

MANAGING POPULATION CENSUS AND MUSINGS ON PROVISIONAL RESULTS

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Accurate knowledge of population and its spatial distribution provides enabling platform on which man's natural and acquired needs could be optimally met and also provide appropriate data in quality and quantity on which an account on how and to what extent of man's utilisation of resources within his living domain could be made. A census is the largest and most complex data collection operations undertaken by any government. Many of the challenges encountered are linked to the sheer size of the operation, when millions of dwellings need to be contacted, and thousands of people must be mobilized to help in the data collection efforts. This is in view of challenges posed by population explosion and its attendant stress on scarce available resources. Since population census is about people and their welfare, any development that seeks to improve the living conditions of the people must, therefore, take into consideration the rare insights provided by population census.

Such statements are most adequately applicable to a country like India. Indian population census has a rich tradition of adopting the best practices of operations and technological managements to the extent resource mobilization become possible.

Diversity in data collection personnel requires an integrated approach to management to ensure quality and efficiency in the management environment. India did put in place from time to time a number of new systems and processes to actively manage field data collection operations as well as data management technology. Census 2011 is no exception. It has tried to accommodate the changing management process and principles in all aspects and levels related to conduct of census. Publication of provisional census results within the shortest possible time, in itself, also a major management challenge. This has already been met and the results for the country as a whole and its constituents furnish multi-flavored food for thought.

The paper presentations will seek to describe some of the management contexts in which challenges were tackled during 2011 Indian census. The backdrop may be the county as a whole and the eastern state of Orissa as a case study for comparison. It may be mentioned that Orissa does not fall strictly into the north –south dichotomy in which India is usually presented from socio-demographic point of view. Orissa also presents a demographic picture of declining fertility with relatively very high level of infant mortality. The presented revelations from provisional results may reflect comparative perspectives of some selected states like Kerala; a state considered presenting ideal situation and Madhya Pradesh, a demographically disadvantaged state. The state of Orissa and Madhya Pradesh are both among Empowered Action Group states who are getting focused attention for demographic development. Interstate comparison on some of the indicators may attract notice to situations in other states. Positive and negative aspects as revealed will be discerned for quick policy and strategic response. Management lapses identified may guide for future.

Politico-Legal Management

Census taking is not all about technical competence and knowledge only, but is heavily dependent on skillful management of the country's political environment and past census

history. While demographic accuracy is required, ultimately its national and regional political acceptance is essential to be successful -J.K. Bantia.

These observations are amply taken care of in Indian census as it is fortified by a rich census heritage since colonial days. After independence, the Census Act was passed in 1948 to give the census the legal back-up. Political will, thus, flows from the historicity and blessed each time by the political top brasses of different affiliations. Since independence, 2011 is the 7th census which is completed successfully. The cooperation and acceptance is elicited through notifications at different stages and appointment of census officers at different having the backup of the Census Rules 1990 and amendment to Census Act in 1993.

Along with census 2011 house listing phase, information was collected for preparation of a National Population Register and issue of National Identity Cards as stipulated under the Citizenship Act. Political deliberations promoted collection of data on different castes, which are described by sociologists as special attributes in the contexts of Indian population. However, the caste census may be conducted as a sequential adjunct operation following population census this time.

- The Notification regarding the intention of the Government of India to conduct a Census of the population of India in 2011 was published in the Gazette of India on 20th February 2009.
- In the same Notification, the Reference Date was also notified as 00.00 hours of the first day of March 2011 (except for the snow-bound areas of Jammu & Kashmir, Himachal Pradesh and Uttarakhand). In the snow-bound areas of Jammu & Kashmir, Himachal Pradesh and Uttarakhand, the Reference Date was notified as 00.00 hours of the first day of October 2010.
- The Notification regarding the non synchronous areas (snow-bound) in Jammu & Kashmir, Himachal Pradesh and Uttarakhand was published in the Gazette of India on 20th February 2009.
- The Notification regarding the conduct of Houselisting and Housing Census from 1st April 2010 to 30th September 2010 in different States and Union Territories was published in the Gazette of India on 25th February 2010.
- The questions proposed to be canvassed during the Houselisting and Housing Census was also published in the same Notification.
- The Notification regarding the questions to be canvassed in the Population Enumeration was published in the Gazette of India on 31st August 2010.

Planning Management

The Census 2011 had undergone the consultation process required for effective management by requesting for data requirements for different development and administrative activities.

