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POPULATION DATA COLLECTION, ANALYSIS AND DISSEMINATION IN AFRICA DURING THE PAST DECADE : ACHIEVEMENTS IMPLICATIONS AND RECOMMENDATIONS

This paper is intended to provide participants with background information for the discussion of item 4 of the provisional agenda.

This paper has been issued without formal editing.

DEMOGRAPHIC DATA COLLECTION, ANALYSIS AND DISSEMINATION IN AFRICA, (1982-1991)

Achievements, Drawbacks, Implications and Recommendations:

INTRODUCTION

It is generally recognised that up-to-date and accurate demographic information especially on population size, structure, distribution and growth potential is one of the important tools for planning, monitoring and evaluating socio-economic development programmes, formulation of relevant policies as well as other administrative activities undertaken by any government. Efforts have therefore been made by African Governments after attaining political independence, to ensure availability of such information.

In support of the efforts, there have been a number of initiatives at the international level over the years to help develop the capacity of African countries for demographic data collection and analysis. The initiatives have included: African Census Programme (ACP) and its successor Regional Advisory Service in Demographic Statistics (RASDS) and in Demographic Analysis (RASDA), The Regional Demographic Training Institutes (CDC, IFORD and RIPS), national demographic training centres, Regional and national Statistical Training Centres (Makerere, EASTC and other STPA Centres and University Departments), World Fertility Survey (WFS), African Household Survey Capability programme (AHSCP) and Demographic and Health Survey (DHS). There have also been a number of country projects, mostly funded by the United Nations Population Fund (UNFPA), aimed at strengthening and improving vital registration.

An important objective of any data collection is for utilisation in planning and policy formulation. Thus the data collected should be compiled, evaluated, analysed, disseminated and utilised inorder to achieve maximum benefits. The integration of all these aspects into a coordinated process still faces some drawbacks.

This paper attempts to provide a brief overview of data collection, compilation and analysis during the period 1982 to 1991 focussing on achievements, drawbacks, implications of the developments and gives some recommendations for future.

DATA COLLECTION

A review of the situation regarding demographic data collection in the African region during the past decade indicates that population censuses and demographic surveys have continued to be the major sources of demographic data. Civil registration systems, however, remained only a potential source in most African countries although in a number of the countries, appreciable coverage has been achieved, particularly in births and deaths registration. Administrative records like those from Ministries of Education, Employment/Manpower/Labour, Health, Housing, Immigration etc. also provide important information, but their integration with census and survey data analysis leave much to be desired.

(A) Achievements

There was significant improvement in both quantity and quality of demographic data during the reference period.

Annex I gives a list of countries that undertook a population census and Annex II gives type and date of demographic surveys undertaken during the period under review, 1982 - 1991. With the exception of Chad, Gabon and Mozambique, all countries have conducted at least one census as compared to 40 during the 1970 round. Besides the increased number of countries participating in the censuses, coverage and scope have widened to include social, economic and housing characteristics. It is also apparent that more than half of the countries undertook at least one demographic survey within the reference period. The most common types were those that combined demographic variables and other subjects. The surveys were mainly conducted as part of the continuing household survey programme particularly for countries participating in the African Household Survey capability programme (AHSCP). Some, were, however, conducted on ad-hoc basis. There were also surveys on Knowledge, Attitude and Practice on Family Planning, Contraceptive Prevalence, SDA - Living Standards, on Family etc.

Data collection activities, particularly censuses which involve large numbers of respondents, interviewers, equipment and material, cannot be error free. Continuing efforts were therefore put into developing strategies and improving on methods and techniques of data collection, processing, evaluation and analysis, all aimed at ensuring a satisfactory product in terms of relevance, accuracy and timeliness. Specifically, significant improvements were made in the area of questionnaire design, training of field staff and application of quality control procedures.

With regard to the questionnaire, improvement included increasing use of verbatim questions, preparation of multi-lingual questionnaires, and, where practicable, precoded questions, to ensure easy handling at the data processing stage. In some instances, pre coding however resulted in restricted scope for analysis.

It is true that data quality is enhanced if quality control procedures are instituted at all stages of data production exercises. Thus, a number of countries took measures to control data quality at the data collection stage which is considered critical in such exercises. The measures included: increased supervisor/enumerator ratio, which, for a number of countries, was 1 to 5; and, deployment of adequate numbers of editors at the field level.

