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**PERSPECTIVES ON CENSUSES OF THE NEW MILLENNIUM \***  
K.E. VAIDYANATHAN \*\*

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# PERSPECTIVES ON CENSUSES OF THE NEW MILLENNIUM

By K.E. VAIDYANATHAN  
CTA, STATISTICAL SYSTEMS PROJECT, SARAJEVO

## I. Strategies for involving stakeholders in census activity

Where there is a constitutional requirement to conduct a census every ten years ( for delimitation of constituencies for election) the commitment of the Government to conduct a census is present. This has been a case in India where there has been an unbroken chain of censuses since 1871. Where such constitutional requirement is not present there is a need for different stakeholders to press for a census every ten years.

The potential stakeholders are:

1. Statistical organizations in the country who will benefit from an expansion of staff and equipment arising from a population census. Significant numbers of staff will be able to upgrade their skills through theoretical and hands-on training. The end result of a census is a statistical system that is capable of designing and implementing quality censuses and household surveys with little or no outside assistance.

2. Policy and decision makers at the national, state (or province) and local levels. At the national level census data are required as a key input in national accounts, estimation of requirements for different commodities and services and for formulating social programmes and interventions. National governments have been using census data for preparing the Poverty Reduction Strategy Paper (PRSP) which is a requirement for assistance from the World Bank. At the State and local level, in addition to the above, the budget, staff and other resource allocations are often based on census figures of population.

3. Non-governmental organizations within each country are among the greatest beneficiaries of population censuses. For example, Chambers of Commerce and Industry, Syndicates and Associations of different trades make use of census data for market research and for informing their clientele about potential business opportunities. National associations in the field of social sciences, population, family planning use the census data for designing, monitoring and evaluation of their activities besides advocacy purposes. Lately, feminist organizations are using census data to buttress their claims for gender equity and justice. For example, in India feminist organizations are using sex-ratio from the census as the basis for questioning the legality of aminocentesis. Universities, research institutes and individual researches are also other stakeholders in census activities for obvious reasons.

4. International organizations like UNDP, UNFPA and World Bank are major Stakeholders. UNDP's Human Development Report and Human Development Indicators ( HDI) draw heavily upon the data and indicators derived from the population census. UNFPA has been a major user of census data from monitoring demographic trends and for preparation of the annual report on State of the Worlds' Population. In addition UNFPA has been using census data for its strategy development and project formulation missions and for advocacy purposes. The World Bank has been using the census data for the preparation of documents relating to poverty alleviation. Since 1996 the World Bank has been supporting a number of LSMS Surveys in developing countries which have drawn heavily upon census data for their sample selection.

In countries where censuses are taken regularly such as India the different stakeholders are involved in the preparations for the census. For example, in India census data users conferences are held to determine the contents of questionnaires and the procedures to be adopted. In addition non-governmental organizations like the Indian Association for the Study of Population (IASP), Universities and even individual researchers act as pressure groups to influence the selection and development of the topics included in the census questionnaire and the approaches to measurement issues. In countries where such pressure groups do not exist (such as many African countries) it may be necessary for international organizations and NGOs to step in and act as pressure groups influencing census taking. The census of China in the late 1970s and many African censuses in the 1960s and 1970s were due to pressure from UN and financial support of UNFPA. There is a need to establish scientific societies (or associations) in the field of population in many African countries, and IUSSP should support the formation of such societies through funding support in the same way IPPF is supporting several family planning Associations. The support may be towards specific activities such as an Annual Seminar on Population publication of a journal establishing a small office for the association etc.. Ultimately, IUSSP may have to seek funds from funding agencies like UNFPA, DFID, USAID or private foundations to provide necessary support to the national associations so that these associations can act as pressure groups for census and other population activities in these countries.

The extent to which the clients demands are met depend upon the resources available, external funding,

technological infrastructure (e.g. Internet facilities), etc., and also the capacity of the clients to pay for the information. The traditional methods of disseminating the information like hard copies of census publications are fast giving way to supply the information by diskettes, CD-ROMs. or E-mail and even posting of information on internet. More and more clients are benefited by the use of modern technology.

## **II. Data Collection Methods – Censuses, Surveys and Administrative Records**

In the large majority of the countries there is no alternative to the population census as the means for establishing the frame for conducting the surveys and fulfilling the administrative needs such as delimiting constituencies for elections. Countries like Netherlands where the population registration system is efficient, a population registration system may appear redundant, but in the absence of the population census there is no basis for determining whether the population registration system is accurate. It is also doubtful if the range of questions asked in the population census can be included in the population registration system. In countries like Bosnia and Herzegovina and Somalia where large-scale population movements have taken place as a result of war there is an urgent need for fresh census. Since no alternative source of data are available the previous census data are being used with adjustments in spite of these data are becoming obsolete. For instance, in Bosnia and Herzegovina the sample for LSMS survey is based on the pre-war survey results with updating of selected municipalities. In Somalia the current estimations of population were derived by the author using the pre-civil war census and survey data with various assumptions concerning fertility, mortality and migration during the war and post-war period.

