numbers of births. The burden of child care rests primarily on women in a peasant society, and the place of women is typically subordinate.

Children contribute at an early age to agrarian production and are the traditional source of security in the old age of parents. The prevalent high death rates, especially in infancy, imply that such security can be attained only when many children are born.

3.7. In other words, an agrarian low-income society, before it undergoes modernization, has a mortality and fertility pattern that fits pretty closely the conditions which Malthus thought, at least in the first edition of his famous essay, to be a universal tendency: high birth and high death rates. Population growth is slow.

3.5. Modernization, according to the theory of demographic transition, has the effect of bringing about a reduction in death rates. Modernization evolves from a predominantly agrarian peasant society to a society with a greater division of labor, using more elaborate tools and equipment, becoming more urbanized, more oriented to the market sale of its products, and characterized by rapid and pervasive changes in technique. It also involves improvements in transportation, communications, and productivity, and these improvements have the effect (notably in Europe, the United States, Canada, Australia and New Zealand, and later in Japan) of bringing a striking reduction in death rates. The reduction in death rates may be ascribed partly to greater regularity in food supplies, to the establishment of greater law and order, and to other fairly direct consequences of social and economic change. Other factors contributing to the decline - improvements in sanitation, the development of vaccines and other means of preventive medicine, and great and rapid strides in the treatment of disease - also occur. Advances in medical knowledge can occur more readily in a secularized, less tradition-bound society that has resources available to support medical research. The means to build and the will to accept sanitary water supplies, sewage systems, and the like are more likely to exist in an industrial than in an agrarian society. For similar reasons, only in society with such characteristics as a high degree of division of labor and high levels of productivity, are there the means to construct large numbers of hospitals, to educate and train large numbers of doctors, and the like. It is often hard to determine in a given historical period whether general conditions or specific medical advances had the greater effect. In Europe even before 1300 there had been significant medical discoveries (including vaccination for smallpox) that must have made some contribution to declining mortality. Nevertheless, the Population Division of the United Nations suggests that the

reduction of mortality rates in the European cultural sphere in the eighteenth and the first part of the nineteenth centuries was due mostly to more or less direct effects of social-economic improvement, while in the latter part of the nineteenth and especially in the twentieth centuries the more direct factors have been improving medical knowledge and increasingly effective public health methods.¹

3.9. The theory of demographic transition asserts that high birth rates and death rates, characteristic of an agrarian low-income society, are also affected by modernization. The changing structure of production, with a declining importance of the family as a production unit, the growth of impersonal systems for the allocation of jobs, and the development of economic roles for women outside of the home, tend to increase the possibility of social and economic mobility that can better be achieved with small families. The economic advantages of a large family are decreased. Another feature of modernization is increasing urbanization. Children become more of an economic and social burden in an urban setting than a rural. The whole process of change, moreover, weakens the force of traditional customs and beliefs. In most countries that have undergone the transition from an agrarian to an industrialized, market-oriented society, the custom of the small family has started in urban areas at the higher end of the socio-economic scale and has spread to smaller cities, lower-income groups, and eventually to rural areas.²

3.10. Just as the early decline in the death rate in the European cultural area preceded the development of modern medical innovations the early decline in fertility preceded the development of modern techniques of birth control. In many areas a marked decline in fertility has depended only on techniques of co-contraception known in many societies for centuries. However, both the extent and effectiveness of family limitation in industrialized countries has been facilitated by the development and manufacture of efficient contraceptive devices.

United Nations, Department of Social Affairs, Population Division. The Determinants and Consequences of Population Trends, Population Studies No. 47, New York, United Nations, 1953, pp. 66-67.

2
See F.W. Hootstein, "Economic Problems of Population Change," in Proceedings of the Eighth International Conference of Agricultural Economists, London, Oxford University Press, 1953.

3.11. Although the processes described by this theory can apparently be traced in every region where the society has been subject to transformation from an agrarian to a specialized market-dominated society, the theory is not sufficiently quantitative and specific to tell how far and how fast the vital rates generally decline. It does, however, contain one further significant generalization, which is that the decline in the birth rate typically occurs after a substantial time lag, in comparison with the decline in mortality. The slower response of the birth rate to social-economic change is attributed to the fact that a fertility decline depends more strongly on the alteration of long-established customs and institutions. Also, there is, in almost any society, a general consensus in support of the reduction of suffering, illness, and death, while no such consensus supports the desirability of small families and the patterns of sex behaviour required to reduce the birth rate. The historical implications of timing between the decline in the death rate and the decline in the birth rate have been that the countries affected have experienced a substantial and rapid growth in population. Thus, in the period between 1750 and 1950 the "area of European settlement" increased its population sixfold.

3.12. In barest outline the sequence of events, according to the theory of demographic transition, can be summarized as follows: The agrarian low-income society is characterized by high birth and death rates- the birth rates relatively stable, and the death rates fluctuating in response to varying fortunes. Then as the society changes its form to a more interdependent and specialized market-dominated type, the average death rate declines. It continues to decline under the impact of better organization and improving medical knowledge and care. Somewhat later the birth rate begins to fall. The two rates pursue a more or less parallel downward course with the decline in the birth rate lagging behind. Finally, as further reductions in the death rate become harder to attain, the birth rate again approaches equality with the death rate and a more gradual rate

of growth is reestablished; however, low risks of mortality and small families as the typical pattern.

3.13. The theory of the demographic transition has been summarized here because it is the theory which seems to be the best available to describe the expected course of events in the low-income areas of the world today. Shall we not expect that modernization in the contemporary low-income areas will bring with it a decline in death rates followed by a decline in birth rates which will produce (over an interim period) an acceleration of population growth. A superficial survey of the demographic situation and the apparent prospects in low-income portions of the world gives reason for doubting the applicability of the demographic transition as an exact description of the likely course of events in these areas. The principal reason for doubting the precise applicability of the theory as to death rates is that it appears feasible today to reduce death rates markedly without a major reorganization of society. Many low-income areas of the world today - for example, Ceylon, Malaya, some of the Caribbean islands, and much of Latin America - have without abandoning their present agrarian structures, so reduced their death rates while birth rates have remained essentially unchanged.

3.14. In other words, substantial social-economic improvement may be a sufficient condition for a decline in mortality, but it is not today a necessary condition. The factors primarily responsible for the mortality declines in these areas are innovations in public health. These make possible drastic reductions in mortality at low cost, and in the absence of wholesale social reorganization.