Also, during the reference period, a large number of countries in the Region were involved in strengthening and improving civil registration/vital statistics systems in terms of expanding coverage as well as provision of necessary legal basis, enlightenment of the public, introduction of new data collection methodologies and appropriate administrative changes. In a few countries, improvements in civil registration have been achieved with considerable success, for example, a number of Island countries including Cape Verde, Mauritius, Sao Tome and Seychelles have all attained a reasonable nationwide registration coverage while coverage of events such as births are fairly satisfactory in Algeria, Egypt, Tunisia and Libya.

(B) Drawbacks

Although, generally, significant improvements were recorded during the reference period, it is also true that there were some shortcomings at the data collection, processing and analysis stages in a number of countries. With regard to censuses and demographic surveys the problems were mainly caused by inadequate planning and difficulties at the implementation as well as lack of adequate and timely funding. These are briefly discussed below:

(i) Planning

Data collection programmes particularly population censuses are the most extensive and demanding statistical activity undertaken by any country. Although, on relative terms, technical issues appeared to have been well understood, the administrative and organizational aspects of the censuses/surveys and civil registration seemed to have been handled with less efficiency. Specific drawbacks arising out of lack of comprehensive planning included: failure to determine type of data collection methodology especially for the hard-to-enumerate populations; limited publicity with the result that the public was not well sensitized; and, under-estimation of quantities of materials needed for various census operations. Also, there was lack of due recognition of the fact that the ultimate aim of data collection is its use in planning and policy formulation, so much so that data analysis, interpretation and utilisation were not given their due importance while planning for data collection.

(ii) Implementation

In a number of countries, some short-comings were registered at the implementation stage. These included:

- Lack of adequate staff with necessary qualification and relevant experience in the census/survey and civil registration, caused either by piece meal training programmes or high rates of staff turn-over. Consequently, this resulted in poor preparatory activities i.e, mapping, questionnaire design, evaluation and analysis of data and training.

- Insufficient or lack of reliable transport especially to move materials to and from the field and, enumerators/supervisors or registration clerks to and from their places of work.

- Non-conducive political events and/or inadequate security which, for some countries resulted in postponement of censuses altogether.

- *Unfavourable economic and social conditions making it difficult for field operations.*

(iii) Funding

Funding for demographic data collection and analysis was, in most cases, from two sources, namely, national governments and external donor agencies. For a number of countries, however,

approved budgets particularly from national governments were inadequate or released too late while in others, they were not available when needed. This was aggravated by the structural adjustment programmes with their implications on ' non economic expenditures'. In some cases, the problems caused long delays in census activities which, sometimes, resulted in postponement. Also, since analysis of data is expected to be undertaken some years after the data collection, in many cases, funding was not provided for this important aspect.

External funding was not without problem either. In a number of cases, there were late submission of requests and therefore, with related time lag in processing and approvals, the funding arrived too late for effective utilization. Also, in cases where more than one donor were involved, ineffective co-ordination hindered efficient utilization of the usually scarce resources.

Drawbacks specific to civil registration, and which resulted in limited coverage, include:-

- inadequate awareness among government officials on the importance and use of vital statistics;

- lack of motivation on the part of the public;

- problems associated with registration clerks in particular with regard to experience and qualification; and,

- lack of adequate administrative arrangements and particularly the existing overlap between various ministries and no clear cut delineation of responsibilities as regards vital statistics.

CENSUS CARTOGRAPHY

Appropriate maps are needed at every stage of a census. These maps depicting information relevant to various tasks involved at different stages, not only render their implementation easier but also ensure a measure of accuracy in them which normally may not be possible otherwise. Census cartography, therefore, involves preparation of well contained maps to serve as the basic operational and reference tools for various census operations such as; planning, organization and conduct of field enumeration, data processing and data analysis and dissemination and also as a frame for future censuses and surveys. The production of these maps, in turn, is greatly dependent on establishment of viable census cartography unit and formulation as well as implementation of comprehensive programme of cartographic activities.