Yet another application of the census is the “master sample” which is a large number of clusters usually several hundred which are selected by the Statistical Agency after the census and for which updated household listings are maintained in order to select from the pool of households the sample of households to be interviewed in each survey. The advantage of the master sample is that there is no need to select a new set of cluster for each survey or to conduct household listing operation each time. Travel cost can be reduced if interviewers can be selected from the same area

Where census are taken every 10 years there is still necessity to conduct sample survey to obtain the information on current demographic and social statistic. Indeed this is what every developing county is doing. India, for example, has the annual rounds of nation sample surveys to obtain current data and to compliment the information obtained from the decennial census. In many developing countries administrative records are incomplete and inaccurate and cannot be regarded as a substitute for censuses, moreover the information provided by the administrative records are not necessarily the same as those obtained from census. Administrative records can serve different purpose, namely, to monitor the performance of the provider of the administration, and only incidentally they provide statistical information.

## **III Adapting the Technologies to Census Operations**

The technology of census has come a long way from the stage when manual counting of census slips was done (e.g. in the Indian censuses up to 1961) to the use of the unit record equipment, then the large first generation computers, and now to the use of personal computers and laptop computers. The march of technology cannot be stopped and census takers need to keep pace with these changes. The following are areas where new technologies could be adopted to census operation in the planning, execution, tabulation and dissemination stages.

### **(1) Use of Mass Media**

Since information pertaining to the census should reach the entire population, media coverage is important. The census administrator should use all available technologies to inform the public about this census and this would include radio, Internet, e-mails etc.

### **(2) Questionnaire Layout**

Assuming that the conceptual structure of the census questionnaire (including modules on fertility, labor, or migration) is well thought out, technology can play a great role in proper format of the questionnaire. A good format minimizes the error during the interviewing and subsequent data entry., thus improving data quality and timeliness of the availability of data. In my view only one questionnaire should be used for each household. In some countries, such as India, the census questionnaire has two parts – a household questionnaire and individual slip. Unless proper identity codes are included in all questionnaires separate questionnaires create the risk of improper matching. A grid may be required in cases where there is more than one unit of analysis in a household- for example, several eligible women for fertility module, several employed person in labor module. etc. The EXCEL software is very helpful in

proper formatting of the questionnaires. Other word processing and graphic software packages can also be used for producing questionnaire layout. Revisions of the drafts can be made more easily with the help of this software. The computerized approach to translations enables the overwriting of the verbal parts of the questionnaires can be re-written in the local languages leaving skip codes, response codes and the general format unchanged.

### **(3) *Refining Logistics***

The logistics of the population census can be mind boggling from the stage of the questionnaires, printing of questionnaires, distribution of the questionnaires, collection of the questionnaires for the data processing, data entry and processing and storage of the questionnaires. All these activities require thorough planning. Equally important is the selection of the interviewers, their training and deployment and monitoring of their e field work. Communication between the census administrator and field units and between the interviewers and supervisors can be improved through the use of cell phones and e-mail communication. Video conferencing can be used for training inteterviewrs in different locations ensuring uniformity of training. The data collected in the field can be entered into computer through the use of laptop computers and transmitted to the data processing unit through e-mail. Use of new technologies involve additional costs and one should consider the trade-offs between cost and time while deciding the use of such technologies.

### **(4) *Data Entry***

Commercially produced data entry packages have fast superseded customized data entry programmes adopted in earlier censuses.. The Sudan census in 1993 produced all the results within two years after the census because of the use of IMPS software developed by the US Bureau of Census. Other similar software like Blaise, ISSA, EPI-INFO can be used but each have their limitations. Software developments are occurring rapidly and there will be other software packages available soon meeting the needs of the new round of censuses. For example, the new software CPro combines the features of IMPS and ISSA. Concurrent data entry makes it possible to use it in a pilot census or in the first month of the population census to gain insights into the quality of the work enabling the improvement of the training and ensuring better control of the field work. However the use of this software has not been tested in a census. Eventually with advances in the computer technology, enumerators will be able to enter data directly into the portable laptop computer during the interview thus eliminating paper questionnaires completely. This will require a totally new approach to questionnaires design, organization of the field work, system of the quality control and management of data.

### **(5) *Data Management and Dissemination***

Every change in technology, for example, improved data entry programmes, portable hardware and computer assisted interviewing will have implication for data management and dissemination. For example, with new data entry programmes the data manager has to ensure that the household data files prepared by different data entry operators are included without duplication or omission and convert the large number of households based files into a few thematic files. A master version of the files may be maintained in ASCII, but it may be necessary to convert then into other formats to facilitate their use by data users who use different software packages such as SPSS, SAS, STATA, etc. In should be ensured that the different thematic files can be matched and merged for further analysis. The data manager should take note of the current trends in handling this task.

