

- Population registers

2.1 Population Census

دائری ۱۶۰

2.1.1 Scope of census data

Census aims at complete coverage of population; this characteristic is termed as *Universality*, although sometimes an element of sampling intrudes, with some respondents being asked broader range questions than other. Information is sought about each individual present within a defined geographic area at well defined point in time (*Simultaneity*), with some attempt perhaps also being made to obtain data on persons usually resident in the area but temporarily absent from it at that time. The questionnaire are prepared and asked to whole of population with uniformly trained enumerators under one administrative control, therefore census data is usually uniform. Complete coverage also means that detailed cross tabulation can be prepared which are not subjected to any errors. Moreover, for the events and elements that are not asked universally the size of the sample invariably so large that the estimation is subjected to very low sampling errors. Population censuses are the primary sources of denominators required for estimation of demographic rates and ratios. Countries with reliable vital registration system can optimally exploit vital events statistics without regular censuses. For many demographic indices computation of a numerator comes from a vital register with population at risk as denominator from a census. Often these indices are estimated by using survey data as the survey yielding both numerator and denominator. But during census year the ideal is that the survey data should be combined with appropriate census data. For the census year census populations may be used as denominator perhaps with small adjustment depending upon the timing of the census during the year. For other years denominator normally may have a census based adjustments with vital and other (migration) events that have modified to that base in the interim.

2.1.2 History of Census Taking

Islamic

Census taking is an established institution in Pakistan and even in Indo-Pak subcontinent. The first census was conducted, in the area now comprising Pakistan, in 1855, second in 1868 and third in 1881ⁱⁱ. The first two censuses of 1855 and 1868 concerned administrative divisions so different that any comparison with these was out of the question. The enumeration of the 1881 Census was carried out on a scientific basis and since then the census has been carried out regularly and systematically after every ten year. The exception was 1972 and 1998 Censuses, which were due in 1971 and 1991 respectively.

Before 1941 Census information recorded on household schedules were transcribed first on 'Individual Slips' for further processing the data. That transcription method alone sometime took nearly a year, which caused delay in releasing census results. In 1941 Mr. Yeats, the then Census Commissioner changed the method of recording census information. He introduced 'Individual Slip' for enumeration purpose rather than 'Household Schedule', which saved time of transcription and ensured possibility of sorting of the same information collected from the field. This practice continued up to the 1961 Census. Thereafter, because of replacement of hand sorting and punching with computer hardware the 'Household Schedule' once again replaced the 'Individual slip'. This permitted direct entry of all individuals from Household Schedule to computer input device by keying the information.

This conventional system of data entry has now been replaced by scanning of information from 'Household Schedule' to computer input device, which allows maintaining of very high accuracy (may be 100 percent if the questionnaire sheets meet fully the data scanning requirements) in data entry in minimum possible time. Thus, the present set up has become more cost-effective and time saver.

Census is a total process of collecting, compiling, processing, analyzing and presenting data pertaining to all individuals living in a well-defined territory or a part thereof at one point of time with regular interval. From the above definition it is clear that census has four main features i.e. simultaneity, individuality, universality and periodicity. These will be examined here in the light of the censuses ever taken in Pakistan since its inception.

2.1.3 Census Methodology

Census activities are time bound; delay in any activity is likely to disturb the whole operation, therefore, adherence to time schedule is extremely essential in census taking or census operations. Census activities can be divided into three broad groups:

- Pre-enumeration activities or census planning
- Enumeration and
- Post enumeration

I) Pre-enumeration Activities/ Census Planning

Census planning in fact starts from the date of approval of census taking by the cabinet. This normally accorded almost $\frac{2}{3}$ years prior the census date. Pre-census activities include approval of census date, users consultation, questionnaire development and designing, assessment of logistic requirement and procurement, pre-testing of questionnaires and pilot census, preparation and printing of manuals and other census documents, delineation and delimitation of census areas, preparation and reproduction of census area maps, raising of field staff, data processing and plans relating to tabulation, edit/imputation, publicity, distribution and retrieval of documents and publication.

Delimitation and mapping work

Two activities take place or initiate simultaneously viz updating of geographic work on one side and development of census questionnaire on the other. Geographic work comprises delimitation and delineation of census areas by making physical visit in the entire country, preparation of maps, reproduction of maps and cartographic work. For the fifth census the delimitation was carried out by the low paid revenue staff of respective provincial governments. In urban areas the task was done by the staff of the local bodies like municipalities, town committees and in cantonments by the staff of the local bodies and Directorate of Military Lands Record.