3.15. Mortality declines have recently become widespread and precipitous through the combined effects of:

1. The development of antibiotics and insecticides.
2. The evolution of effective public health organizations in low-income areas.
3. The invention of suitable low-cost methods of sanitation.

Experience in communication, persuasion, and leadership as well as in the more direct medical aspects of public health in rural areas is accumulating rapidly. To doubt the lessons learned will make future public health work more ineffective.

3.16. Mortality experience in situations where modernization began in the eighteenth or nineteenth centuries is possibly misleading on two scores as a guide to the likely course of death rates in areas with current low incomes. First, the death rate in many low-income areas either is already, or may soon be, going down more rapidly than it ever did in countries now enjoying high incomes, and second, the rapid drop in death rates can occur with or without pronounced changes in social and economic structure.

Whether the pattern of fertility decline that has been observed in the industrializing areas of European settlement will be duplicated in the low-income areas of today is very uncertain. The situation in Africa differs from that of Europe in two main respects. One of these differences, is the level of the birth rate reached in Africa and thus, the rate of population growth. The second is the social and economic circumstances which accompanied the European demographic revolution.

3.17. If we ignore East Europe and European overseas settlements where the crude birth rates were relatively high, the level of fertility never exceeded 40 per thousand, and certainly did not reach the levels prevailing in many parts of Africa at the present time.

Table 2 - Summary of birth rates in Africa

Number of persons (million)	Percent of total	Crude birth rate (Per 1000)
106.6	39.6	54.4
124.0	45.1	45.1
34.9	13.0	42.4
3.4	1.3	37.3

Source: Summary of Table 2 in R.A. Henin, "On the Applicability of the Theory of Demographic Transition to African Countries", in the Demographic Transition in Tropical Africa: Proceedings of An Expert Group Meeting, Paris, 17th - 19th November, 1970 (mimeo).

3.18. As can be seen from the above table, 40 percent of the population covered (107 million persons) had an average crude birth rate of about 54.4 per thousand. The rates range from 50 for the Sudan to 62 for Guinea.

R. A. Henin, *Op. Cit.*

Another 46 percent had a crude birth rate of about 45 per thousand, 14 percent of the population under consideration had a crude birth rate of 42.4 per thousand. Finally only 1.3 percent of the population being considered had a crude birth rate of about 37 per thousand which was equal to the highest rate recorded for England and Wales, Sweden and Norway.

3.19. The African picture with regard to the level of fertility points out two important deviations from the course of events in Europe. First, the level is certainly very much higher and indicates the long way which lies ahead for the African countries to reach the present fertility levels prevailing in Europe. The second important deviation lies in the fertility differences between African countries, and more important still between regions within countries. The question arising from these differentials for fertility trends—whether fertility in the foreseeable future is likely to decline remain constant or rise. To answer this question one needs to study fertility differentials.

3.20. During the 1966 First Population Conference at Ibadan, Ansley Coale¹ presented a fertility map which gave estimates of fertility at the province level for most countries in Tropical Africa. In three of the countries covered by the map (Nigeria, the Niger and Sudan), differences between the lowest and the highest crude birth rates were for the various provinces in the order of 25 per thousand. Four other countries showed differences varying between 15 and 18 per thousand. In six other countries, differences ranged between 5 and 14 per thousand.

3.21. It must however, be remembered, that part of the differences between these provincial birth rates may be due to difference in the quality of reporting. What is immediately important for our purpose is that fertility differentials within many countries do exist, and the question arises as to how far these differences are the result of deliberate birth

J.C. Callwell and S. Okonjo, Eds. The Population of Tropical Africa. Longmans, 1968, pp. 180-181.

control or due to factors which are not the result of deliberate action. If the latter is the case, the removal of these factors, other things remaining equal - would result in the low fertility regions fertility rising to that prevailing in other parts of the country.

3.22. Little is known, however, of the reasons for these differences in fertility either between or within countries. Various factors such as differences in age at marriage and in proportions marrying have been suggested.¹ Such differences, however, could only play a rather minor role in bringing about the observed differences since available information show that in most countries most women are married by age 20.

3.23. Another factor that has usually been suggested is the prevalence of polygamy in African marriages.² Lower fertility on this count might arise from the lower average frequency of coitus for women in polygamous marriages. Favouritism, which means that some wives may be preferred to others may also result in a number of wives being deprived of sexual relations.

3.24. Other factors which may be important are frequency of divorce and early widowhood, the latter results from excessively high mortality in certain regions of Africa. Further reduction may result from prolonged separation when husbands migrate in search of employment.³ Prolonged lactation which has the effect of lengthening the interval between pregnancies has also been cited as a common practice in parts of Africa.⁴

1
Population Bulletin of the United Nations, No. 7 7-1963 ST/SCA/Ser. N/7, New York, 1965, pp. 21-23.

2
Population Bulletin No. 7, op. cit. p. 22.

3
Population Bulletin No. 7, op. cit. p. 22.

4
High infant mortality, resulting from early weaning is another factor behind prolonged lactation. See Frank Lorimer and others op. cit. p. 37.

3.25. Having dealt with fertility levels and possible fertility trends in Africa, some attention will also be given to mortality. The following table gives a summary of the differing mortality levels prevailing in countries for which data on mortality are available.

Table 3 - Summary for Death rates in Africa

Number of persons (millions)	Percent of Total	Crude Death rates (1000)
18.8	7.2-	37.0
21.2	8.1-	32.0
38.9	15.0-	26.2
165.8	53.7-	22.1
15.6	6.0	19.0

Source: R.A. Henin op. cit.

3.26. Fertility levels and trends in Africa have little similarity with those in Europe between 1700 and 1860; this is also true of mortality. The death rate in Britain took about 170 years to drop from 35 to 20 per thousand. In the developing countries of Africa, inexpensive and simple application of drugs has brought about declines in the death rate. The sharp emergence of the demographic gap has already appeared in many countries whose expenditures for health are relatively limited. In many areas the introduction of even the rudiments of sanitation, vaccination and insecticides, can save thousands of lives.

3.27. There are little data available on the trend of vital rates in Africa. However, the average crude death rate for the continent was estimated for the period 1960-66 at 23 per 1000,¹ as compared with 19 per 1000 in 1977.

