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CASE STUDIES OF ARRANGEMENTS FOR EVALUATION AND UTILISATION OF
POPULATION CENSUS RESULTS - GHANA

Case studies of arrangements for evaluation and utilisation of
population census results - Ghana

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I. Introduction

One of the most important uses of population census results is to provide a factual basis for the formulation of Governments' policies and action programme in various fields of economic and social development. Population and allied data have become, in the modern times, the *sine qua non* for efficient administration.

Even though the raw data as obtained from censuses play their crucial role in decision making, some evaluation, analysis, adjustment and arrangements for preparation of reports in addition to basic census tabulations are necessary before they can be readily utilised by the various departments of government, business and other data users.

Thus the utility of the data is facilitated and enhanced when analytical reports are prepared, bringing together the census figures and other relevant data which bear on specific questions of policy and action, evaluating the data from the qualitative and quantitative view points and interpreting them in relation to those practical questions. The interrelationship between population characteristics like growth, structure, trend and prospects, etc with economic, social and physical development plans and policies becomes possible of interpretation when the data are evaluated, adjusted and analysed.

As an integral part of a modern well rounded census programme, it is thus important to make plans and arrangements for the preparation of such reports and monographs, in addition to the timely and adequate publication of the basic census tabulations.

The value of a national population census depends not only on the administrative and other arrangements made for the use of the results, but also largely on the capacity of the existing and projected machinery of analysis, research and development planning to utilise the data. This capacity is determined by (i) the sources, availability and scope of demographic and allied data (ii) trained personnel and provision for demographic analysis and research and their availability, involvement, coordination and utilisation in the planning processes and (iii) the stage of advancement of economic and social development planning and the level of utilisation of demographic data as well as the awareness of the importance of the population factor as a central point in over all planning.

⁺ The opinions expressed in this paper are those of the authors only and do not represent those of the organisation for which they are working.

This study thus aims to bring forward the importance of the various aspects of census planning and to show what kind of arrangements for the preparation of analytical reports are most practical and feasible for countries like Ghana keeping in mind the data available, the existing training and research facilities and the aspiration for economic and social development.

II. Source of demographic data

Ghana has demographic and allied data from all the four major sources, viz., census, registration, surveys and administrative and other operations. The data, however, vary in quantity and quality. By far the data flowing out of the censuses have been more comprehensive - quantitatively and even qualitatively.

Even though the census and registration tradition in the country go back to around a century, only in the recent years i.e. in the last decade or two that we can consider the census to fall in line with international census recommendations. The registration system still needs to be toned up to be able to throw up data on dynamics of population change in the country.

There have been a few localised or even national surveys geared to answer particular questions and the data flowing out of them have been of acceptable quality considering the sample sizes and field problems. Administrative reports containing demographic and allied data also are not of recent origin, but their accessibility may not be as wide as those for census, registration or survey materials. There are several other administrative or other operations where demographic and allied data are gathered, but in many cases, they are not widely available.

A. Census

Historical Perspective

Periodic and systematic counting of the population and houses or compounds (sometimes concurrently with that of livestock) undertaken by the then British Colonial Administration took place from as far back as 1891 at decennial intervals up to 1948 with exception of 1941 when the II World War prevented the taking of a census. These six censuses covered only a part of the present territory of Ghana. In 1891 the census covered the colony corresponding to Southern Ghana regions.

In 1901 the count was extended to include Ashanti and Brong-Ahafo regions. In that year an estimate was also made of population of the Northern Territories of Ghana excluding the eastern areas (at that time part of German Togoland), for which the count was performed in 1911. From 1921, the part of Togoland under United Kingdom Trusteeship was also covered by the censuses. It should be stressed that boundaries of the then so-called territories, provinces, districts and native authorities or divisions have changed from time to time so that not only are comparisons rendered difficult but even references can only very approximately be indicated. Moreover in the then existing conditions

and with the relatively poor means available, suspicion and often refusal to be counted on the part of the population, the quality of censuses data could not be expected to be satisfactory.

After independence Ghana took her Population Census in 1960. This was the first census in the country which satisfied the essential features of the modern population census. The 1960 Ghana Population Census consisted of two phases : (i) the Main Census, and (ii) the Post Enumeration Survey (PES). The Main Census enumeration covered the entire population of Ghana. The enumeration lasted from the midnight of 20th March up to about the end of April 1960 with reference date, midnight of March 20. The characteristics individually recorded included 11 topics which were the following : name, sex, age, birthplace, country of origin, tribe, full-time education, type of activity, industry, occupation, and employment status. The second phase (PES) was executed after less than 3 months from the Main Census.

The enumeration covered a five percent sample of population as enumerated during the Main Census. The PES had two main objectives : (a) to collect information on nine items identical to those enumerated in the Main Census with the purpose of estimating extent of coverage and content errors in that census, and (b) to inquire into 11 additional topics : migration (external and internal), religion, literacy and language in which literate, secondary occupation, under-employment of employees, marital status, form of marriage, number of wives and residence of spouses, fertility, mortality and housing conditions.

