



Challenges of 2001 Census in India and future issues

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Introduction

At the 2001 Census, India counted 1028 million persons in 193 million households living in about 6 hundred thousand villages and more than 5 thousand towns. Prior to the conduct of the population enumeration during 9-28 February 2001, the house listing operations was undertaken during April – November 2000 to prepare a systematic frame for the carrying out the population enumeration and alongwith collect data on housing, household amenities and assets. An army of about 2 million field workers, mainly schoolteachers, were deployed to accomplish these tasks. The questionnaire for the 2001 Census was printed and canvassed in 16 languages including English. The multi-ethnic, multi-cultural and multi-linguistic fabric of the Indian population together with its large size makes the Indian Census as one of the most unique and at the same time challenging administrative task. In the next Census, nearly 1200 million persons will have to be enumerated. These complexities will continue to remain.

Challenges in 2001 Census

Quite conceivably, the conduct of census of large size and processing of a large volume of data pose huge organizational and logistic challenges. The 2001 Census was not an exception. These challenges were, however, overcome through several administrative, technical and technological innovations. The core to the success of this exercise was the utilization of a well-evolved administrative structure running right up to the lowest geographical unit and close coordination between the central and state governments. The Census Act, 1948, provides for setting up of a census hierarchy within the state administration and lays down their duties and responsibilities. While the Census Commissioner's Office is responsible for strategic planning, finalization of data items, drafting of instruction manual, preparation of standard training module, defining processes and procedures etc., the execution is done in the states by the respective Directorates of Census Operations (which is a field unit of the Census Commissioner's Office) through the state census hierarchy.

Some of the major challenges are discussed in succeeding paras.

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Preparation of geographical frame

As a part of the preparatory work, the first exercise that Census Organization has to undertake is the finalization of the geographical frame. One of the major problems in finalizing the geographical frame is its dynamic nature. The jurisdiction of geographical entities at different levels changes. There is no single organization in the country, which keeps track of it or systematically maintains an updated list of districts, sub-districts, villages and towns. Therefore, prior to each census a list of villages and towns is prepared *de-novo*. This information is collected from the field. Each of the entities is given a location code for use in the field and for processing of data. In order to carry out this exercise smoothly the states are advised to freeze all geographical boundaries one year prior to the houselisting operations. For 2001 Census, the boundaries were frozen as on 1.1.2000. Despite that, after the Houselisting Operations, Government of India created three states throwing the code list into disarray.

Uptil 1991 Census, a hierarchical coding system was followed, in which each administrative unit was coded within the next administrative unit serially and systematically following a geographical order. But frequent changes in the geographical jurisdictions, render the geographical code in one census unusable in the next census. The coding of geographical entities had to be done afresh in census. In the 2001 Census, the problem has been got over in the rural areas by assigning a Permanent Location Code Number (PLCN) to each village within the state. Each village has been assigned an eight-digit code. First six digits represent the code of the village as existing at the present census and the last two digits being '00' are kept for accommodating future changes arising out of administrative decisions. For example, if a state has 5438 villages the first village falling in the sub-district of the first district will have a code 00000100 and the last village in the last sub-district of the last district will have code 000543800. The new code structure will help resolve the problem of coding and will help ensure the comparability of data at the village and other administrative levels in time series.

Formation and identification of slum enumeration blocks

Rapid urbanization coupled with industrialization and growth of commercial centres, has led to emergence of slums. These are urban areas of human habitation, but are characterized by lack of adequate lighting, safe drinking water, absence of toilet facilities and non-availability of basic social and health services. Slum enumeration blocks were identified for the first time in 2001 census in each municipal town having population of 50,000 and above. This has helped in generating a count of the population living in slums for which estimates were available so far.

Appointment of enumerators

Hiring of 2 million enumerators across the country is one of the most challenging tasks. The enumerators are mainly government employees and a large majority are schoolteachers. They are drafted on part time basis and

have to perform census duties in addition to their normal duties. Since annual school examinations are held about the same time, the teachers are under a lot of pressure. At places, there was resistance from the teachers as well as from the Education Departments in making them available for the census work. At times, it led to litigations. Finally, this was overcome through persuasion, taking a lot of precious time of the census organization.