3.28. This difference may throw light on mortality trends in Africa. These trends are confirmed by differentials in mortality as shown from the above table. To sum up the study of fertility and mortality differentials prevailing at present in Africa, it can generally be said that the former signifies a possible rise in fertility while the latter indicates a downward trend in mortality.

¹ Population Prospects in Africa. United Nations Economic and Social Council, Economic Commission for Africa E/CA. 14/PC 17th April, 1969 Seminar on Application of Demographic Data to Development Planning, Addis Ababa, 2nd - 8th June, 1969.

3.29. Attention will now be given to the emergence of the demographic gap in Africa. Carr-Saunders¹, estimated the total population for Africa in 1900 at 120 millions. On the other hand, the United Nations Demographic Yearbook² shows a figure of 164 million in 1930 or an increase of about 33 percent in 30 years. Further, the Economic Commission for Africa gives an estimate for Africa's population in 1960 of 270.9 million (and of 432 million in 1977). When the 1960 figure is compared with that for 1930, it means that Africa's population increased by 115 million or about 70 percent in the thirty year period between 1930 and 1960 as compared with only 37 percent in the previous 30 years, (between 1900 and 1930.) Further the following average annual rates of population growth are given by the Economic Commission for Africa.³

<u>1960-65</u>	<u>1965-70</u>	<u>1970-75</u>	<u>1975-80</u>
2.3	2.4	2.6	2.7

3.30. How much of the rise in the growth rate in the period under consideration, that is since 1900 to the present, is due to drop in mortality, and how much is due to a rise in fertility is not known and certainly needs investigation. However, it is the belief of the present writers that the above growth rates do not give a true picture of the demographic factors at work in Africa. It is doubtful whether the above projected growth rates take the possibility of a rise in fertility into consideration. Apart

¹
Carr-Saunders, World Population, Oxford 1936, Figure 6, p. 42.

²
United Nations Demographic Yearbook, 1966

³
Population Prospects in Africa, op. cit., Table 3.

from situations where changes in modes of life and improvements in economic conditions which are conducive in certain circumstances to a rise in fertility, improvements in health conditions not only lead to a drop in mortality but also to a rise in fertility. For example, while it is relatively easy to use insecticides to eradicate malaria,¹ and apply antibiotics to reduce the incidence of venereal disease, these results may actually increase fertility.

3.31. To sum up, a growth rate of at least 3 percent² for Africa as a whole is not impossible. This compares with about 1.5 percent for England and Wales around 1880. Herein lies the difference between the European and the African demographic revolution. Nor is it feasible that the economic and social atmosphere which led to the closure of the demographic cycle in Europe will be duplicated in Africa. This continent will need to discover its own solution to the closure of its demographic gap.

1

"Malaria may lead to interruption of pregnancy and abortions which may be in part explained by the various types of anaemia that it causes and in part by the well-known predilection of malaria parasites and particularly of *P. falciparum* of the placenta. Here it would be logical to assume that malaria may to some extent, reduce the number of live births by reducing the number of conceptions and causing interruption in pregnancy. E.J. Bampana "Effect of Malaria Control on births and death rates" Proceeding of the 1954 World Population Conference, Rome Meetings No. 4 and p.497-506.

2

According to U.N. estimates, "Africa's rate of growth is next only to that of Latin America and South Asia (2.3 percent yearly for the period of 1965-70); the same estimates show that Africa would have the highest rate of population growth (3.0 percent) by the period 1980-85. These indications of rapid growth coupled with the prevailing pattern of land use and the scarcity of funds for exploiting the other natural resources of the continent call for a systematic examination of the present demographic situation." The Demographic Situation in Africa, Economic Commission for Africa, African Population Conference, Accra, Ghana, 9-16, December, 1971. E/CA 14/POP/44, p.1.

(b) The Effect of Demographic Change on Economic Growth

3.32. There are three aspects that need to be looked at when considering the effect of the demographic situation in a country on its economic development. The latter can mean different things to different people. To some it means that families can consume more. To others it means that the national economy saves and invests more from its annual gross national product. To still others, more capital per worker, so that output per worker is increased, is the essence of economic development. It is not necessary to decide which of these many views is the more correct, for all these manifestations of economic development are associated with higher output per head of the population. The three aspects referred to above are (a) the population size, (b) its growth rate and (c) the age distribution.

3.33. One of the most stubborn tendencies in popular thought about population is to refer to countries or regions as overpopulated or underpopulated. Elementary logic suggests that there must then also be a state in which the population has just the right size i.e. optimum population size. In the present state of affairs nothing is easier than to show how impossible it is to argue that density alone is a major factor in determining economic prosperity. No matter how it is measured, density is high and low in countries that are poor and rich, without the slightest systematic tendency.

3.34. It is quite plausible that in very sparsely settled countries, a larger population would be better able to avail itself of its natural resources. There would be economies of scale, the division of labour would be facilitated by greater density of settlement, transportation costs would be smaller etc. Beyond a certain point, there might be diminishing returns. The advantages of a larger population would vanish. For the time being, if the "optimum" population seems larger than the actual one, it is easy to believe that population growth does not constitute a problem. The central flaw in this argument is that it is vague on the role of technological change and capital formation, which will displace the point of 'optimum' population even while the actual population is moving towards it.

If there is any relationship at all between the rate of population change and the rate of capital formation and technological change, then the fastest way of raising incomes per head is not necessarily to increase population. In some conditions it certainly may be, and there may be reason to encourage immigration, but the whole argument breaks down if population growth competes with capital formation.

3.35. Older population thought was not growth conscious, its concern since Malthus and before was with the size of population. By and large, however, size seems to be of subordinate importance. Neither the present nor the future size of population constitutes a major economic problem. The real problem is the excessive rate of growth which impedes the process of modernization.

3.36. This takes us to the second factor that may be considered in analysing the effect of demographic factors on economic development, namely the rate of population growth.

3.37. Most developing countries have "empty" areas, some of them quite large, that are potentially no less productive than already inhabited and exploited areas. Sometimes these areas should be populated and used, and eventually the national population could be several times larger. The real question is - is a doubling of population better in terms of income per head if achieved by 1990 or 2000? It is the rate of population increase that is important. A country can only consume and invest what it produces - apart from international loans and grants. Its GNP is a measure of the output of goods and services produced. The more GNP, the more is available for consumption and investment.