The results of the 1960 census were reported in ten published volumes of which volumes I-IV (with the advanced Report of Vol. III and IV based on a 10 percent sample) referred to results of Main Census, Vol. VI - to results of PES, and Vol. V (General Report) gave detailed information of the major aspects of the 1960 Population Census of Ghana with a preliminary evaluation of it. The three Special Reports included : A: Statistics of large towns; D: Statistics of localities by local authority (arranged in order of geographic code number) showing the number of population and houses; and E: Tribes in Ghana : demographic, economic and social characteristics. Maps of enumeration areas and the census atlas were two additional publications flowing out of the 1960 census operations.

Present situation

The latest population census in Ghana was taken in 1970. It consisted of three phases : (i) The Main Census, (ii) The Independent Evaluation Checks, and (iii) The Supplementary Enquiry. The technique of the Main Census and its programme didn't much differ from that of 1960. The Main Census enumeration started 1st March 1970, with reference date midnight of the same. From 11 topics as included in 1960, the 1970 Main Census excluded information on country of origin and tribe; in addition the following two topics were added : relationship to the head of household, and nationality. It should be also noted that the 1960 Census used a House Questionnaire while the 1970 Census - a Household Questionnaire.

Furthermore, the PES in 1960 was combined with the simultaneous collection of additional population data. In 1970, however, the evaluation checks were separated from the Supplementary Enquiry. The aim of the evaluation checks was to evaluate the magnitude of the coverage error. For this purpose a check survey was conducted about three weeks after the 1970 Main Census. The re-enumeration covered a 5 percent sample of the enumeration areas; a sub-sample of it was more deeply investigated (see III below).

The Supplementary Enquiry was held in August and September 1971, that is about one and a half year after the Main Census. The reference date was not constant but accepted as "last Sundry night" with respect to enumeration areas. All topics on which information was collected during the Main Census were repeated in the Enquiry; the additional topics were the same as in the 1960 PES (see above) plus the items on age of mother at first live birth and age at marriage for both sexes.

1970 Census data are partly still in processing stage. With regard to Reports of the 1970 Population, the Census plans include six volumes of the final report:

- Vol. I The Gazetteer
- Vol. II Statistics of localities and enumeration areas
- Vol. III Detailed demographic characteristics
- Vol. IV Detailed economic characteristics
- Vol. V General reports
- Vol. VI The 1971 Supplementary Enquiry - a Statistical Summary

Special reports planned will include :

- A Statistics of large towns
- B Socio-economic indices of enumeration areas
- C Census data for socio-economic regions
- D List of localities by local authority

As of now ^{1/} only Volume II has been issued; Volumes III and IV are in print. From the series of special reports, report D has been already published for eight of nine regions of Ghana.

Volume II of the 1970 Census Report includes data on the following items by sex :

- (i) age structure (below 1 year, 1-4, 5-9, 10-14, 15-24, 25-44, 45-64, 65 and over),
- (ii) birthplace (this locality, another locality, same region, another region in Ghana; abroad, West African country, other country),
- (iii) nationality (Ghanaian, Non-Ghanaian),
- (iv) regular school attendance by age (6 and over; 6-14, 15-24, 25 and over, with subdivision: Never Past, Present),
- (v) economic activity of the population aged 15 years and over (total employed : total out of it in agriculture, hunting, forestry and fishing; unemployed; home makers, other).

^{1/} Information obtained at the 1 May 1973.

This data were presented for each locality. In summary tables, for each region and local authority percentage data were given.

In the Special Report D for each locality the following information has been included :

(i) from 1970 census data :

- (a) The main source of water supply,
- (b) Number of houses,
- (c) Population : total, males, females

(ii) whenever data were available population in 1960 and in 1948.

The tabulation programme of the main census and supplementary enquiry are very ambitious. For example, Vol. IV (Economic characteristics) will have 41 tables giving economic activity, industry and occupations of persons in various cross classification. The data from the supplementary enquiry on household characteristics, housing statistics, marriage, literacy, economic characteristics, fertility, mortality and migration are anticipated to be tabulated in quite great detail.

B. Vital registration

Historical Perspective :

The earliest known vital registration law, the Cemeteries Ordinance, in the country was passed in 1888 which was later on amended in 1891 extending the scope of most of the provisions of the earlier ordinance.

During the initial stages the vital registration activity was not assigned to any specific governmental agency. When, however, the Department of Medical Services was established in the colony in about the year 1895, registration was associated with the Sanitary Branch of this Department.

Although the Ordinance of 1891 made significant improvements in the registration system as established under the ordinance of 1888, nevertheless, it was the Births, Deaths and Burials Ordinance of 1912 which laid the foundation of a modern vital registration in the country and the entire registration officials were appointed from the staff of the Department of Medical Services.

The Ordinance of 1926 on Births, Deaths and Burials sought to make better provision for the registration system in the country. Some new provisions were introduced and the scope and content of many of the provisions of the earlier ordinance were either extended or made more comprehensive, definite or specific. This ordinance for the first time contained some distinctive provisions for Africans (natives) and non-Africans.