The entire country was divided into urban rural domains. In rural domain rural areas of an administrative district, including town committees, were declared as rural census district while cantonments, howsoever small, as independent census district. Rural census districts were further divided into *tehsil* or subdivision known as census charges which were divided into *Qanoongo Helqa* called as census circle, further divided into *Petwar* Circles called as census circles which were finally divided into small areas generally comprising 200-250 households or 1000-1500 persons known as census blocks. In urban domain urban census districts were divided into small areas of 200-250 households or 1000-1500 persons also known as census blocks. About 5-7 contiguous blocks merged together to form census circle, 5-7 census circles to form census charge and census charges combine together known as census district. Town committees and

other small urban areas were considered as census charges which were further divided into census blocks of comparable size with other larger urban areas. Maps of Census district were prepared with the assistance of DC staff in case of rural census district, by staff of municipality in case of local government and by staff of Cantonment Boards in case of cantonments showing boundaries of census charges and therein boundaries of census circles. Separate maps were prepared for each census circle showing boundaries of census blocks. On delineation of boundaries of census areas detail description of block boundaries, circle boundaries, charge boundaries were also prepared.

Apart from delimitation sketch maps of census blocks and census circles were prepared while actual separate maps of census district were either procured or prepared with the assistance of the respective office showing scale and direction of census charges. Similar activities for delimitation and preparation of maps were also concurrently carried out by the staff of municipalities, town committees and cantonment boards in case of urban areas.

On finalization of delimitation each census block, census circle, census charge, census district were assigned independent codes. Generally, a census block comprises three digit code, census circle, census charge and census district each are assigned two digit codes making a nine digit unique code for each census block.

Development and designing of census questionnaires

All census users comprising federal ministries/divisions, provincial government, research organizations, important universities dealing with the population or demography and NGOs are generally consulted through correspondent to know and appreciate their expectation from census taking. Then on receipt and examination of user's demand they are provided an opportunity to discuss their expectation with the experts of the census organization. Their genuine demands are normally accepted while for demand not relating to population they are just guided to consult the concern ministry dealing with the subject. Then user's demands are converted and given the shape of questions. After converting their demand into questionnaire then sorting of questions is done by the census experts. The most common and core questions are given preference to place in the beginning of questionnaires while sensitive, difficult and questions demanding detailed probing are usually placed at the end of the questionnaire normally such questions are asked through a sampling inquiry to supplement the main census information. (Census questionnaires both complete count and sample count are appended at the end of this book). While designing questionnaire language of the individual questions is given top priority as ambiguous, unclear and incomplete questions are likely to provide deficient/ inaccurate information. Also to assign importance to the respondent utmost care is taken to skipping patterns so that no irrelevant question should be incurred from any respondent.

Pre-testing and Pilot Census

Three pretests are carried out: The first by the census people who developed and designed the questionnaires and pretest is confined to in and around twin city of Islamabad and Rawalpindi. The objective of this pretest was to see the adequacy with respect to questions' language, and clarity in concepts/definitions. The second pretest was carried out concurrently by the census staff and field staff. Both teams are given required training before sending them into the field. The field work is done in and around twin city of Islamabad and Rawalpindi and four provincial capitals on random sample basis. The objective of this pretest was to see the difference in

performance of these two teams and underlying causes. The third pretest was carried out by the field staff alone under actual field conditions on a small sample basis randomly selected representing the whole country. The objective of this pretest was to finalize the questionnaires. In these entire pretests interview is recorded on cassettes along with observations of interviewers that helped a lot in reviewing the questionnaires.

Pilot census, aiming at to examine the adequacy of all census activities to be performed till the release of last publication, is carried out on nationally representative sample and all steps are re-examined for ensuring adequacy of the proposed planning of census.

Raising of field staff

The third important pre-census activity is raising of field staff like enumerators, circle supervisors, charge superintendents and census district officers. The quality of census fieldwork largely depends upon the skill, experience, qualification, caliber, sense of responsibility, etc. of staff engaged for collection of information from households. At federal level the organization responsible of census taking generally comprises skeleton staff for planning, monitoring and overall supervision. The field staffs are deputed with the assistance of the respective provincial government and Directorate of Military Lands Record, General Headquarters, Rawalpindi. To be on safe side 10% additional field staff is raised as reserved force for meeting any emergent need. The enumerators were mostly the primary school teachers, junior *patwaris* and office clerks having at least matriculation qualification. Their supervisors were senior school teachers, senior *patwaris* and other revenue officials and staff of the respective cantonments. For sample inquiry, preference was given to those having past experience in conducting census fieldwork and conforms to the quiz test given to them. At each block generally one enumerator is required for door to door enumeration during the census field operation. However their immediate supervisors are authorized to depute additional enumerators depending upon the size of the block or in case of any emergency he can replace the enumerator on job with the consultation of his respective supervisor.