During the 1970s when a number of African countries conducted their first post-independence population census, cartographic facilities in census offices, in general, were minimal or non-existent. However, with the assistance provided under African Census Programme (ACP), some of the countries were able to at least carry out pre-enumeration cartographic activities and produce enumeration area maps. But others encountered problems and had therefore to resort to crash programmes or restrict the exercise only to selected areas of the country. Due to inadequacies of human and material resources, these initial cartographic facilities set up in census offices were generally not maintained after the enumeration and consequently there was

virtually no post-enumeration and/or inter-censal mapping activity in most of the countries and they had to start from scratch for their 1980 round.

(A) **Achievements**

A great deal of efforts have since been made to improve the situation. With the sustained support provided by the United Nations Population Fund (UNFPA), United Nations Development Programme (UNDP) and other bi-lateral donor agencies in terms of equipment/materials and training to national staff during the last decade, the objective of establishing viable and ongoing cartography units in the census offices has been achieved to a greater extent. Thus for the censuses carried out during the last decade, the cartography units in almost all the countries have successfully carried out pre-enumeration cartographic activities leading to preparation and production of various types of maps needed for planning, field organization and conduct of enumeration. In some of the countries which planned their census cartographic programmes comprehensively to also include post-enumeration activities and accordingly made provision for the needed resources, the cartography units have been able to take up the preparation of publication maps including census area reference maps as well as thematic/ analytical maps and charts. A few countries have even made programmes to produce national population atlases depicting mainly the data brought out by the censuses. They have also successfully used the cartographic materials for selecting master samples for surveys.

(B) **Drawbacks**

Among the main drawbacks experienced in implementation of census cartographic programmes during the last decade, the lack of appropriate base maps posed to be the most serious. In a number of countries the topographic and other planimetric maps acquired by the census offices were old editions and quite often not on the scales considered to be appropriate for the census work. The use of such maps obviously increased the workload and cost of cartography units considerably since they had to carry out scale transformations often by time consuming manual and semi-mechanical processes, undertake extensive field work and use aerial photographs and other remotely sensed materials to enhance and update their contents. In this regard the usually expected support from the surveys departments/ national mapping agencies, physical planning divisions and/or other governmental agencies was either lacking or provided grudgingly and in inadequate measures as these establishments themselves were often under-staffed and did not have enough resources even to carry out their own regular activities. Thus in many instances, statistical/census offices had to carry out cartographic preparations without proper base maps and eventually resulted in production of deficient maps for the census enumeration. At least in one country it has been noted that the post enumeration survey was vitiated by lack of proper demarcation of enumeration areas. Even though it is known that cartographic preparation is a pre requisite for full geographic coverage, no country seem to have evaluated coverage in respect of areal completeness.

Lack of trained and adequately qualified staff constituted another serious problem for cartographic work. This problem was further compounded by high turnover of the staff trained through the census projects. However, efforts to train additional staff with the support of UNFPA and other bilateral agencies have helped to effectively cope with the situation. At the stage of the implementation of field mapping, the lack of adequate supervision and failure to

institute other quality control measures particularly in the countries where cartographic work was decentralized, has proved to be another issue of serious concern. In some instances the census organizers did not give serious attention to the training of census enumeration staff on the use of census enumeration maps provided to them. Thus the enumerators who found difficulties in reading and understanding the maps often discarded them and resorted to enumerate their areas without maps. Such practices could have caused confusion and thereby cast adverse effect on the enumeration coverage.

It has been noticed that in some of the countries, census cartography ceases to effectively operate during post-enumeration phase as they are switched over to other priority activities, after the enumeration, primarily because of overall inadequacy of staff in the census offices as well as absence of any viable cartographic programmes to keep the cartography staff fully utilized.

DATA PROCESSING

The last decade has been marked by the explosion of the micro-computer technology. Thus, the processing of population data has been characterized by a massive use of micro-computers and a decreasing use of mini/main-frames. It has been demonstrated that micro computer technology is efficient, cheap and easy to use in the processing of data and has enabled many countries conduct data processing activities despite several shortcomings.

(A) Achievements

In the 1980's, most of the African countries had gained experience in population census and survey data processing from previous such activities in the seventies.

The questionnaires were better designed and more oriented to computerized processing. The edit specifications for automatic corrections were more carefully designed, but there were instances where these were abandoned due to time factors.

The technological developments and the improvement of the techniques, made it possible to considerably reduce the time for processing while decreasing its cost, compared to what it used to be in the previous decade. The development of the software packages and the improving capabilities of the hardware made it easier to timely produce more sophisticated statistical tables. This helped improve the quality of the results and widened scope of analysis.