3.38. A country's GNP depends on (a) how much labour, capital and natural resources ("land") it employs in production and (b) how effectively it uses them. More invested capital, for instance, ordinarily means more output. An improved technology, i.e. the introduction of improved methods of production, means that the same quantity of capital (or labour or land) will produce more output.

3.39. The availability of goods and services per person in a country cannot increase unless GNP is increasing faster than population. If GNP can only increase by say 4 percent a year, population growth would have to be held to 1 percent a year to give a 3 percent real increase in annual per capita income.

3.40. Suppose a nation's population is doubling every 25 years. This means that the labour force is also doubling every 25 years. Doubling the labour force, however, will not itself double GNP unless the stock of capital and employed natural resources also double. A gross savings rate (ignoring depreciation deductions), of at least 5 percent is probably needed to double the stock of capital in 25 years. As for land, in some countries there simply is not twice as much land of equal productive worth available (considering location values as well as physical yields). Finally, because of "land" or natural resource limitations, the stock of capital must grow more rapidly than the labour force if output is to double in the absence of improved technological innovations.¹

3.41. Most of the developing countries are engaged in a "race" with population on one side and capital stock and improved technology on the other. If the population grows too rapidly (with some more employed labour,) GNP will increase at about the same rate, leaving income per capita at about the same level. If capital investment and technological innovation are "forced" beyond a certain rate of increase, higher per capita income, depends on a lower rate of population growth, productivity and therefore output per head, will tend to increase.

3.42. There is a well known formula that relates growth in per capita income to population growth and to the percentage of net domestic product that is invested annually. It is net investment that is relevant in this context.

Fortunately, there typically are technological advantages so that doubling factors of production may produce more than twice as much GNP. Increased productivity due to technological innovations is very hard to measure, but it probably varies from between 1.0 percent and 2.0 percent in most developing countries. (Thus, even if a nation had no change in labour, capital or land employment it would double its GNP in 35 to 70 years because of technology alone.)

It is instructive to observe what estimates of the growth in per capita income are given by the formula under various assumed conditions.

$$\text{The formula is: } a_t = a_0 (1 + \frac{a}{100} - p)^t$$

Where a_t = per capita income in year t ,

a_0 = per capita income at base year;

a = annual net investment as a proportion of net domestic product;

b = ratio of cost of marginal increment of capital to the annual value of its output;

p = rate of population growth;

The formula assumes that the value of (a) and (b) will be constant. A plausible ratio of the cost of the marginal increment of capital to the annual value of its output in an industrially developed country is about 4 to 1, but whether this ratio is likely to be higher or lower in developing countries is a point about which there has been considerable discussion.

3.43. It is claimed that developing countries tend to be more efficient in making consumer goods than in making capital goods; and this tends to raise the ratio. Also tending to raise the ratio is the fact that machines and equipment are less well maintained in developing countries, hence depreciation rates are higher. On the other hand, the ratio, which will vary in different sectors of the economy, is likely to be relatively low in agriculture. Since agriculture is predominant in developing countries, this tends to lower the overall ratio. All in all, a ratio of 3 to 1, is perhaps an optimistic guess, but will nevertheless be used in the following exercise to show the effect of different rates of population growth, on per capita income.

3.44. Keeping the ratio of net capital formation at say 15 percent of the GNP, the following two columns show the different rates of population growth (p) and the number of years (t) required to double the per capita income.

Rate of population growth (p)	Number of years required to double the capita income (t)
1.5	10.3
2.0	23.5
2.5	27.1
3.0	35.0
3.5	47.7

3.45. With a rate of population growth of 1.5 percent per annum and 15 percent of the GNP in the form of net capital formation, a capital output ratio of 3.0, about 20 years are required to double the per capita income.

3.46. Finally, a few words about the importance of the age distribution. We have referred to the demographic gap as the widening spread between fertility and mortality. Its importance for rapid population growth can be shown by the fact that nations continue their natural increase for relatively long periods after fertility rates begin the trend downward to join the low mortality. Until this gap is closed, rapid population increase will continue.

3.47. The demographic gap is a dynamic concept. It should not be regarded as a simple equivalent for natural increase, nor can we assume that it is accurately measured by difference in crude vital rates. Certainly the changing age distribution brought about by the emergence and closure of the demographic gap is a most important component. The demographic gap differs from equilibrium phenomenon in being essentially a long-run phenomenon, "Europe's transition took approximately three hundred years and resulted in something like a seven fold multiplication of the population of European extraction. There is no past transition that involved less than a century and less than a threefold multiplication of population."¹

3.48. An important factor, therefore, which enters in an analysis of the effect of population growth on economic development is the distribution of the population by age (which is itself influenced by the same factors which determine the rate of population growth) as reflected in the dependency ratio. As shown above, assuming a closed population (that is, closed to in or out migration), of the two factors i.e. fertility and mortality it is fertility, which is the principal determinant of the age distribution. Persistent high levels of fertility give a broad based age distribution, while low fertility levels result in a narrow based age distribution.

¹ Coatsworth, Frank W., Summary of the Demographic Background of Problems of Underdeveloped Areas, International Approaches to Problems of Underdeveloped Areas, Milbank Memorial Fund, 1957, p. 11.

3.49. On the other hand, mortality changes of a sort that usually occur have only a slight effect on the age distribution. The implication of this is that a change in the growth rate which is caused by a change in fertility will lead to a large change in the shape of the age distribution, while a change in the growth rate caused primarily by a change in mortality will have a small effect on the shape of the age distribution.

3.50. Another implication is that all low income agrarian areas which are characterized by high birth rates, have - irrespective of their mortality levels - a broad based age distribution. Further, while low birth rates eventually lead to relatively high proportions over 65, yet the decrease in the proportion under 15, which results from the decline in the birth rate, outweighs this increase.

3.51. The fact then is that the burden of dependency, or the ratio of persons who are in a dependent status because of their age (too young or too old to work) to persons in ages making them eligible for productive work is - as mentioned earlier - relatively high in areas characterized by persistent high birth rates, and is low in areas with low birth rates.

3.52. The population of Africa is a young one. On average, in 1970 children under 15 years of age made up 44 percent of the total population. Persons in the working age groups (15-64) formed 53 percent of the total population, while the age (65 years and over) represent 3 percent. With this age distribution Africa has the highest dependency ratio which was about 87. In 1970, it is estimated that the rate will increase to about 92 by 1985.