Logistic requirement

Based on the last census information and other current population surveys expected population is estimated to formulate a base for logistic requirement. After working out all logistic requirements like number of questionnaires required for census operation, supporting items for filling up the questionnaire, transportation, dispatching and retrieval of documents 15% are kept as reserved stock. Then the census field use material is procured/ purchased or printed at least 2 months ahead of the census operation.

II. Enumeration

Enumeration stage covers training of field staff, distribution and retrieval of census documents, door to door canvassing, supervision, monitoring and establishment of control rooms.

Training of Field Staff

Training of field staff, comprising enumerators, circle supervisors and charge superintendents, is imparted in batches of approximately thirty trainees each. For complete count three days training is given to each batch and for sample count six days training. At the end of each session trainees are required to make field visit for filling in the forms themselves. These filled in forms are discussed in the class for rectification of errors committed by them. The entire training

programme lasted for one month. Left over trainees is provided an opportunity in the next week to get training. In this way 100 percent, including reserve, field staff got training just before the census operation.

Respondents are educated for eliciting their cooperation by passing on census messages through various publicity media like TV, radio, newspapers etc. The publicity campaign, is restricted to the limited funds available for the purpose thus it was not so effective as to motivate respondents to provide updated an accurate information about individuals living together in any housing unit.

For training purpose four master trainers are trained at Population Census Organization (PCO) headquarters, Islamabad. They trained approximately 260 trainers, including armed forces personnel, at four provincial capital cities. Then those trainers imparted training to their respective field staff at different venues mostly located at district headquarters but in some cases at sub-divisional headquarters or in cantonments depending upon the concentration of population in any area. There are more than 1000 venues where training of field staff is given. The training included class room work as well as field work. At the end of the field work their field performance is examined and deficiencies if any, explained to them by their respective trainers for rectification of errors committed by them in the field while filling in the questionnaires and further clarified the different concepts un-cleared to them. Face to face training is imparted. However one day is reserved for field work and one day for examination of their field performance, general discussion and question/answer. For maintaining uniformity in giving census messages concepts/definitions are also displayed on television at all training venues during every session followed by question/answer. The training materials included some filled in and some blank questionnaires, carbonated lead pencil, eraser, sharpener, water proof a tyvic envelope, a note pad and a rexine bag.

Training was closely supervised by the senior staff of PCO, other qualified statisticians available in the country at the time of census operation and army officers in case of soldiers. Because of five times postponement of census date training was imparted five times to the entire field staff and supervisory staff. Due to either retirement, or transfer or death of members of civilian field staff each time their replacement rate was around 5 percent. So at least 75 percent of them received training five times, another 5 percent got training four times and so on and hardly 5 percent got only one time training. Thus, preponderance of civilian trainees was well acquainted with definitions with quite clear concepts and well aware what to do in field for collection of information as per census questionnaires. Since armed forces personnel are associated in last attempt thus they received training one time only.

Despite the above training inputs the quality of census return can be further improved if interview proceedings are recorded on some display media for reviewing the training methods on the basis of deficiencies detected from such record. Besides, there is a need of realizing to the field staff, through training, the importance of collection of correct information in socio-economic planning at various levels and their own welfare being members of the beneficiary society. Recording of correct age may be given high priority in training of field staff. Art of recording age with the help of historical events, ages of other family members, personal particulars such as educational level achieved, years of schooling, age of entry into school etc should be emphasis in the training.

The experience has shown that generally the enumerators, who were invariably males, felt shy in seeking detailed information from respondents who were predominantly females as during interview hours most of the male members remain away from the household for earning their

livelihood. Their shyness might have affected the response information especially relating to fertility, disability and economic characteristics of individuals. Besides, in most of the cases since one respondent was answering the questions asked by the enumerator/interviewer, therefore, the reliability of the information provided by him/her to a greater extent depended upon the knowledge of that person about the members of the household. In the first four attempts trainees participation rate was never exceeded 98 percent but in last attempt the rate approached almost to 100 percent mainly due to assistance of armed forces. This subsequently ensured full coverage of the country's area in census operation.

Distribution and Retrieval of Documents

Field use material is dispatch to the concern district officers in form of kits according to their actual requirement plus 10% surplus while 5% surplus is kept at census headquarters and in its provincial offices. The census district officers are given clear-cut instructions to distribute the material in the form of kits to census charge superintendents according to their requirement with 7% surplus. The charge superintendents are required to distribute the census material to circle supervisors again in the form of kits according to their requirement plus 5% reserve. While the circle supervisors are directed to distribute census material further to the enumerators according to the actual day to day requirement and to keep the remaining in reserve with them for meeting any emergent need.