Powerful hardware and software for use in most stages of data processing of population censuses and surveys have been made available since 1985. The stages in which they have been used include :

- Data flow monitoring : The flow of questionnaires and data files which, in the past, was monitored through entries in registers, started to be monitored through computerized data bases.

- Data Entry and verification : Keying of the data, from the questionnaires to the data files on magnetic support, has obviously been done in all the censuses and surveys undertaken during the decade. For this purpose, one of the standard data entry

software packages was used : ENTRY- POINT, RODE-PC, PC-EDIT or the CENTRY module of IMPS. In many cases, verification (re-keying), range checks (control of the validity of codes) and consistency checks (between items) have been included in the data entry process.

- Consistency and corrections : Range and consistency checks of the items and automatic correction of the data files according to provided edit specifications were usually implemented through the CONCOR module of IMPS. Some users developed specific programs (in COBOL, FORTRAN, BASIC,...) for this purpose.

- Tabulation : Many different software packages were used to produce cross-tabulated statistical tables at different geographical levels; among the most widely used software packages, the CENTS module of IMPS was probably the most popular.

- Thematic mapping and analysis: The production of thematic maps derived from the results of census has been attempted recently, using the new POPMAP developed by the U.N. Population software development project. Availability of softwares also aided in more detailed analysis and expedited their completion.

(B) **Drawbacks**

One of the main problems encountered is the high turn over of staff. The main objective remains to train enough staff in time so that they can efficiently participate in the data processing of surveys or censuses. Unfortunately in the 1980's the training activities implemented within the data collection projects were often scheduled too late. The situation was worsened because of very few short or intermediate term data processing training programs and existing ones being expensive. Long term training also would conflict with the project's activities. As a result, internationally recruited resident advisers were often needed to assist in the processing of demographic surveys and censuses.

Communication has generally been poor between subject matter specialists and computer staff. Although there has been a better perception of the impact of the automatic correction on the reliability of the data and, thus a more careful design of the edit specification, tabulation plans were seldom clear and detailed. In many cases these did not include the necessary explanatory notes, definitions and other details required. Population statistics would have greatly benefitted from better communication between statisticians, demographers and data processing specialists.

The tabulation plans, which should always be ready in the early stages of the census or survey in order to guide data producers/users, were usually prepared late. Questionnaires and coding systems did not always make optimal provision for all the details and requirements of the statistical tables to be produced.

The dissemination of the results, both statistical tables and their analysis, has not really been

satisfactory. Very little advantage has been taken from the computer hardware and software available to produce "camera-ready" tables, graphic representation, thematic maps and publications; countries have not really benefitted from desktop publishing techniques and very few of them have built their population data base.

DATA ANALYSIS AND DISSEMINATION OF RESULTS

An important consideration in any data collection is the ultimate use to which the information will be put to. Thus even before embarking on a census/survey, it is essential to involve the data users so that the data collected is the most relevant and essential. This will also enable the statistical office not only to focus its data collection, but also prepare itself for the further stages of compilation and analysis of the data.

In developing countries with high illiteracy or atleast low awareness of the implication of population on development, it is essential that the results and findings of demographic, socio - economic enquiries are widely desseminated . Thus every avenue for publicising the implications of analysis of data should be availed of.

(A) Achievements

Certainly statistical offices have gone beyond mere collection and compilation of data into elementary and sometimes detailed analysis of the information gathered. In addition to publishing statistical tables, many countries have produced detailed analysis volumes including demographic, socio - economic and environmental aspects. Other important features have been the publication of small area/village statistics, useful for local planners; population data sheets, population data folders and other quick aids for understanding the population situation in the country. Again, some countries have included along with statistical tables, some description of the potential uses of the tables, elementary analysis and derivation of indices and measures and generous amounts of maps, graphs and charts. The micro computer technology and softwares have aided them in these endeavours. Annex II gives the status of analysis/dissemination of censuses taken during the decade.

Another fall out from the experience of the past is that statistical offices which used to be islands by themselves and less involved with other data collection/user agencies or institutions have through the collaborative efforts of local personnel from ministries, universities and other institutions come to recognise that the data produced by them become more valuable if integrated with other data sources and analysed more thoroughly than previously possible within their own establishments. True integration of various statistical organisations and institutions could be built up through such collaborative efforts, as evidenced by experiences of some countries.