Training

An essential prerequisite of training is clear and unambiguous instructions to all the field functionaries and Census managers. The challenge lies in preparing detailed instruction manual explaining the concepts, definition and rationale of each of the information to be collected. Training has more importance in the Indian scenario due to low literacy level among the respondents, which, at times, results in incomplete and inadequate response. It becomes the responsibility of the enumerator then to elicit correct information. Further, the manual had to be translated in seventeen languages for better comprehension of the enumerators. No country in the world perhaps conducts census in so many languages. Three rounds of training of two million enumerators across the country at sub-district levels were organized. Organising training in batches of 70-80 participants within a short time, was a daunting task. Different methods of training from traditional black board chalk to power point presentation were used depending on the local situation. A well-equipped team of Master Trainers was created which was deployed for training of enumerators for the first time in 2001 Census. These Master trainers were mainly drawn from among the experienced Lecturers, Principals and other government officials with good oratory and training skills. They were trained intensively at the state and district level. Experienced census officers from the headquarters were also deputed as observers in these training programmes.

Census Help Lines

An important innovation in 2001 Census, was establishing of Census Help Centres and Help Lines/Telephone Help Lines. These provided timely technical assistance to the enumerators at the time actual enumeration and, subsequently, to the public to register complaints in case they were not enumerated. Sincere and honest efforts were made to follow up each of the individual complaints, at times on the spot, which helped in improving the coverage.

Publicity

An intensive and extensive publicity campaign was undertaken to enhance the awareness about the census and for seeking cooperation of the people. The campaign focused on allaying the fears that the information provided would not be kept confidential as required under the law. Mass media such as newspapers, radio, television, cable network, postal stationery etc. were used extensively to propagate census messages. Specific appeals were made by the celebrities, especially on TV, seeking cooperation of the people in the

census. The enumeration of dignitaries such as the President, the Prime Minister, the Vice President etc. on the first day of the census was the headlines in most of the leading dailies and other media. In addition, posters were displayed, pamphlets distributed and banners put at important places. Publicity was also conducted through participation in fairs and exhibition and organization of children rallies. A Census quiz contest was held daily on the Census Website for six months until 28th February. A Census Logo (see top of the first page) was adopted to provide a face and identity to the 2001 Census.

Engendering the Census

One of the major criticisms of the Indian Census has been that it didn't capture the women's' economic activity. Therefore, an aggressive and pragmatic gender sensitization strategy was adopted to net women's economic activity, particularly, of those in unorganized sector. Definition of 'work' was expanded and unpaid work in milching or milk production were included as 'work'. A special chapter was incorporated in the instruction manual of enumerators on women's work which included 32 sketches of unpaid and paid work done by them, which generally remained unreported. This greatly helped and the enumerators made efforts to net women's economic activity with care. A list of critical districts that had low female work participation rate and low female literacy rate in 1991 was prepared. Special efforts were made in training of enumerators in these districts through Census Advisors. The UNFPA, UNICEF and UNIFEM provided support for this activity. The concerted efforts made resulted in a fair degree of success in capturing of women's work. For instance, in Punjab state which recorded inordinately low FWPR of 4.4 per cent in 1991 Census, recorded 19.1 per cent FWPR in 2001.

Design and printing of forms

The census was required to be conducted in 16 languages. The form had to be then designed and printed in as many languages. Since the forms had to be scanned later for processing, accordingly all questions in a single A-3 size sheet by using one single template was a difficult task. The description of items in the column headings had to be fitted into the space provided, ensuring that it conveyed the exact meaning as was intended. This was a challenging job that was executed in-house. Designing of Urdu form posed a major challenge.