The Department of Medical Services continued to be responsible for registration system until April 1952, when the activity was transferred to the Registrar General's Department.

The current vital registration system is that based on the legislation of 1965. Under this act, provision was also made for the registration of foetal deaths and the act made applicable to the entire population of Ghana irrespective of race or origin.

Following the passage of the above act, a division known as the Births and Deaths Registry Division was established within the Ministry of Local Government to be responsible for the registration system in the country.

In 1972 the administrative responsibility for the system was transferred to the Ministry of Finance and Economic Planning under Gazette Notice No. 14 of 28 January 1972. The Births and Deaths Registry was then put under the direct supervision of the Government Statistician.

Present situation :

The country has been divided into registration regions and sub-divided into 132 registration districts with at least one Registry Office in each district. The regional and district units respectively coincide with the political administrative regions and local authority areas of the country. There are, in addition, some selected reporting bases in the field, called registration centres which constitute the lowest units of the net work of registration offices.

The registry offices and reporting bases are located in the larger towns, most of which were chosen more for administrative convenience, than for statistical purposes. Thus the areas covered by these offices are not clearly specified with the result that registration officials in charge of the registry offices and reporting centres have restricted their registration duties to the towns within which they are located.

Even though these offices are designed to cover about 95% of the population of the country, in 1970 only around 20% of vital events were registered.

The birth and death registration forms contain a large number of details about the events including socio-economic characteristics and cause of death. However, because of quantitative and qualitative deficiencies, the data flowing out of the system has not been of much value for planning and policy making but has served only partly for evaluative studies.

Several proposals have been made from time to time to obtain reliable vital statistics in the country. Recently a proposal has been submitted to UNFPA for assistance for the expansion of the national registration system for births and deaths and development of vital statistics. The project is envisaged to continue for seven years during the course of which by stages it is anticipated that the whole country will be covered with an efficient and acceptable registration machinery. As a preliminary to the larger project, pilot enquiries are to be initiated at Ada and Winneba. So far, however, nothing tangible has evolved out of these proposals, even though the Project has recently been approved by UNFPA.

C. Surveys and Studies

In addition to the regular censuses and the registration system for vital events, there have been several surveys and studies bearing on population matters in the country. Several others are planned in the years to come and a few are already operational.

We shall describe here only a selected few of the surveys and studies which are either at present operational or are planned for the immediate future.

Some of the analytical studies are anticipated to utilise the data from the census and registration systems where as others may partly or wholly depend on data collected from the field. The detailed census data on localities, census maps, etc. have been found to be most useful in sampling enquiries.

(a) The Danfa Comprehensive Rural Health and Family Planning Project :

This project area serves as a training and demonstration centre for community health problems and is anticipated to provide information on health and community living aspects of great value to health administrators and planners. The project area is located not very far from Accra.

The study region is divided into four areas (about 12000 population each) on the basis of demographic homogeneity. Each area comprises a test cell correlating to one particular line of argument concerning the methodology of handling family planning in rural areas.

In addition to following the usual integrated approach of providing maternal and child health care, health education, nutrition awareness, environmental sanitation, immunisation and communicable disease control, the project has some added features like involvement of the community in developing at all stages.

A base line demographic survey which has been completed will then be followed by surveys on child health practices, fertility, male and female KAP, maternal practices, morbidity, etc.

An innovation to the clinical record system is the attempt at a family folder system which at the same time amenable to automatic data processing and easy and accurate retrieval. The demographic data is updated by a net work of vital event registrars and others.

The project started in 1970 and base line surveys were completed by 1972. At present several field studies are in progress and the project is expected to be completed by late 1978.

As of now, very little statistical data have flown out of this survey but since the field studies got under way only recently, a large amount of demographic and allied data can be anticipated in the years to come.

(b) Some methodological aspects of vital registration in selected areas of Ghana

The aim of the project is (1) registration of births and deaths as they occur in the study areas (Larteh in Eastern Region, a group of 14 villages in Adaklu in the Volta Region and Kintampo in the Brong-Ahafo Region), (2) use of the data for testing out certain hypotheses concerning mortality pattern in tropical Africa, (3) evaluating impact of the health and social services in the study areas, (4) studying the patterns of morbidity in the areas and (5) testing suitability of application of Chandra Sekar-Deming formula to the registered events in selected areas. Information on name, date of birth, sex, pregnancy status (for females, aged 14 and more), religion, occupation and education are collected on the total population of the study areas of 17,745 from 3,676 households.

Base line enumeration started in September and the registration of births and deaths in December 1971. In addition to the continuous registration of births and deaths, a cross sectional survey on pregnancies, births and deaths, and population size and characteristics are carried out. This survey is expected to be continued for three years and as of now only fragmentary data have become available.

(c) Sekondi-Takoradi Survey

This is a social survey on housing conditions, household composition and facilities, membership of voluntary associations, demographic and socio-economic characteristics, KAP study and enquiries into births and deaths during the past 12 months, etc.