In view of the greater awareness of population and the need for analysis, training of manpower has assumed more importance. This has resulted in human resource development in statistical offices and thereby enhanced their capabilities.

(B) Drawbacks

The greatest drawback as regards data analysis and dissemination has been the apparent lack of

appreciation of the importance of these aspects at the data collection planning stages. This is obvious from the fact that sufficient attention and funds are not allocated for these activities. presumably under the impression that these activities are quite remote and are expected to take place only many years after preparing for a census/survey.

Yet another important problem is that whereas field operations and data processing usually have allocations for daily allowances/overtime payments, no such financial benefit is provided for analysing data. Full time international experts were recruited to carry out analysis with the view that local analysts will take very long time to complete the analysis and the quality of output may not be acceptable. Experience has been that both these premises are questionable. Team of local analysts have carried out reasonably detailed analysis of not only census/survey data but also integrated other relevant sources like those from ministries etc. and completed the work in 9 to 18 months. With small honoraria payments as incentive, such a mechanism has worked in countries where it has been tried.

Related to the above, local personnel are tempted to involve as much as possible in data collection. Some donors seem to have encouraged these, resulting in less importance being given to already collected data and focus being shifted to carrying out more and more surveys when data from previous surveys are yet not analysed.

There is general fatigue after the data collection and with no incentive available, there is little interest in carrying out the operations beyond data compilation. The tempo generated in the intial stages seemed to have been lost.

Much remains to be done in the fuller utilisation of data and efforts should start from the very initial stages of preparations for data collection by involving analysts, data processing personnel and users along with the statisticians and field staff.

The availability of softwares has not only reduced the time required to carry out analysis, but also has enabled even persons with inadequate knowledge of demography to use them. However, indiscriminate use of softwares without keeping in mind the quality and quantity of data has resulted in conclusions being drawn which may be misleading.

IMPLICATIONS OF PAST ACHIEVEMENTS AND DRAWBACKS

It may be recalled that many African countries are among the least developed both economically and socially. A number of countries have therefore initiated programmes intended to improve the general welfare of the people. Of necessity, the countries will increasingly require, inter alia, demographic, socio - economic and environmental data for implementing, monitoring and evaluating the impact of the programmes and for articulating relevant policies. Although a number of countries undertook population censuses, demographic surveys and civil registration during the review period, data collection agencies will be faced with requirements to: increase data coverage; maintain data collection frequencies; constantly and frequently review data collection methods; increase emphasis on data collection evaluation programmes; redouble efforts to improve data quality; undertake in-depth data analysis; ensure timely release of census results and disseminate findings and implications as widely as possible.

Further, the shortcomings, experienced during the reference period, namely, inadequate planning, difficulties at the implementation stage, funding etc., may require specific attention with regard to capacity building at national statistical offices and at regional offices, improvements and innovations at the international level and funding mechanisms. These are briefly discussed below:

(i) Capacity at national and regional offices

The high turnover of staff has in some cases, reduced the capacity of national/regional offices to meet the challenges of increasing and varied data needs. Thus there is urgent need for continuing training programme not only for higher-level but also middle and lower-level personnel. The need for improved conditions of work needs to be stressed, if the trained staff are to be retained.

Furthermore, various types of equipment will be required. These include, among others, cartographic and printing equipment, serviceable vehicles, computers and accessories, photo-copiers and desk-calculators.

(ii) Improvements and innovations at International level

The existing low level of development of national offices imply that there is continuing need for technical support from the international level, especially from the region. In this connection, it may be recalled that the RASDS and RASDA at ECA assisted almost all countries to undertake population censuses, demographic surveys and civil registration systems, evaluate and analyse the data and publish or otherwise disseminate the findings and implications of results. This included training of national staff as a major component. But, inspite of the well designed training programmes, there is still a high demand for statistical expertise mainly due to high rates of staff turnover. Thus, Regional Advisers will be required to continue assisting African Countries in demographic statistics, analysis and dissemination and use of data for planning .

(iii) Funding

If statistical and civil registration agencies have to undertake more data collection activities, maintain high quality information and carry out in - depth analysis of data , then, additional funding from national and external agencies will be required.