Printing and distribution of forms was again a major organizational challenge. Nearly 7000 metric tones of paper was procured and moved to a number of printing presses across the country for printing census forms. Distribution of forms and reaching them to 2 million enumerators in 6 hundred thousand villages and 5161 towns within the specified time, was a challenge which was met through meticulous planning.

Inventory Control

Inventory control of forms starting from the time it is delivered to the enumerators finally when it is taken back, was a key element in the process control of census. Filled in forms had to flow from about 2 million enumerators through several levels to the 15 data centres for scanning and processing. A rigorous inventory control system was put in place to ensure that not a single form was lost or misplaced. For keeping the forms in good and clean condition, the forms of one Enumerators Block (EB) were placed in a plastic packet by the enumerators; supervisors placed packets of all Enumerators Blocks in a cardboard box before submitting them to the Directorate of Census. The Directorates verified the number of each EB before accepting them. It may be pertinent to mention that missing of one form on the average could result in a reduction of a population of five persons, which effectively would mean a loss of 6 to 8 percent of the population in the EB.

Processing of data

A quantum leap was made on the technology front for processing the 2001 Census data both for the Houselisting and Population Enumeration. The Schedules of both the phases, were scanned through high speed scanners in 15 (fifteen) data centres across the country and hand-written data from the schedules were converted into digitized form through Intelligent Character Reading (ICR) Software for creation of ASCII records for further processing. The selection of the technology and decision to take a plunge into it despite the fact the census organization of many counties had not attempted it, was a crucial risk taken by the country. But through a strong monitoring mechanism at the national level, all the data centres functioned with minimum down time. About 202 million forms consisting of about 1028 records were scanned and processed within a span of only 10 months starting from October 2002. Since the output was dependent on the quality and performance of the ICR software, tying up of the front end Integrator with hardware and software partners ensured a single point responsibility. Single point control with the Integrator and productivity linked payment ensured that goods were delivered in time while ensuring that the Integrator played a crucial role in assuring the quality of images and ICR performance. Further, the payment was subject to ensuring more than 90 percent recognition and less than 2 percent false positive. The project management including operational management was within the organization while the Integrator was to extend support services for ensuring smooth operations. The contract bound the Integrator until the end of the project through a payment terms, which allowed payment of the total contract value of the project to the vendor on a quarterly based on performance.

The use of the technology has benefited in several ways

- a) Resulted in a savings of Rs. 6000 million Indian Rupees (equivalent 150 million USD).
- b) Made it possible to produce all tables on hundred percent basis.

- c) Scanned images of all the forms became available which will be used for undertaking methodological studies such as variation in response by age and sex of respondent, by sex of enumerator, listing of common Indian names etc.
- d) Scanned images can be preserved for a much longer period of time even after the paper forms are destroyed.

Data dissemination and utilization of census data

Unlike in the past census, data dissemination has been taken up as a major activity in the 2001 Census. A very aggressive and pro-active strategy has been adopted for disseminating the 2001 Census data. In view of the widespread use of personal computer across the country, it has been possible to quickly release the data in electronic format and make it available to various stakeholders. While releasing every major datasets, a sensitizing programme is undertaken for publicizing the release and making available highlights through workshops and seminars. Dissemination is not limited to national or state headquarters levels but has been taken to district and sub-district level as well. Census results are being made visible through participation in book fairs and exhibitions, Internet and through other media. A National Census Data Users Survey has been commissioned to elicit the views of the data users in the availability and format of presentation of census data and steps for improvement in these fields.

The census data is being widely used for policy formulation and planning both at the central and state level. The private sector has emerged as an important user of census data. Demand for customized tabulations is on the increase. The work of delimitation of electoral constituencies is in progress based on 2001 Census population.