3.53. Now consider two populations of the same size, one characterized by a history of high birth rates, while the other by low birth rates, the population with high birth rates will have a relatively high dependency ratio (that is a relatively high

It is a common mistake to believe that a fall in infant and child mortality will have the effect of reducing the economic wastage involved in raising children who die before they reach the productive age. If fertility does not fall, the fact that more children survive to become parents as well as workers will actually have the effect of raising the number of children more than the number of workers and thus, if anything, to raise the dependency burden.

percent of the population under 15 and over 65, and a relatively low percent of the population in the working age (i.e. 15-65) as compared with the low birth rates population. With the same resources and capital available, the lower birth rate population should have higher per capita income as a direct result of having a higher fraction of its population in the productive ages.

3.54. Again, take two populations which differ in the history of their birth rates, which are equal now, not in terms of their size, but in terms of the size of the labour force. Under these circumstances the labour force in the high birth rate economy will support substantially larger numbers of children. The situation would affect the availability of capital required for expansion of output in that the average number of consumers implied by the past history of high birth rates would exert a depressing effect on the level of savings. An economy that had been characterized by high birth rates, would tend to have a more rapidly rising number of children, which in turn would tend to divert some of the capital accumulated each year into expenditures such as school and child welfare programs. These expenditures would reduce the availability of capital for directly adding to the productivity of the labour force.

3.55. The three demographic factors identified as basic in an analysis of the effects of population growth on economic development are population size, rate of population growth, and age distribution. Actually of course, these three factors are never independent. A continuation of a more rapid population growth inevitably produces, in a closed population, larger numbers. A slower rate of population growth brought about by a reduction in birth rates inevitably has age distribution effects.

Further analysis of Demographic factors in economic growth

Introduction

3.56. Population is generally recognized as closely associated with economic growth; people act as both producers and consumers. The nature and magnitude of the association between demographic variables and the components of economic growth may be measured in different ways; the most common variable is the level and growth rate of per capita income.

3.57. Although economic growth policies depend on the problems encountered and on the conditions, experiences and priorities of each country, the overall policy of most governments is to increase output. However, in the process, the quality of life has often not received the high priority called for in the International Development Strategy, which states that the goal of development is improvement in the quality of life of the population as a whole and that of every individual. Economic growth should aim at improving the standard of living of the people not only by increasing per capita income but also by assuring adequate and equitable supplies of the commodities and services essential for their well-being. Other objectives such as reducing the disparities of income and living conditions between diverse socio-economic groups and generating job opportunities to reduce unemployment and underemployment should also be given high priority.

3.58. Policies addressing population growth, migration and urbanization, and labour force and employment, for example, are needed when population-related problems reach such a level that the development process may be affected. They will depend on the demographic problems and their contribution to development.

Population, National output, Consumption and Investments.

3.59. The interrelation between population, output, consumption and investment has been partly explained in earlier sections. Output depends on the size and skill of the economically active population and on the level of investment. Investment depends on savings which may be determined to some extent by the abstention of the population from consumption. There is also a close relationship between consumption and output, for example, increases in output and in individual income may induce people to spend more on consumer goods. Besides, increases in income may also influence changes in population such as fertility, mortality and migration patterns, labour force participation and family composition. However, it is helpful to consider separately each demographic factor and to see how it may affect and be affected by the components of economic growth.

Population Size and Sex/Age Composition

3.60. The contribution of population size to economic output is supplying labour to the productive sectors of the development. Also, consumption obviously depends on the size of population. For a given level of output, the higher the population, the greater the demand for consumption and the less for savings and investments. Since the contribution of males, females, children and adults to output and their consumption behaviour are both different, the sex and age composition of a population also influences output and consumption. The interaction between age and savings behaviour is also complex since it may be negative, nil or positive at different stages in the individual's lifetime. In the early and late stages in the life cycle, savings are usually negative, since requirements of individual consumption exceed income. In the stage of life corresponding to the first period of the working age, savings are often nil since there is on average a balance between consumption and income. When the worker gets more experience leading to a substantial increase in salary and when the basic needs of the family are fulfilled, savings become positive.

3.61. The population of working age supplies the labour force with active members contributing as economic producers to the output of the country. Generally speaking, the higher the increase in the economically active population, the greater the potential labour input in the development sector. However, a high rate of population growth may increase the proportion of unemployed in the labour force if development does not supply enough job opportunities. Unemployed workers are not considered economic producers but economic consumers who depend materially and financially on employed persons. The non-working age population and the population of working age which are not economically active constitute the dependent population - economic consumers but not producers. The larger the increase of the dependent population, the higher the volume of consumption and the smaller the remaining savings for investment.

Size and structure of the family:

3.62. Consideration of individuals of each age group as units of consumption and savings may be too simplistic for the existing family structure. Neither children nor married adults are independent from the family in terms of consumption and savings, and exert their influence not in isolation, but through

family size and income. For example, decisions by parents regarding expenditures for children are usually based on their income and other family expenditures. Family size and composition also have a significant effect on savings; usually the larger the family, the higher the consumption and the smaller the savings. However, an extra child in a larger family may increase family expenditure less than in a small family because children may share the same services and facilities.

Nuptiality and fertility

3.63. Change in marital status may affect the structure of consumption and the volume of savings. For example, married couples living on one income will save less, if there is any margin left at all, than bachelors with the same personal income. On the other hand, a higher marriage rate may also require additional government expenditures in housing and other social facilities for families and children. The influence of nuptiality on the national output may be different for males and females. Marriage may oblige men to enter the labour force or to seek extra work if their personal income is not sufficient for the family. Female workers, on the other hand, may drop out of the labour force on marriage to devote themselves to their new family's responsibilities.

3.64. Fertility may influence output either by preventing some women from participating in the labour force or by reducing the productivity of female workers during pregnancy and child care. The influence of fertility on consumption and savings is mainly through the number of dependent children. The impact of income, consumption and savings on fertility is rather complex. Although it has been observed in several countries that low fertility is associated with high income, the influence of income on fertility is closely linked to other social and economic variables, particularly to level of education, economic activity status and occupations of women. Experience shows that fertility declines started in more developed areas where people have a high income and education. With regard to savings, their impact on fertility is unclear, though it is sometimes argued that increased savings may incite parents to have an additional child.