RECOMMENDATIONS

In the light of the foregoing and to ensure that countries in the region adequately respond to increasing demographic data needs and maintain required frequency and high quality data, it is recommended that:

(i) Censuses should be undertaken at regular intervals, preferably ten years. Demographic surveys, especially those undertaken to up-date censuses, should be conducted mid-way between censuses. Civil registration systems should be expanded and efforts made to improve coverage and produce reliable and representative vital statistics which are essential for population projections.

(ii) Comprehensive time-tables for preparatory activities on the creation of census/survey committees, tographic work and questionnaire design should be drawn up and continuously monitored to ensure complete adherence. To ensure constant review of data collection methods, it will be necessary to establish permanent census/survey and civil registration offices.

(iii) The tabulation, analysis and publication plan should be prepared in the early stages of the census or survey in association with data processing staff and users using appropriate software packages. Questionnaire design should take into account the detailed requirements of these plans. Moreover, there is need to develop appropriate softwares for analysis keeping in mind the types and varieties of African data. Before final production run of the totality of tables, it is advisable for subject matter specialists to review sample basic tables and ensure that all tables are consistent with control tables.

(iv) Given the high rate of staff turnover especially for technical and skilled personnel, it is necessary to continue training not only the higher levels but also middle and lower level personnel. To minimize movement of personnel, out of statistical agencies, jobs can be made more attractive, for example by ensuring that conditions of service are improved. Training of staff should be taken as a continuous need till the staff turnover is minimized. Arrangements to provide intensive and specialized training in the newly advanced areas such as automated cartography, applications of satellite data in census mapping,etc should also be put in place to enable census offices utilize new technologies to improve the quality and contents of census maps.

(v) Since large statistical undertaking will always contain errors, these should be minimized by:-

- Providing intensive training programmes prior to major data collection exercises;
- Ensuring that the previously attained ratio of 1 to 5 (enumerator to supervisory staff) is maintained;
- Instituting data check systems at the field level; and,
- Ensuring that there are adequate and well trained personnel for editing, coding and data entry.

(vi) Governments should consider statistical activities particularly census/surveys and civil registration as part of the usual national activities and thus incorporate them in forward budgets. In addition, funds provided should be adequate and given on timely basis. External donor agencies should continue assisting countries that need such help.

(vii) In order to have the census cartographic activities effectively carried out, it is imperative that census/statistical offices should prepare comprehensive programmes for census cartographic work. The programme should indicate precise objectives, methodologies and time table of activities and be integrated in the overall census programme to ensure availability of resources on timely basis and in adequate measures and thereby avoid any possible interruption in its implementation.

(viii) To enhance the utility and applications of census data, preparation of census publication maps which may include census area reference maps and some basic thematic maps, graphs and charts highlighting salient features of population data should also be programmed and taken up as one of the main census activities during post-enumeration phase. The preparation and production of other atlases and geographic reference publications, such as population atlas, administrative atlas, urban area atlas, gazetteer of place names, etc should also be programmed and systematically carried out during post-enumeration phase.

(ix) In the countries where the cartographic work need to be decentralized, the national statistical/central census office should be effectively involved in the recruitment and training of the field mapping staff while the local offices are made responsible mainly for administrative and organizational aspects of the exercise. The central census office should identify the cartography supervisory staff right from the outset and give them necessary training to ensure effective and adequate supervision of the subsequent field mapping work. For the rightful use of enumeration area (EA) maps by the concerned field enumeration staff, it can not be over-emphasized to include detailed instructions on the use of EA maps in the enumerator's manual and provision made for the coverage of these topics in the corresponding training programmes.

(x) In view of the high costs involved in cartographic work, efforts should be made to maximize the use of various census maps. Thus an appropriate mechanism to continuously update the census maps and maintain an effective dialogue with the potential users should also be established. It should be pointed out that the systematic maintenance and continuous in-office updating of the maps prepared for a census will not only reduce the cost of cartographic work for the subsequent censuses but also ensure availability of more suitable maps for the inter-censal household surveys and other data collection exercises taken up by the national statistical offices as well as other government agencies during the inter-censal phase. Successful utilization of census enumeration maps in conduct of agricultural censuses in several African countries have proved the suitability of these maps for other similar enquiries.

(xi) The use of more recent satellite imagery and other remote sensing materials in updating the existing base maps as well as preparation of appropriate maps for other areas for which the conventional topographic mapping is not available, should also be promoted by upgrading and supplementing the existing cartographic facilities in the census offices coupled with the training of national staff and provision of technical back stopping in the related areas. Such a programme may be taken up by statistical/census offices in collaboration with other interested national agencies in order to share the involved high material costs which the census budget alone may not be able to bear.