The field work started in July 1971 and was completed in November 1971. A total of 1,041 houses with 4,260 households and a population of 18,500 were surveyed thus covering more than 10% of the 1970 population of the area.

Data processing is in an advanced stage after which the report will be written and published.

(d) Survey of urban life

This sample survey covering around 400 houses in four socio-economic areas of Accra was undertaken between September 1971 and February 1972.

The main questions investigated are : household composition, housing conditions, length of residence and personal characteristics, kin networks, social life, relation between spouses, and inter-generational relations. The aim is to test the thesis that urbanisation (and industrialisation) inevitably leads to a disruption of family ties and to attempt an analysis of the factor which influence family formation and structure under conditions of rapid social change.

The data are being tabulated and will be published.

(e) The Ghana law and population project

Under this project which is expected to run for two years several demographic and allied studies are under way. They are (i) fertility regulation and property and economic factors, (ii) children and child welfare, (iii) family law and public health and (iv) public health and education.

(f) High level and skilled manpower survey in Ghana, 1968 and assessment of manpower situation 1971

The 1968 manpower survey was undertaken in pursuance of a decision of the Ghana Manpower Board to obtain as a matter of urgency, a factual presentation of the manpower situation in the country in order to provide the board with a reliable basis on which it could formulate proposals and advise government of the manpower problems confronting the country.

The survey was begun in the second year of the Two Year Plan by the Secretariat of the Manpower Board. It was planned to cover as much ground as possible, the aim being to elicit more information on the high level manpower situation in the country than had hithertofore been collected in a survey of this kind. It included all establishments employing 20 or more persons and involved 1,150 establishments and 339,274 persons.

The questionnaire on manpower included information on principal activity of establishment, subsidiary activity, number of employees by sex, nationality (African, non African) all for the period 1965-68; number of vacancies in 1968, number of new workers employed between January 1968, and July 1968, number of workers who left employment since January 1968, unskilled manual workers out of total workers as of July 1968, middle school leavers among unskilled workers, best estimate of future numbers of employees for the period 1969 and 1970 with explanation about the above estimates, number of workers anticipated in establishment when in full capacity and other relevant details. Data on training of employees and expected output of the various training institutions were also investigated.

D. Administrative reports and other sources

Demographic and allied data also are available from administrative reports and other activities of the government and even private organisations as by-product of their operations. For example, the statistics collected by the education department from its schools and institutions are invaluable source materials not only for the educationists but they are also important to the planners and policy makers.

The 1968-69 report on Educational Statistics published by the Ministry of Education contains not only stock data on various aspects of education in the 1968-69, it also provides times series data on growth of enrolments and institutions, teaching staff, examination performance and educational finance

The Health Statistics reports provide the data needed for planning public health measures and preventive actions even though the quality of data flowing out of the system is not upto the needed level.

Another source of valuable data are those collected at the hospitals, clinics, health centres etc. They provide much needed data on health requirements of the community.

Another source which has not played its proper role is the one dealing with international population movements. However, fragmentary and incomplete the information may be, these figures provide us with some idea about movements across international borders.

The labour offices also collect some information on employment etc. and data on unemployment, have been published. Statistics from religious organisations on births, deaths and marriages also could have their utility.

Recently some statistics have become available through the governmental and non-governmental activities in the field of family planning. There are several family planning clinics collecting information on those who visit them for their services and the service statistics flowing out of the clinic records and case cards for the last more than 2 years are useful tools to demographers and planners not only for the evaluation of the programme but also for studying the impact of the programme on the society and on fertility in particular. A survey of acceptors and non acceptors of family planning programme is being planned by ISSER and will soon be in operation.

We may also add that a national household budget survey is in the pilot enquiry stage and after the experience in the field in the pilot, the full survey will be operational soon.

Hence we note that the data available so far and anticipated to be produced in the next few years are quite adequate for meaningful planning not only to the administration but also to the other data users, even though the flow data from the registration system at present has been incomplete and defective. When the dynamic data become more reliable, the planning process can be further geared for more sophistications.

III. Evaluation of census results

Census results which are the end products of massive field operations and office processing, could have various types of errors, biases and deficiencies. Errors could enter the data through any one of the various aspects by which they are obtained. The questionnaire, the interview, the interviewer, the field work, the respondent, the recording, the processing and the printing are the various channels through which the data are collected and unless all precautions are taken, the data produced may be so defective as to be of not much value. Even when the strictest controls and precautions are taken, some errors could still lurk in the data and it is essential that they be detected and appropriate remedies taken, so that either the errors are removed or reduced.

or at least their approximate magnitudes indicated thus ensuring that the users would not be misled. Also for future work of similar nature, these become guidelights so that one can be wary of their possibilities and guard against their recurrence.

The census results can be evaluated both by the direct and indirect methods. The direct method includes the post enumeration surveys and sample checks whereas the analytical methods, comparisons of census results with data from other sources like registration, survey and administrative or other operations, use of models and analogies comprise the indirect methods.