Morbidity and mortality

3.65. High morbidity may affect the volume of output by reducing the productivity of workers. It also requires more government and private expenditure on medical services and facilities. The level and trend of morbidity of the population by sex and age, corresponding to social and economic classes and geographic areas, provide useful indications on the requirement of health services, on capacity for savings and labour quality for each group of population. Similarly, mortality decline increases the labour force. However, higher life expectancy may increase expenditures for retirement facilities and other related social benefits. The feedback effects of economic growth on morbidity and mortality are also generally recognized, for example increase of income, raising of education level and improvement of nutrition and living conditions greatly reduce the rate of morbidity and mortality of the population.

Migration patterns

3.66. Migration patterns, both national and international, may also affect the distribution and structure of income and consumption. Migration may bring additional labour where it is needed for regional development and to some extent reduce unemployment and underemployment in the region of origin. As it happens, however, it also frequently has the opposite effect in region of destination.

3.67. However, migration results in increased government expenditures for housing, education, health services and other social services and facilities relating to human settlements. Besides, since migration is usually selective the regions of origin may be deprived of their younger and most active workers. Economic growth may also influence migration, national as well as international. Generally speaking, a well developed area attracts people, particularly workers, from less developed areas and an economically rich country attracts more foreign migrants from poor neighbouring countries. In other words when the government provides workers with enough job opportunities and adequate wages, the number of people leaving their place or country for jobs is reduced. A geographically balanced distribution of income and development would slow down migration.

Population and Foreign Exchange

3.68. In most countries, it is difficult for the government to produce all the goods needed and the country has to import commodities from other countries to keep up with demand. The larger the population, the higher the demand and the greater the volume of imports. The policy of most developing countries is to increase exports and reduce imports to improve their balance of trade. However, the import of certain commodities, for example machinery, industrial equipment and raw materials that the country is unable to produce, is essential for economic growth. The shortage of foreign exchange may then affect overall national development.

3.69. In developing countries, the main source of foreign exchange is agricultural commodities and local products of the traditional sector. Since most agriculture and traditional production is labour intensive, the production of these exportable products may create job opportunities and may absorb a number of unemployed and underemployed workers. The impact of population change on the volume of exports manifests itself mainly through output, domestic consumption of certain exportable commodities by substituting for them other similar products which are either not exportable or less profitable to export should be encouraged in order to increase the surplus available for exports. However, the excessive promotion of exports without considering the availability of natural and human resources, production capacity and particularly the consumption requirements of the growing population, may create serious shortages of certain essential goods. Foreign exchange policy should be based not only on the balance of payments but also on the welfare of the people.

PART IV

INTRODUCTION

Population and Development Planning

4.1. Although the interaction between population and economic growth is generally recognized among development planners, demographic variables have not been given due attention in national development plans. In most countries, only such general indicators as population size and growth have been

entered into the planning process. The failure to fully incorporate demographic factors in development planning is largely a result of the shortage of reliable data on population and development and the lack of information on the interaction between population change and economic growth. Consequently, significant biases in estimates and projections of development factors and difficulty in achieving social and economic objectives are often caused by unforeseen changes in population characteristics over time. Conscious of the gravity of these problems, the World Population Conference confirmed the importance of regarding population within the overall framework of social and economic development and recommended that the United Nations, its specialized agencies and member states intensify research on social and economic aspects of population change and on the impact of social and economic development policies on demographic behaviour and trends.

4.2. Demographic variables have direct relevance to planning for economic and social development. Population size, sex and age structure, composition by marital status, family size and household size, spatial distribution and extent of urbanization, and both internal and international migration, need to be considered, together with non-demographic variables, in development planning. Rates of and changes in fertility and mortality are of major interest in planning as joint determinants of natural population increase, and as separate factors in certain sectoral fields such as health and education. The structure, composition and distribution of population in a given planning area determine its

its roles as consumers and producers of goods and services, and are of great importance in all programmes involving sections of the population, such as children, youth, working adults, and the retired and elderly. Population movements are important as determinants with natural rates of population change, of population size in planning areas, and for the role of migrants in changes of the potential labour force. Planning cannot take adequate account of demographic variables without reasonably accurate, demographic data.

4.3. National development plans cover various sectors of the economy. The overall target, however, is normally a single figure of annual percentage growth in gross national product. The effect of growth in gross national product on levels of living can be judged only in relation to changes in population numbers. For an understanding of levels of living, and changes in such levels, it is necessary to use per caput indices, the most general being per caput national income. The growth of population and the growth of national product are thus linked inevitably as fundamental determinants of changes in individual and family levels of living. In this basic relationship, population numbers appear as consumers of goods and services. For progress, the rate of economic advance must exceed the rate of population growth, and, if reasonable levels of living in developing countries are to be attained in a reasonable time, the rate of economic development must surpass that of population growth by a considerable margin.

4.4. Man is a producer as well as a consumer. The size and age-sex structure of the population, therefore, play a fundamental role in determining the supply of labour for the production and distribution of goods and services. With the increasing role of scientific and technological factors in production, the total size of labour force may, however, become less critical than an adequate supply of certain highly trained key operatives in managerial and technical positions. More generally the quality of labour may be at least as important as its quantity.

A major current problem of development in developing countries is the lack of adequate employment opportunities for rapidly growing labour forces. Whilst death rates have been falling fairly quickly and can be expected to decline further, birth rates have remained virtually unchanged.

As a consequence very rapid increases are taking place in the labour force of developing countries and will inevitably continue to do so for some decades.

4.5. The net results of migration streams, both international and internal must also be considered in planning, particularly for economic development, since it may be accepted that migration is to a large extent economically motivated. The significance of migration differs greatly, however, among and within countries. Some developed countries, with a net gain from international migration, are able to augment their work force and thus compensate for the slow rate of labour force increase resulting from low birth rates. Some of the smaller developing countries, on the other hand, look towards international migration as an aid in reducing problems of unemployment and underemployment. For the developing countries in particular internal migration, including the growing rate of urbanization, are important considerations in planning. Economic growth in the developing countries demands extensive structural changes in their economies, particularly a shift of population away from the agricultural sector as well as a reorganization of the agricultural sector itself. Planning has to take account not only of the siting of industry and other non-agricultural locations of employment, but also of the quickly growing needs for housing, education, health and other amenities arising from the joint effect of natural population growth and migration.