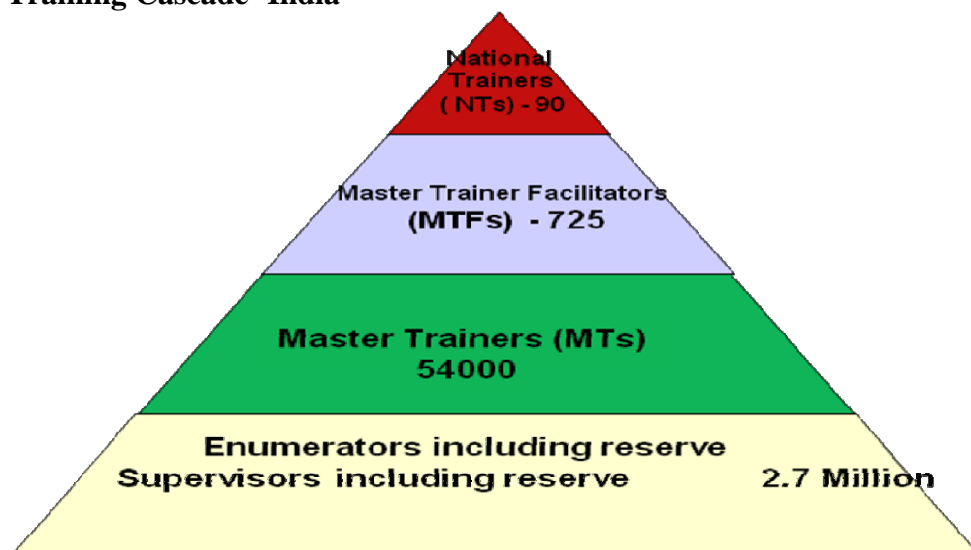
These are discussed in data user conferences attended by experts and development administrators including census administrators. Political acceptance gets reinforced in the address in such forums by the ministers and subsequently through appeals to people, by heads of state and also governments at national and state levels, to cooperate in census data collection. Jurisdictional changes since the 2001 census were frozen and finalized as on 31.12.2009. Director Census Operations in different states and nodal officers were identified and put in place to strengthen the hierarchical structure.

Human Resource and Management

A three tier cascade of training was devised for this purpose. At the top of the pyramid were a group of National Trainers, 90 in number. This group was rigorously trained for 5 days at a residential training camp. The National Trainers trained 725 Master Trainer Facilitators (MTFs) at the State level. The MTFs in turn, trained 54,000 Master Trainers (MTs) at the District level. The MTs ultimately trained the 2.7 million Enumerators and Supervisors at the field level. Special efforts have been taken to improve the Instruction Manuals by including more illustrations and examples. Training Guides have also been prepared. The Trainers at each level – National, State and District levels have been given intensive in-house training and provided training aids, such as Power Point presentations, e-Learning Modules, scripts of Role Plays and Practice Sheets. Special training modules have been developed for explaining the issues relating to disability and gender. Special Training modules have also been developed and rendered in Gender sensitive Districts. It needs mention that the entire training strategy has been a collaborative effort between the UN Agencies (UNFPA, UNICEF, UNDP and UNWOMEN) on one hand and the Census Organisation on the other.

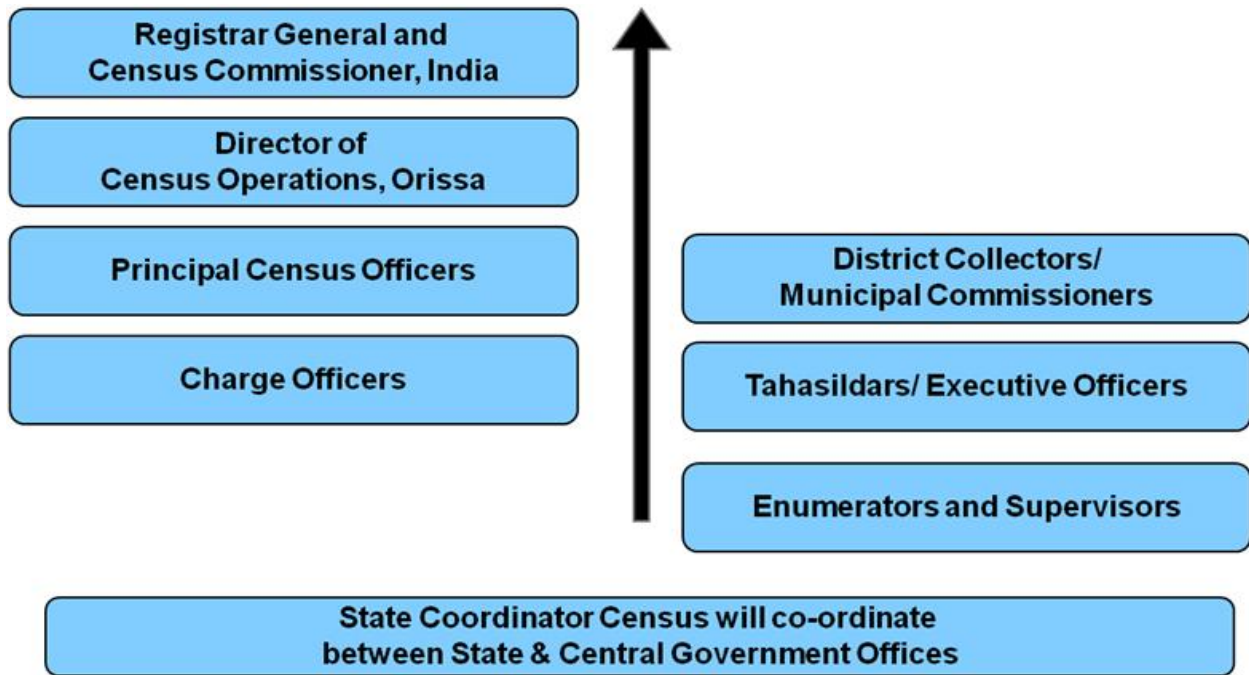
A new feature in Census 2011 has been the utilisation of Non-Governmental Agencies in the training effort. In order to supplement the manpower deployed for training by the Directorates of Census Operations of the States/UTs, trained manpower from NGOs was also utilised. In addition, volunteers from NGOs working in the field of disability and gender were associated with Census 2011 for sensitising the trainers at National, State and District levels.