Unfortunately, as mentioned earlier, there was not post enumeration survey to check the content errors of the 1970 census of Ghana. One was planned, but later due to personnel problems, it was converted into a case study of Axim. There were also two experiments - one to compare the population aged under one year in the census with births registered between 1 March 1969 and 1 March 1970 at selected urban centres, e.g. Axim, Cape Coast municipality, Sekondi-Takoradi etc. by a matching process and a second one, a coverage error evaluation programme, conducted 3 weeks after the main census, which involved re-enumeration of a 5 percent stratified systematic sample of enumeration areas.

For the matching of child population in the census with registration statistics, the items used were sex and birth place of child, name of mother, birth date and in some cases, age and occupation of parents, in addition to other identification characteristics like serial number of house/household, residential address etc.

The coverage error check aimed at investigating coverage of households and houses within selected EA's (enumeration areas) and people within houses and households. Information on age, sex, occupation and identification items like serial number of house compound was collected on respondents enumerated during the coverage check and these particulars were matched with the census information. Then a sub-sample of these EA's was selected after stratifying the above selected EA's by magnitude of discrepancy of unmatched events in either the census or the coverage check. In selecting the sub-sample, larger representation was given to bigger discrepant EA's.

Details about the results of these experiments are presented and analysed in the paper by de Graft-Johnson and Ramachandran 2/.

As of now, only a part of the data from the main census and supplementary enquiries have become available. Single year of age-sex data for Ghanaians and non-Ghanaians and statistics of localities and enumeration areas giving some information on age in broad age groups by sex, birth place, nationality, regular school attendance by age groups and economic activity are available from the 1970 main census enumeration. All these data other than the single year of age data are given for the whole country, for the nine regions and by local authority within regions.

2/ K.T. de Graft-Johnson and K.V. Ramachandran, Evaluation and analysis of 1970 census results of Ghana, Paper presented at the seminar on Techniques of Evaluation of Basic Demographic Data, Accra, 16-28 July 1973.

Between 1960 and 1970 the Aliens Compliance Order was passed resulting in (i) the outmigration of a sizeable number of aliens in 1969 and 1970 and (ii) the possibility of those aliens who remained in the country to report themselves as Ghanaians in the 1970 census counting. The statistics of 1960 census and the data collected on external movements are of not much help in this situation. In 1960, to avoid the possibility of aliens reporting themselves as nationals, the question on origin was asked where as in 1970 it was a direct question on nationality. Again, the statistics collected by the government departments about external movements could have been incomplete due to obvious reasons. For example, the number of persons who entered Nigeria and Niger from Ghana in the wake of the Aliens Compliance Order were reported to be about double those recorded by Ghana. Then there is the problem of return migration and fresh migration which are equally poorly documented.

Data on births and deaths during the decade if available in an acceptable fashion could have been used to prepare the balancing equation, but this is not possible due to lack of data.

An indirect balancing equation method is the growth rate method which indicates gross discrepancies, if existing. For example, the total population (including Ghanaians and non-Ghanaians) grew at only 2.2% for males and 2.6% for females - one of the lowest rates for developing countries with known drastic fall in mortality and very little decline in the high fertility.

The Ghanaian population, on the other hand, grew at 3% for males and 3.1% for females. Obviously, the Ghanaian population in 1960 excluded a few persons because of the question on origin and the 1970 Ghanaian population included a few (who should have not been included) because of political or other reasons. The Ghana born persons however grew at 2.7% for males and 2.8% for females per annum. These growth rates look reasonable under the conditions of fertility and mortality expected to exist in the country during the decade.

That a sizeable number of aliens left the country during the decade and perhaps a few reported themselves as Ghanaian in 1970 are evident from (i) the decline of the alien population percentage from 12.3 in 1960 to 6.6 in 1970 and a sex ratio decline from 147 in 1960 to 136 in 1970 (ii) the high growth rate of the Ghanaian population in the decade indicating very low mortality rates (survival ratios of all persons in 1960 to age 10 and over in 1970 were male : .8628 and female : .8881, implying a level of expectation of life at birth of 41 and 46 for males and females respectively) or very high birth rates (of more than 55).

Thus we see that the basic age-sex data has been vitiated but at the same time the quality of reporting age and sex seems to have improved as indicated by digit preference indices, age and sex ratio scores, etc. More details about the quality of data are presented in the paper by de Graft-Johnson and Ramachandran.

IV. Population analysis undertaken and data utilised in planning

Even though some analyses have been carried out of the 1960 census and PES results, it is unfortunate that the massive data produced in the main census and PES have not been subjected to the types of analyses and interpretation that are possible.

In the 1970 census and supplementary enquiries again much more detailed data have been collected and are being processed and published. Along with the growth of demand for demographic data, there has been a parallel growth of the science of demography and new techniques and methods have become available to draw out of the data much more than what was considered possible only a decade ago. Again, in Ghana itself there are at present quite a few capable demographers who with the aid of modern electronic computers could subject the data to depth analysis and make the results and interpretations available to the planners and policy makers.