(xii) New technologies should be investigated and their potential use in population statistics should be assessed particularly in the fields of laser based mass storage devices, networking, data communication and OMR data entry devices. Recent developments in the field of geographic information system and electronic data processing and management have promised a wider scope for use of computers in the production and

storage of various census maps. The facilities of micro-computers available in most of the census offices can be used effectively, with minimal additional cost for some graphic input and output devices as well as the relevant software, for production of publication maps and charts. The applications of computer assisted census cartography in processing and production of various enumeration maps should also be promoted for efficient and timely production of these maps for future censuses. Countries should be encouraged to use desktop publishing and to build their population data base for better dissemination of their population statistics. Techniques and methods should be studied for de-centralized processing, for data base development, for dissemination and for harmonization of coding and processing.

(xiii) Every effort must be made to complete all aspects of a data collection including publication and dissemination within 4-6 years as otherwise data will get out of date. In no case should new data be collected without fully exploiting previous data.

(xiv) Full documentation of all aspects of a census/survey through an Administrative/Methodology Report is considered useful not only to users but also as a guide for future data collection.

(xv) Integration of all data sources should be ensured and lessons learnt from analysis incorporated in future data collection efforts.

(xvi) In addition to publishing statistical tables, it is useful to include some uses of the data, present summary elementary measures and graphs and charts for ease of comprehension. Also to supplement and complement technical analysis reports, short pamphlets in lucid language bearing on various demographic, socio-economic and environmental aspects will be helpful in the appreciation and fuller understanding of implications of results. Statistical offices also produce large amounts of computer printouts of detailed tables for special analysis. In some cases sample data diskettes are available for research. Financial support should be forthcoming for in - depth analysis as a second phase of data analysis.

(xvii) Statistical organisations should 'sell' their products through wider dissemination and utilisation of their data and by educating the users and the public in general about the importance of the data.

(xviii) Sampling is a useful tool both in data collection and processing. However in data collection, strict adeherence must be ensured and in data entry appropriate weights allocated for blowing up samples. If sampling is resorted to in tabulation due to expediency, the 100% tabulation should not be side tracked.

(xix) Some countries produced data at household level for housing characteristics and few had household dependency and economic activity data also. Since household/family is an important institution, it is suggested that some crucial demographic, socio - economic data be also at household level. This would require attention at data collection and data entry stages for identification purposes.

ANNEX I
LIST OF COUNTRIES: CENSUS DATES AND STATUS OF ANALYSIS/DISSEMINATION
(1982 - 1992)

COUNTRY	CENSUS DATE	ANALYSIS/DISSEMINATION/PUBLICATION STATUS
Algeria	March 1987	
Angola	1983(Luanda Province Only)	
Benin	February 1992	
Botswana	August 1991	Data Processing in progress
Burkina Faso	December 1985	Analysis completed, Dissemination seminar conducted, Report published
Burundi	August 1990	
Cameroon	April 1987	Analysis completed, Some reports published
Cape Verde	June 1990	
Central African Republic	December 1988	Analysis completed, Dissemination seminar planned for July 1992
Comoros	September 1991	
Congo	December 1984	Analysis completed
Cote d'Ivoire	March 1988	Analysis in progress
Djibouti	January 1983	Analysis completed
Egypt	November 1986	Analysis completed, Dissemination seminar conducted, Reports prepared
Equatorial Guinea	July 1983	Analysis completed
Ethiopia	May 1984	Analysis completed, Dissemination seminars conducted, Reports published
Gambia	April 1983	Analysis completed, Reports Published
Ghana	March 1984	Analysis completed, Dissemination seminars conducted, reports prepared
Guinea	February 1983	Analysis completed
Guinea Bissau	December 1991	
Kenya	August 1989	Analysis in progress
Lesotho	April 1986	Analysis completed, Reports published, Seminars planned for July and September 1992