4.6. Attention is usually focused primarily on average rates of population growth in determining the impact of demographic variables on the development process. Problems may, however, also arise from fluctuations in demographic variables, particularly the birth rate, even in countries where the changes in population numbers have no serious long-term implications. Notable examples are provided by the sharp increases and subsequent partial declines in birth rates in several Western countries following the Second World War. Considerable problems have occurred, particularly in the education sector, as the population "bulges" have moved through the primary, secondary, and tertiary stages of education. Large fluctuations in mortality are now rare except in times of large-scale war or extensive natural disasters. The possibility of such fluctuations arising in the future from large-scale famine cannot be ruled out, if population growth exceeds increases in food supply.

4.7. The intention here is not to produce a manual on the use of demographic data in economic and social planning, which will be the purpose for the specialized seminars for district planners. The following areas namely education, health services and housing are referred to here only for demonstration purposes.

Educational Planning

4.8. Educational planning is increasingly recognized as having fundamental importance in the social advance and economic growth of countries at all stages of development. It is now generally accepted that inputs to education should be regarded not just as consumption but also as providing direct economic benefits. In the developing countries generally low levels of educational attainment and proportionately large populations in the educational age ranges point to the need for planning. The 'young' age structure in developing countries implies that with equal pupil-teacher ratios and equal educational attainment they need a greater number of teachers per thousand population than the developed countries. Projections of attendances at all educational levels are needed particularly in planning teacher training programmes and the construction of schools and colleges.

4.9. Planning is relevant at all stages of the educational pyramid and particular importance must be attached to the inter-relationships between successive stages. Such planning requires data on enrolment at successive stages (and projections over the plan period), taking account of drop out and wastage rates.

4.10. Even though the reliability of projected school age populations must be subject to the accuracy of predicting numbers of births occurring some years ahead, long-term (perspective) planning is desirable in the education sector. Projections of elementary school children can be made for only 5 or 6 years before new births become a factor. Although required buildings can be put up fairly quickly, appreciable additions to teaching staff will normally take a number of years, since, apart from the period of training, the supply of additional teachers may be limited by competing occupational claims on the age group entering training colleges. In some developing countries provision for secondary education has not yet been expanded sufficiently to ensure sufficient numbers of entrants to further education.

3.11. Projections of school age population and school attendance should show urban-rural classification to assist separate planning, appropriate so far as problems differ in urban and rural areas. In the urban and many rural areas of most developing countries there is a pressure of children on available places in schools. In some rural areas however population may be so dispersed that schools must be smaller or transport provided for children. Special planning for rural areas will become increasingly necessary if proposals are carried out to teach a curriculum designed for the needs of rural populations. For regional planning population data are needed for each administrative district.

Health Planning

3.12. Planning in the health sector has great importance especially for developing countries where there is room for considerable improvement in general levels of health, and curative and preventive health services are greatly limited. In addition to the personal and social sectors involved in improved health, the relationship between health and productivity may have considerable effects on economic growth.

3.13. The starting point of a comprehensive health plan is normally the assessment of the existing levels of health in the population and the needs for all types of health services. Comprehensive health surveys should secure reliable information on: (i) the health situation of the nation; (ii) the services needed for the health protection and promotion of the people, including vital and health statistics, and the condition of existing medical and health facilities and the extent to which they are used by the population; (iii) education and training of medical and health personnel; (iv) the necessary equipment and supplies for health services and the available financial resources. In many countries, and particularly in developing areas, the range of health problems is very great, so that priorities need to be determined as a guide for the setting of objectives and targets, and subsequent plan implementation. According to the World Health Organization these priorities may include the following:

(i) emphasis on prevention; (ii) provision for services to people engaged in productive work; (iii) provision for services to vulnerable groups (e.g. mothers and children); (iv) the services provided should affect the health of the maximum number of people - (v) provision for improvement of the nutritional standard of the population.

4.14. The types of demographic data needed for planning in the health sector are summarized in earlier reports. Such data are needed for the planning of all types of health service so that populations at risk can be estimated both for present needs, and projected over plan periods. Total population numbers, age-sex structures and geographic distribution of population are needed for the planning of general medical services, and targets for the numbers of doctors, health personnel, hospital beds and other facilities are usually expressed per 1,000 population. The planning of maternity and child welfare services need accurate data on fertility, still-births, maternal mortality, infant mortality, and mortality rates for children up to the ages included in the service, as also data on morbidity of mothers and children so far as available. The age and sex structures of populations are important also since a number of diseases are at least to some extent age-group specific; there are also very important examples of diseases with markedly different sex prevalence rates, e.g. heart disease and certain types of cancer. Degenerative diseases and handicaps associated with old age become increasingly important with increasing life expectancies, giving particular relevance to age-sex data on the elderly.

4.15. Since reasonable access to health services is essential except for highly specialized branches, all relevant demographic data should be available and projections made for administrative and in some cases local areas. Urban-rural classifications are also important, mainly on account of very great differences in population density, calling for special types of rural health service. Provision of water supply and sewerage also depends on population densities; a target to supply these facilities for communities of 2,000 inhabitants or more has been suggested. In many countries it is proving difficult to persuade medical personnel to work in rural areas and staffing plans may have to include appropriate incentives. Special provision is however

required for certain occupational health hazards, depending on data on the siting of certain industries and the numbers at risk. Data on migrant groups are needed since their health needs may differ from those of resident populations.

2.16. Demographic data in the health sector are required not only for planning but also for evaluation of the progress made in implementation, since some demographic characteristics serve as major indicators of health levels. There is appreciable need on both counts for improvement in the availability and quality of demographic (and other) data particularly in developing countries. Data on morbidity and the factors affecting the use of health services are however insufficient also in developed countries.

2.17. The major indicators of health levels are mortality rates (crude death rates, infant mortality rates and so far as available expectation of life at birth rates). Fertility rates are however of very great importance in the planning of maternity and child welfare services, and in other sectors because of the crucial role played by fertility towards determining total population numbers. Data on fertility, with a number of alternated projections, provide the basis of policies and programmes for family planning, normally budgeted and administered within the health sector.

2.18. Reasons for the importance of long-term planning in the education sector apply with added emphasis in the health sector, in so far as the training of medical personnel and the building of hospitals and health centres require longer periods than the training of teachers and building of schools. There are, however, considerable difficulties in estimating future health needs for long-term plans, because of changes in medical knowledge and uncertainties how far existing knowledge will be used to reduce levels of morbidity. The general health needs of developing countries may be very seriously affected if it should not prove possible for food production to increase faster than the growth of population. A recent report recommends that health plans be drawn up for ten, five and one-year periods.