As of now, only a small part of the census results has become available and as such the types and varieties of analyses undertaken so far have been not spectacular. However, some preliminary analyses as indicated in the next few paras, have been carried out and broad conclusions drawn therefrom.

A. Over-all analysis of census results

In addition to calculating growth rates of population by sex and regions, the age-sex structure of the population has been utilised to derive demographic measures. Internal and rural-urban migration has been estimated by the census survival ratio method based on age sex statistics so far available. Quite detailed data on migration based on place of birth and place of last residence and duration of residence in place of enumeration are yet to be published but once the data become available, depth analysis of the migration statistics will be possible. Data on economic activity, industry and occupation also are still in the publication stage and the tabulation scheme envisaged vouchsafes that quite detailed analysis can be undertaken when once the publication is out. The data on household, housing, education, fertility, mortality, marriage and so on from the supplementary enquiry are planned to be tabulated and published in such details as to be possible for a demographer to analyse them in depth, draw conclusions and make it available for the planners and other data users to utilise the results.

The analysis so far carried out on the basis of the 1970 census and 1971 supplementary enquiries have enabled us to estimate the levels and trends of fertility and mortality, estimate international net migration, estimate future population by age and sex for the next 15 years and arrive at some broad conclusions about the interrelationship between population and socio-economic development. More details of the data evaluation and analysis undertaken on the data from the 1970 census and 1971 supplementary enquiry of the country is presented in the paper by de Graft-Johnson and Ramachandran. Further incisive analysis could be undertaken when the detailed tabulations are prepared.

B. Data utilised in planning

Demographic data have been utilised by the planners, administrators, researchers, private business and industry in the country. The Seven Year Development Plan 1963/64 to 1969/70 utilised the 1960 census data to estimate labour force changes in the period of the plan. Projection of enrolment in primary, middle and continuing schools and teacher requirements for the period 1964-70 also were made and utilised in the plan document to estimate outlay on the education head of expenditure.

Regarding health planning the meagre demographic data from the registration system, fortified by census and survey figures were utilised to arrive at targets for health services. Housing planning also relied on the statistics from the census and survey especially the prospects of urbanisation and city growth. Economic growth, agricultural development and food needs of the nation were also envisaged keeping the population base in mind.

The two year development plan mid 1968 mid 1970 put much stress on manpower, employment, high level and skilled manpower and urbanisation and housing. Even though the above two plan documents utilised population statistics for planning, it was in 1968 that the government became aware of the high growth rate of the population and incorporated a population policy along with its planning processes. The publication of the government, "Population planning for national progress and prosperity - Ghana Population Policy, 1969" mentioned, "this is the first time in the history of this country that the government has defined its policies on population and has taken a definite stand in the matter of population growth".

Birmingham et al. in their "A study of contemporary Ghana"^{3/}, analysed and utilised the 1960 census results and arrived at some ideas about the social structure of the country.

At present the planning department is in the process of preparing plan documents for economic, social and physical development of the country and the recent census and other demographic data are being utilised for the various aspects of planning.

The research institutions and particularly the universities would find the wealth of demographic data flowing out of the 1970 census operations and 1971 supplementary enquiry a challenging opportunity for data analysis, data evaluation and adjustment. The Regional Institute for Population Studies at Legon has ambition to utilise the massive data from these operations not only for training purpose but also for initiating research projects and be of help to the administrators and planners in their planning and decision making processes.

^{3/} W. Birmingham et al., A Study of contemporary Ghana, Vol. II, George Allen and Unwin Ltd., London, 1967.

The private business and commercial interests would find the vast demographic and socio-economic data made available, very useful in their plans of operations and strategy for future expansions. The Insurance Companies which already utilise the mortality and health data in their day-to-day operations would be benefitted by the statistics flowing out of the census operations, and the results of the analysis would help them in their business.

Thus we note that the demographic and socio-economic data are very valuable adjuncts to planning and policy making not only to the government but also to the private enterprises.

V. Plans for the next census

As mentioned in Section I, Ghana has a tradition of taking a census count once every ten years excepting for the fact that after 1931 there was only one count in 1948 before 1960 because of the problems created by the Second World War.

There have been two successful censuses at ten year interval since independence in 1960 and 1970. Hopefully the next census due in 1980 will be taken in as much details as these two previous ones but right now it is quite premature to assess the plans and programmes for the next census when the 1970 census results are still being processed and it may be several years from now before all the relevant data get published let alone be analysed and utilised.

VI. Institutions dealing with demographic research

Demographic factors are an essential element in formulating and executing sound economic and social plans. Demographic data and their analyses and inter-relationships are thus of great importance to the administrators, business and commerce and to research institutions and agencies. Demographic research institutions will have a major role to play not only in the analysis of data but also in bringing forward the utility of demographic and allied data in planning and policy making and in interpreting the findings.

In Ghana, the main institutions dealing with population research and analysis are (i) the Central Bureau of Statistics, (ii) the Universities, (iii) the Insurance and banking corporation, (iv) the Statistical cells in the various ministries of the government and in the private enterprises.