COUNTRY	CENSUS DATE	ANALYSIS/DISSEMINATION/PUBLICATION STATUS
Liberia	February 1984	Analysis in progress
Libya	August 1984	Analysis in progress
Madagascar	June 1991	
Malawi	September 1987	Analysis completed, reports published, seminars held
Mali	April 1987	Analysis completed
Mauritania	April 1988	Analysis in progress
Mauritius	July 1983 and July 1990	1983 census analysed, Reports published. 1990 analysis in progress
Morocco	September 1982	
Namibia	October 1991	Data processing in progress
Niger	May 1988	Analysis completed,Dissemination seminar scheduled for 1992, some reports published
Nigeria	November 1991	Data processing in progress
Rwanda	August 1991	Data processing in progress
Sao Tome & Principe	August 1991	
Senegal	June 1988	Analysis completed
Seychelles	August 1987	Analysis completed
Sierra Leone	December 1985	Analysis completed, seminar conducted
Somalia	November 1986	Analysis in progress
Sudan	February 1983	Analysis completed, Reports published
Swaziland	August 1986	Analysis completed, Dissemination seminar conducted, Reports published
Tanzania	August 1988	Analysis in progress
Togo	November 1991	
Tunisia	March 1984	
Uganda	January 1991	Analysis in progress
Zaire	July 1984	Analysis completed
Zambia	August 1990	Data processing in progress
Zimbabwe	August 1982	Analysis of 10% sample completed,disseminated and published.100% data being analysed

ANNEX II

DEMOGRAPHIC SURVEYS UNDERTAKEN IN AFRICAN COUNTRIES, (1982 - 1991)

COUNTRY	TYPE OF SURVEY	SURVEY DATE, YEAR
Algeria	- Demographic Survey	1986
Benin	- Demographic survey - Fertility Survey	1981-1983 1981-1982
Botswana	- Demographic Survey - Family Health Survey II	1987-1988 August-December 1988
Burundi	- Demographic and Health Survey	March-June 1987
Burkina Faso	- Infant Mortality Survey - Demographic Survey	1981-1982 July-August 1991
Cameroon	- Demographic and Health Survey	April - September 1991
Central African Republic	- Infant Mortality Survey	1984 - 1985
Djibouti	- Inter Censal Demographic Survey	January 1991
Egypt	- Demographic and Health Survey	Oct. 1988- Jan. 1989
Ethiopia	- Demographic Survey - Vital Statistics Survey - The 1990 Family and Fertility Survey	1981-1982 February 1988 May 1990 - Aug. 1990
Ghana	- Demographic and Health Survey	February-June 1988
Kenya	- National Demographic Survey - Demographic and Health Survey	June-December 1983 February-May 1989
Lesotho	- Labour Force Survey - Health and Nutrition Survey	1985/86 1988/89
Liberia	- Demographic and Health Survey - National Demographic Survey	February-July 1986 April-July 1989
Malawi	- Demographic Survey - Family Formation Survey	November 1982 May-July 1984
Mali	- Demographic Survey - Demographic and Health Survey	June-July 1985 March-August 1987
Morocco	- Family Planning, Fertility and Health Survey	April-July 1987
Mozambique	- Demographic Survey	October 1990

COUNTRY	TYPE OF SURVEY	SURVEY DATE, YEAR
Niger	- *Survey on determinants of Fertility and Mortality* - *Survey on the insertion of youth in the production circle*	*1985*
Nigeria	- *Nigeria fertility survey* - *Demographic and Health survey of Ondo state* - *Demographic and Health Survey*	*1981-82* *Sep 1986-Jan 1987* *1990*
Rwanda	- *Fertility survey*	*1983*
Senegal	- *Infant mortality survey* - *Adolescent fertility survey* - *Migration and labour force survey* - *Demographic and health survey*	*1981-84* *1985* *1982* *April-July 1986*
Sudan	- *Demographic and health survey*	*Nov. 1989- May 1990*
Swaziland	- *Demographic survey*	*Nov. 1991*
Tanzania	- *Demographic and Health Survey*	*1991/92*
Togo	- *Infant and child mortality survey* - *Demographic and health survey*	*May-June 1988*
Tunisia	- *Demographic survey* - *Demographic and health survey*	*1985* *June-Oct. 1988*
Uganda	- *Demographic and health survey*	*Sep. 1988- Feb 1989*
Zambia	- *Demographic survey*	*1987*
Zimbabwe	- *Demographic and socio economic survey of the communual lands* - *Demographic and health survey*	*Oct-Nov. 1983* *Sep 1988-Jan 1989*