During retrieval process census filled in documents are sealed at each step from an enumerator to census district officer and then these documents are taken to the census headquarters accompanying by special escort of armed forces. On receiving at the headquarters these documents are arranged according to census districts, sorted out by census areas and are given preparatory treatment for feeding into the OMR machines.

Field Work and Its Supervision

In census operation the most important activity is enumeration. There could be two alternative approaches for collection of information from individual persons. One method is mailing inquiry and second is door to door canvassing. Each method has its own advantages and disadvantages. The former is less expensive, requires no manpower for field work and hence no training and no supervision of such people but it demands achievement of 100 percent literacy in the census area and insertion of detailed instructions on the questionnaire about recording of the requisite information. Canvassing method does not require 100 percent literacy attainment and carrying of detailed instructions on the questionnaire but it can not be implemented without engaging field staff and giving them adequate training so that they could fill in the information on questionnaire provided by the respondents, interrogate and probe where necessary for collection of desired information. This method also requires supervision of the field staff. Therefore as compare to the former method the latter is relatively for more expensive. Nevertheless a society having low literacy level has limited choice and is bound to depend upon door to door canvassing for census taking. For this very reason Pakistan up till now is depending upon the latter method.

In the 1998 Census, each supervisor on an average had to check ⁱⁱⁱ 6/7 households per day. Though the volume of work per supervisor was greater in this census when compared with the previous one yet he was assisted by a vigilance team and armed forces personnel. Further more for his mobility, transport was provided with the assistance of armed forces personnel. Above all,

full cooperation was generally extended by the respondents in the presence of armed forces personnel.

Supervision, inter-alia, can play a considerable role in improving the quality out-put besides uplifting degree of completeness of any statistical activity. Field operation of the 1998 Census is supervised by four different groups of people i) technical staff of Population Census Organization and Federal Bureau of Statistics, ii) Armed forces personnel iii) Judiciary and iv) Monitoring teams of provincial governments. An element of objectivity is introduced in the supervision in such a way that each supervisor filled up some specially designed forms by making field visit and then he matched those with the performance of the concerned enumerators. In case of any discrepancies these are explained to the enumerators for rectification. Monitoring cells established at provincial capitals were keeping an eye watch on day to day progress of census work in their respective provinces and informing and suggesting the Population Census Organization for remedial measures in order to ensure timely completion and full coverage of census work.

In large operation like census where services of field staff are borrowed from respective provincial governments some lapses like shortage of field use material and field workers, political disturbances etc are not beyond expectation. Therefore establishment and functioning of control room becomes imperative. The role of control room is to attend complaints, suggest action for rectification and controlling the situation. Control Rooms were established at Islamabad, four provincial capitals and in the offices of census district officers. These control rooms were connected with Islamabad control room. Islamabad control room was also connected with field workers through powerful communication system of Armed Forces. Because of Armed Forces involvement in the 1998 Census control room was very effective in disposing of the public complaints in the shortest possible time that was the reason that this time there was no major complaint lodged from any corner.

III) Post Enumeration

Post enumeration activities cover mainly data processing, tabulation, analysis of data and report writing.

Data Processing and Tabulation

On retrieval of census filled in questionnaires these are matched with the inventory list of census blocks to ensure that no record is missing in the process of retrieval. Then documents are sorted out and rearranged according to census districts, administrative districts within each administrative division and province. A minimum editing of documents was done manually to check the block identification and its code, household code and serial number and name of individual persons. Then edited documents were given necessary treatment for removal of dust and moisture. Treated documents, block wise with identification sheet, are fed into OMR machine for scanning of census information. There after imputation of inconsistent, invalid and blank entries are carried out through computer using hot deck CONCOR software for which initial values are inserted by computer personnel in consultation with census experts. Therefore what ever data are available as hard copy are imputed data which might not reflect the true pattern or frequency distribution of un-imputed data. Data processing is carried out district by district. It took almost two years in processing the entire data at national level including Azad Jammu and Kashmir and Northern Areas.

After imputation census data are rearranged in tabular format representing the most important information in individual cells, column and row headings, box and spanner headings and least important variables as caption headings on both side of each table. For each topic the variable information is cross classified with other core variables like sex, age etc with rural urban break up at district, provincial and national levels. Tabulation work is implemented district by district permitting release of census publications district by district followed by provincial reports and finally national report. This whole process of release of publication took two and a half years. Side by Side 17 bulletins are also released in order to meet emergent need of data users especially those associated with planning at any level.

For completion of each report some analysis of census data is done and presented in the form of census findings along with summary tables and main tables. Whereas detailed analysis of the data is carried out independently by Pakistan Institute of Development Economics and their findings are available in the form of proceedings of conference held in Islamabad in December 2003. Apart from these publications five hand books for four provinces and one for the nation as a whole are also released.