The traditional method of dissemination of data through hard copies of census data will need to be maintained since the large majority of users still do not have the access to computers, internet, etc. At the same time developing countries need to adopt the new technologies of dissemination such as internet, e-mail etc. side by side. They should also use software for mapping and graphics for better presentation of the information.

## **IV. Maintaining Census Related Activity in the Inter-censal Years**

The following census related activities may be undertaken during the intercensal period.

### **(1) *Establish the Master Sample of the Enumeration Areas***

A master sample is a large number of clusters of households which are selected by the statistical agency following the census and for which updated household listings are maintained. From these samples of households sub-samples of households are selected for each survey. The master sample should be available for each analytical domain or sub-groups of population – rural, urban, provinces or regions, etc, for which information is required. These master samples should be updated every two years or prior to the implementation of a survey.

## **(2) *In-depth Analysis of Data***

Soon after the census only the essential tabulation required by the analysts and policy makers are produced in the form of an abstract. This will typically include the frequency tables of the various variables covered in the census according to the selected socio-economic groups and analytical domains. Further in-depth analysis of the data is necessary to establish relationships between different variables and for studying changes during inter-census period.

## **(3) *Undertaking Demographic and Social Surveys***

Following the census the Statistics Agency could undertake sample surveys to obtain information on current demographic and social indicators. Examples of such surveys are the World Fertility Survey, Demographic and Health Surveys, Living Standards Measurement Study etc.

## **(4) *Establishment of Information System***

Using the census data as the basis an information system can be established providing key socio-economic indicators and this must be updated annually using information available from sample surveys, administrative records, and estimations based on the census.

## **(5) *Preparation for the Next Census***

Preparations for the next census normally requires two years prior the date of the census. This would include house listing operation, preparation of census maps, preparation of the questionnaire and pre-testing it, and selection and training of interviewers and getting all the logistics of the census organized. In the past census organizations were similar to the proverbial phoenix which arises from the ashes. This was a case in India with the census organization up to the Fifties. However, it was found necessary to have a permanent institution of Census Commissioner and Registrar General with a core staff on a permanent basis. At the state level the office of the Director of Census Operations is also maintained with a core staff of census statisticians and computer personnel. However, the large body of staff – enumerators, supervisors, data entry operators etc are recruited prior to the census and disbanded soon after the census. The census organization in India is separate from the Central Statistical Organization and National Sample Survey. When census taking is a responsibility of the statistical agency, the staff of the agency serves as census planners and administrators. This is the only practical way continuity and institutional memory of the earlier census can be retained and utilized in later censuses. In some countries (like Iraq) census records are stored for a long time as a reference material for the administrative purposes (e.g. for purchasing property in Baghdad the persons should be enumerated in the earlier census). There are countries which keep their records for ten years and then discard them. With the advance of computers census records can be stored in the CD-ROMs, Diskettes, Bernoulli boxes, etc and they can be retrieved anytime.

## **V Identification and Resolving Problems of Census Mapping**

This is the weakest area in the preparation for the census in every developing country and needs to be addressed. There are two kinds of problems – maps may not be available or missing due to the war, mishandling, etc. Secondly, maps may be available but are incorrect due to changes in boundaries, construction of new dwelling units, factories, etc, or changes in street names, street numbers or numbers of buildings. This is particularly significant in urban areas which undergo change due to annexation of rural area or re-drawing of boundaries between the areas within the locality. It is necessary to strengthen the cadastral and mapping authorities to carry out revisions of maps on a regular basis at least once every five years. These maps should be secured by the census authorities during the house listing operation and further updated based on the information obtained during the house listing operation.

## **VI Post-enumeration Surveys: Are They Worth It?**

In most developing countries the PES, in the manner it is done at present serves as means of self-assurance rather as means for correcting the data. Countries are able to boast that their censuses are 99.5 percent complete and so on, but hardly anything is done to correct the data. This is not the case in developed countries like USA and Canada where the corrections to census data are carried out using PES results. There is a need to change the concept of PES from the means to correct the data to the means of informing the analyst about the pitfalls in the data, so that the analysts can apply their own corrections. The PES should be focused on identifying the coverage and content errors in key variables like rural/urban population, employment and unemployment, gender, children ever-born/surviving,

occupation, school enrollment, etc. This would help the analyst to look at the data more closely rather than drawing erroneous conclusions. There is a need to thoroughly re-examine the concept and methodology of PES to make it useful to identify problems in the census that are often overlooked and have a consequent impact on the census results.