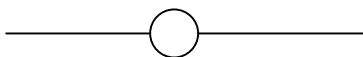
Future issues

The major issues which are likely to be faced in future and the steps envisaged to tackle them prior to the next round of census, are as under:

- a) The maps of enumeration blocks are hand drawn by the enumerators themselves for their assigned area of work. This results in omission or duplication of areas, especially, in certain urban areas. It is contemplated to undertake pre-census mapping work starting from the large towns. Mapping of EB maps (which generally would have population of 600 to 800) with permanent boundaries and landmarks may not be feasible in most cases. An exercise has begun on experimental basis to demarcate larger geographical areas having a population of 5000 to 6000 in a few large towns and prepare maps for these areas. These will be used as supervisory circles in the urban areas in the next census.
- b) The rural and urban frame is prepared afresh prior to every census. This is a painstaking task. Action has been initiated to update 2001 Census frame at specified intervals to take into account intermediate jurisdictional changes. The introduction of Permanent Location Code

Numbers in rural areas in the 2001 Census will greatly facilitate this task.

- c) In view of an increasing resistance among the government employees and schoolteachers for taking up census work, other options may have to be explored. The possibility of working through NGOs or of employing students is being thought of as alternative.
- d) The Census 2001 has successfully used the latest technology in data processing and data dissemination. Similar attempt has not been made to use technology in data collection, which essentially means use of hand held data entry equipments. The scale of operation does not favour such an arrangement. Moreover, these equipments will be of no use after the census fieldwork. These can yet be considered for use if the unit cost of such equipments comes below the current threshold limit. It may be advisable to use them selectively first and limit it to urban areas. This will reduce the hassle of printing and delivery of forms and data entry.
- e) Many of the countries have been canvassing two types of forms in the Census - a short form for the complete population, and a long form for a selected number of households/individuals. In India, the practice has been to canvass a long form for all the individuals. This was done even when the resources did not permit processing of 100 percent data. Sampling was resorted to for processing of several data items. This in a way meant wastage of resources in collecting the data. One of the options that need to be debated is to resort to a short and long form approach. This would, no doubt, require a scientific selection of households or individuals in each EB, a process that is not easy to administer in the field. It is proposed to carry out a methodological study during the inter-censal period on this aspect.
- f) The Government of India is contemplating an Electronic Identity Card (EID) Project in the country in future. The project envisages creation of a National Population Registry (NPR), allotment of unique National Identity Number (NIN) to every individual and providing EIC to each person. The NPR will be updated on a continuous basis by linking it to registration of births and deaths. The census taking in 2011 shall have a close bearing on the success of this project.



Annexure

Census of India, 2001: Main results

Item	Persons	Males	Females
Population*	1,028,737,436	532,223,090	496,514,346
Growth rate ⁺ (1991-2001)	21.54	21.14	21.97
Proportion of population by religious community			
Hindus	80.5	80.6	80.3
Muslims	13.4	13.4	13.5
Christians	2.3	2.3	2.4
Sikhs	1.9	1.9	1.8
Buddhists	0.8	0.8	0.8
Jains	0.4	0.4	0.4
Other religious communities	0.6	0.6	0.7
Religion not stated	0.1	0.1	0.1
Proportion of :			
Scheduled Castes Population	16.2	16.2	16.2
Scheduled Tribes Population	8.2	8.0	8.4
Proportion of population by broad age-groups			
0-14	35.3	35.6	35.1
15-34	33.8	33.7	33.9
35-59	23.1	23.3	22.9
60+	7.4	7.1	7.8
Age not stated	0.3	0.3	0.2
Sex-ratio[#] of total population			933
Child Sex-ratio[#] (0-6 years)			927
Literacy rate^{##}	64.8	75.2	53.7
Work participation rate	39.1	51.7	25.6

Notes:* Includes estimated population of Mao Maram, Paomata and Purul sub-divisions of Senapati district of Manipur. Such population excluding Mao Maram, Paomata and Purul sub-divisions is 1,028,610,328 for Persons, 532,156,772 for Males and 496,453,556 for Females.

+ The 1991 population figures for India used for working growth rate 1991-2001 includes the interpolated figures for Jammu & Kashmir as no Census was conducted there in 1991.

Sex ratio has been worked out as number of females per thousand males.

Literacy rate has been defined as the percentage of literates to total population aged 7 years and above.