2.19. The special problems of providing hospitals in rural areas must take account of projected changes in rural population as a result of continuing urbanisation. In planning for the deployment

of rural health establishments and rural health staff, the geographical distribution, density of the population and the net population increase as revealed by censuses, must be known. The density of the population and the adequacy of the local communication system will influence the distribution and density of peripheral health units. Some practical experience is being gained on the effective catchment areas of peripheral health units, but it might be desirable to have closer studies on the optimum distribution and density of rural health centres and sub-centres. At the present stage of development of rural health services people may make use of modern health services at a much faster rate than the population increase.

4.18. Some methodological issues in the use of demographic data are examined by Sachl. In estimating the size of the population to be served by a particular health service, a distinction is drawn between cases entitled to be served and those actually served; alternative hypotheses may be used, for example, on future developments in fertility and mortality. With respect to selecting a site, "Other things being equal, it may be desirable for the service to be located in such a way as to minimize the distance which those it serves, have to travel between their homes and the service."¹

Planning in the Housing Sector

4.19. Special importance applies to plans for housing in view of current and projected population growth, adding new problems to existing deficiencies in housing. The greater problems certainly lie in the developing countries, with greater existing deficiencies, greater rates of population growth, and many alternate calls on smaller per capita incomes. The provision of adequate housing is not only a social goal but may have direct relevance to economic growth, both by providing substantial employment and by the positive effects on productivity of having the labour force housed in conditions at least adequate to maintain good working health.

¹ V. Sachl: The Use of Demographic Statistics in Planning and Administering Community Services, Baby Welfare Clinics and Related Services, Population Seminar, Geneva, 1977, Paper No. 11.

1.12. Demographic aspects are acknowledged as a major determinant of housing policy. "The first aim of a housing policy is to take into account the demographic current trends and projections and their probable influence upon the family structure. Having in mind, for instance, the transition from the extended family to the nuclear family and the social emancipation of adolescents, the housing stock in the neighbourhood should include dwellings for small households. A variety of housing types and sizes is desirable in order to adapt it to future variations in the family structure. Planned housing has special significance when whole towns or large parts of towns are built or rebuilt. New towns have been built since the last world war in a number of countries, particularly to cope with problems of "population overspill" arising in the main administrative and industrial urban centres. The pace of urbanization has quickened throughout the world, and is increasing further in many developing countries. Problems caused or aggravated by growing urban population densities include transport between home and place of employment, pointing to the need for greater co-ordination between plans for housing, siting of industry and traffic control. The creation of new industrial estates and schemes for settlement also require housing programmes. In many developing countries growing populations and housing shortages have led governments to formulate plans for housing including schemes for self-help and community development.

1.13. Developed and developing countries alike are faced with extensive problems in slum clearance arising from population growth, rising standards and insufficient investment in the housing sector.

1.14. Basic demographic data and projections required for housing plans include total numbers of population and numbers and sizes of households and families. Statistical concepts used in the assessment of housing requirements are defined in U.N. publications. According to nationally adopted standards such data should show current shortages as indicated by over-crowding, doubling up of households and the use of substandard and inadequate housing units. Future needs should include the replacement of units, and an estimate of the number of dwellings required to house population gains. Since 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.

4.25. Data and projections of households and families have enhanced value through urban/rural classifications, particularly in regions with a quick pace of urbanization. Projections for local areas, particularly those of rapid growth or selected for development are also important. So far as data permit account may be taken in projections of the factors influencing household or family formation and dissolution. Special importance also rests in fertility projections, fertility being a main determinant of household and family size.

4.26. Although plans for the construction of houses can be reviewed annually (and may need alteration on account of non-fulfilment of targets or unexpected population mobility) medium and long-term planning is important so that local housing development can be related to regional planning and the overall national plans for economic and social development.

4.27. Demographic aspects apparently deserving greater attention in planning are the relation between housing needs and migration, and the changing housing requirements of individual families and persons throughout life. While the importance of mobility in the labour force is often stressed in plans for economic development, the inducement offered to economically desirable migration by the provision of adequate housing may merit greater attention in development plans.

4.28. The changing housing requirements of persons throughout life, and implications for planning, have greater relevance to the developed countries, but may be expected to appear increasingly also in developing countries, as industrialization, urbanization and overall economic development impose family and kinship patterns closer to those in developed countries.

4.29. Various methods are used to estimate the number of families or households in need of separate dwellings. Regarding the size of a dwelling unit a simple standard would be a fixed ratio between the number of rooms and the number of persons.

4.30. A relatively simple method of estimating trends in the number of dwellings required is to use census data on the population and number of household heads classified by sex and age groups.

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together with future population projections by sex and age group. "Because of the uncertainty of future developments, it is customary and prudent to prepare several series of projections to illustrate the levels and range of figures which may result from alternative trends in population size, age and sex composition and marital and family status".

4.31. Finally, it needs to be pointed out that the required output of future housing does not only depend on population growth, current shortages and deficits, but also on the rate of replacement of an average housing unit.

CONCLUSIONS

4.32. Certain features of Development Plans and reports on planning problems and techniques may deserve comment. In general, small attention is given to demographic aspects. While some plans are impressive documents, others are in some respects disappointing. Some plans consist largely of lists of projects and although presented under customary sectors, apparently show little analysis relating economic, social and demographic variables, perhaps understandably a major preoccupation of such plans is to allocate financial resources among the many, perhaps equally urgent, projects. Most countries have only a short experience of planning, and its formulations and techniques are to some extent under revision from experiences gained in plan implementation. It is a greater disappointment, however, that numerous reports on planning likewise give only small attention to demographic aspects of planning and development. A further feature of plans and the majority of reports on planning is the general absence of discussion and targets based on alternate (or a series of alternate) projections of demographic variables.

4.33. It is natural that planners should write on planning, and demographers on demography. Beyond this the prevailing time scales and sense of urgency of planners, politicians, demographers, economists, and sociologists may differ markedly. Apart from long-term perspective plans, a great and perhaps growing sense of urgency pervades the practice of planners. It may be that the politician and the planner regard the solution of demographic problems as essentially long-term. In that respect it should be a task for demography to present its case convincingly to planners. The closer approach of demography to planning, and of planning to demography, is needed.