The Central Bureau of Statistics (which includes the Census Office) of the Ghana government in addition to producing demographic and allied data, carry out very detailed analytical studies, evaluative enquiries and other demographic and population research investigations.

The University of Ghana at Legon has a wide variety of research activities in the field of population. In 1966 the Demographic Unit was set up with Population Council support, within the Department of Sociology with one of the aims to promote population studies. This unit has carried out several field enquiries and has done excellent analytical and evaluative studies. The Institute of Statistical, Social and Economic Research (ISSER) collaborates with the Department of Social and Preventive Medicine of the Ghana Medical College, in

conducting surveys in household conditions, pre school children's records, vital statistics, etc. The ISSER is in the process of expanding its demographic staff and demographers, manpower specialists, etc. will soon be appointed. Several surveys and enquiries in the field of population-national household budget survey, survey of acceptors and non acceptors of family planning programmes, etc. are planned to be carried out by ISSER in collaboration with other interested agencies.

In 1965, a comprehensive rural health demonstration, teaching and research project was conceived and developed by the Department of Preventive and Social Medicine of the Ghana Medical School. In 1970, the University of California in Los Angeles, School of Public Health became a collaborator on the project.

Recently a Population Dynamics Programme (PDP) has been set up at Legon. One of the aims of this programme is "... to stimulate research into the many facets of population studies by various professionals in Ghana and elsewhere in Africa" ^{4/}. During the first three years of its activity, PDP will assist some approved research projects for which funds will be provided by USAID through the University of North Carolina and from the University of Ghana itself. Professional and financial support from University of North Carolina is anticipated for a period of 5 years.

In February 1972 the Regional Institute for Population Studies (RIPS) was established at Legon under an Agreement signed by the United Nations and the Government of Ghana. In addition to training demographers, the Institute will undertake research in the field of population catering to the needs of the region. Three types of research activities are envisaged : (i) student research, (ii) staff research, (iii) collaborative research of RIPS with other Institutions and agencies in the region or elsewhere.

The trainees for the Diploma and Master's degree courses undertake a research project. The staff members of RIPS in addition to guiding the trainees in their research, may carry out research studies on problems of immediate interest and usefulness to the countries of the region. The Institute may also cooperate and collaborate by making its resources available to institutions and agencies who would like to take advantage of the physical facilities and technical competence of the staff and it is anticipated that governments in the region including the government of Ghana will utilise the research facilities of the Institute in their various planning and policy making activities.

Already the Institute is actively associated in a technical advisory capacity with the CBS on vital statistics, with ISSER on survey of family budget and family planning acceptors and non acceptors, the Danfa project and a proposed project in Nigeria and elsewhere in the region on sub-fecundity, infertility and sterility.

^{4/} Population Dynamics Programme, University of Ghana, Legon, 1972 (mimeographed pamphlet).

In various other departments of the University of Ghana also there are some research activities in the field of population being carried out. For example, in the Faculty of Law a project, "the Ghana Law and Population Project" has been initiated and is expected to continue for 2 years. There are demographic research activities currently taking place in the Sociology Department, Economics Department, Department of Nutrition, Home Science, Nursing Department, etc.

A population research and teaching facility is currently being created at Cape Coast University under Population Council support. The research will be oriented towards catering to the Western Region of Ghana. The programme is expected to run for 5 years.

Some demographic research activities especially on land use and housing are in the University College of Science and Technology and also the Building and Roads Research Institute, both at Kumasi.

The Insurance Companies, banks and private commercial and trade enterprises carry out their own demographic and socio-economic enquiries needed for their efficient operations. utilise the demographic and socio-economic data from census, survey, registration and other operational aspects and sometimes even rely on analytical studies carried out by research agencies for their enterprises.

VII. Training in Demography

In many countries, demographic research has not kept pace with the development of demographic statistics, mainly because of inadequacy of demographic training facilities and shortage of trained personnel. The growth of the science of demography in recent decades has been phenomenal and the new and powerful techniques of demographic analysis have made it possible to gain wider and deeper knowledge of population phenomena.

Till 1972 provision for comprehensive training in the field of population was non-existent in the country. There were only a few courses given in the various departments of the University of Ghana where the orientation was specific to the parent departments' field of interest.

For example, the courses given in the department of sociology were more of a substantive nature and sociological in content. ISSER has an optional paper on demography which was more or less statistical and technical in nature. The diploma in statistics has a course in demography which is of an elementary nature. The optional paper on demographic statistics and population analysis for the master's degree in statistics of the department of mathematics is mostly in technical demography and demographic sample surveys. The Population Dynamics Programme at the University provides fellowships for graduate students of Ghana and other West African nations to obtain the needed understanding and skills in population research and programme planning.

The leading role in training in demographic in Ghana belongs to the Regional Institute for Population Studies (RIPS) situated within the campus of the University of Ghana. The objective of the RIPS is to promote and strengthen research and training in demography and related fields in interested English speaking countries of Africa. The Institute is jointly sponsored by the United Nations and the Government of Ghana. The United Nations provide the services of main part of the academic staff, fellowships for trainees, as well as cover certain other expenditure (for books, technical apparatus, travel, etc.). The Ghana Government provides the services of the remainder of the staff, premises and accommodation and other physical facilities, service of part time lecturers, etc.

The basic course in population studies given by the Institute is the Post Graduate Diploma. This course is a comprehensive one covering the various aspects of population studies and attempts to impart training in data collection methodology, data analysis and utilisation. In addition to formal lectures, the subject matters are inculcated through practical laboratory exercises, discussion groups, field experiences and research.

In addition, there is a Master's degree course which is primarily intended for those who passed the diploma course or equivalent with good marks and who have proved their interest and ability in independent research.

These courses start each year in October along with the other courses of the University of Ghana. The diploma course is for one calendar year, of which the first 7-8 months are devoted to formal lectures, laboratory work, seminars and discussion groups. There will be a written examination of 3 hours duration each in the four papers - Technical Demography, Mathematics and Statistics, Substantive Demography, and Sociology and Economics. The minimum pass mark is 50. After these examinations, the trainees take active part in a demographic or socio-economic small scale sample survey where they are involved intimately in the various aspects and phases of a survey from planning of the survey to writing of the report. This takes around one month. The remaining time is devoted by the trainees for preparing a short research report on a problem selected by them in consultation with the staff of the Institute. The research work is reported at a seminar of staff and students.

The Master's degree course is predominantly devoted for carrying out an independent research project under the guidance of the staff. The research will be evaluated by an external examiner and is hoped to be of acceptable quality for publication in a standard demographic journal. The course which runs for one academic year will also consist of guided reading, special lectures, seminars and discussion groups.

In addition to the diploma and master's degree programmes, the Institute may also have from time to time special ad-hoc and short term in-service courses to meet the demands of countries of the region. The RIPS may also provide suitable training and facilities for the Ph.D. degree in Population Studies.

Provision now exists for a total of 25 U.N. fellowships for the diploma and master's degree courses each year. In addition, the Institute can accept trainees who are financed by other agencies, like the PDP.

The Institute is cooperating with the University of Ghana by arranging lecturers and laboratory work for students from other departments who have opted for the paper in demography in their main field of interest and may be willing to help other training institutions in the region with their training programmes.

VIII. Recommendations and Conclusions

There is a common tendency in some of the developing countries that after the first spurt of activities in connection with census taking and the actual enumeration, there is a marked lag when it comes to processing of the data. Computerisation has not eased the situation. Publication generally is so delayed that sometimes it is not completed even when the next census date has arrived or passed. Attention then shifts to the new data rather than getting out what was produced earlier with so much efforts of men and materials. Regarding analysis and utilisation of the voluminous census materials, the situation has been even worse and the full benefits accruing from the census results to the society has not been achieved.

In Ghana, in 1960 the census results were published in quite reasonable time, but the full publication schedule could not be adhered to. For example, originally there were to be five Special Reports A to E. As of now, only Reports A, D and E have been published; Report B, "Socio-Economic indices of enumeration areas" and Report C, "Census data for new regions" was produced in mimeograph form only.

The 1970 census tabulation and publication programme is impressive. Only Volume II and Special D for eight out of nine regions have yet been published and the other five volumes and three Special Reports are in various stages of processing and publication.

One of the salient features of the 1970 census was that the data were put on tape and computerisation was used at all levels of data processing. One obvious advantage of transferring data to tape is that it can be made available for other data users, with appropriate safeguards as to confidentiality. How far this can be achieved practically is another matter. At least it should be possible for research institutions to obtain additional tabulations from the tapes.

Another important facet of a modern census operation is the utilisation of data in the preparation of analytical reports and monographs. The data from the 1970 census could easily be used for preparation of analytical and methodological reports on data evaluation, migration analysis, derivation of vital measures, etc. Census monographs on manpower and labour force, education, housing, migration and urbanisation, differential fertility, mortality, growth of cities, socio-economic characteristics of cities and so on could be commissioned to research institutions and individuals and needed data made available. The RIPS could play a vital role in these activities.

Now a word or two about the vital registration in Ghana. As noted earlier, the system has not been able to produce viable results and it may be extremely difficult to tune it up to enable it to produce statistics at the national level. However, as experienced in other developing countries in Asia, Africa and Latin America, sampling methods could be combined with continuous registration activities to arrive at reasonable and useful estimates of fertility and mortality rates. Sample registration scheme could be initiated at rural and urban areas to produce national and then regional statistics.

There is need for carrying out a comprehensive national demographic survey on lines similar to the 1968 survey. The optimal time would be 1974-75. The census results could be utilised to design a multi-purpose multi-round sample survey to obtain demographic and socio-economic data needed for planning and policy making.

With emphasis of self reliance by the government on all aspects of life, an inventory of resources - both human and material - is called for and it is the duty of demographers and statisticians to aid the planner and administrator to make available not only the data but also their analyses and inter-relationships.