Training Cascade- India



Management of human resource is organised through a temporary hierarchical structure developed dovetailing with the structure already available at central and state levels for other administrative purposes. The Directorate of Census Operations of central government provides the technical guidance and assistance and field data collection operation rests with the state coordinators of the concerned states utilising for operation and supervision a specially designated hierarchy. The organogram depicting the structure is presented below:

CENSUS HIERARCHY



Information Campaign Management

All modes of Publicity - Mass media, Public relations, Outreach activities and Digital media have been used to spread awareness and enlist the cooperation of all stakeholders. A scientific media plan was designed by a professional agency that also created the media content in both the phases of the Census. While the general theme was that of including everybody without omission, special emphasis was laid on vulnerable groups like women, elderly, disabled, infants. Press Advertisement announcing the start of the Population Enumeration on 9th February 2011 and counting of the homeless on 28th February 2011 were issued well ahead. Celebrity endorsements were also broadcasted. A new initiative - 'Census in Schools' was launched across the country. The purpose of this programme was to make all children aware that the Census was taking place and that they had a role in ensuring that the data for their own family was recorded correctly. Another purpose was to expose them to the significance of Census Data in the development of the country. The programme covered about 60 to 80 schools in each of the 640 Districts in the country and was specifically designed for participation by the students of the entire school in general and the students of class VI, VII and VIII in particular.

Census 2011 also saw the use of a Mascot - a lady enumerator. This was done in order to encourage and acknowledge the services of the real heroines/ heroes of the Census, namely the enumerators. In addition to the efforts taken at the National level, publicity efforts were also taken at the level of the Directorates and at the District and local levels by the field officers.

An innovative Logo was adopted for Census 2011. The Logo was designed by Shri Padarabinda Rath, an officer of the Census organisation and was highly appreciated for its concept and design.

A unique feature of Census 2011 was the innovative use of social networking sites such as Facebook and Twitter. The enthusiastic response of the younger generation to this initiative and the very positive comments posted on the site were motivating. A photography competition was also launched in connection with the Census 2011 which saw very active participation.

The Department of Consumer Affairs also ran an effective campaign during the Census period calling upon the public to be aware and to ensure that they were not left out of the count. The National Trust also provided media content on the theme of disability.

The communications structure/media processes were managed as follows:

- national census campaigns for general audiences and key population groups was managed centrally
- national press/broadcast /national media was be managed centrally
- regional press/broadcast was co-ordinated jointly by the communications teams of DCOs and selected census area managers at district levels.

Printing makes the Indian Census particularly complex is that the Schedules are canvassed in 16 languages and the Instruction Manuals are developed in 18 languages. The requirement is also huge - 5.4 million Instruction Manuals and 340 million Census Schedules. To add to the complexity, the Schedules had to be printed on special grade paper, the specifications for which were evolved in India for the first time in consultation with experts in scanning technology and paper technologists. The services of the National Institute of Design, Ahmedabad were utilized to upgrade the quality and aesthetics of the Schedule. Unique features that make it stand out are Bar Codes in each Schedule, Unique Form Numbers, Pre Printing of certain Location Particulars, Uniform quality of printing and colour drop-out facility. This required printing in high end Presses having facility of variable printing and very high production volumes. That the entire quantity of material has been printed within the stringent timelines and with strict adherence to quality is a feat in itself. Approximately 12,000 Metric Tonnes of paper of various grades have been procured for this purpose. The result is that the Indian Census Schedules are comparable with the best Printing of Houselist and Housing in class internationally.

Innovations in Management

Some innovative initiatives made in Census 2011 are listed below:

1. **Video Conferencing:** The fact is that the Census Commissioner, India was able to personally talk to more than 600 of the 640 Principal Census Officers across the country during the actual Census, speaks volumes about this marvellous technology and its potential. There is no doubt that this personal contact went a long way in sensitising the Census Officials and enhanced their involvement.
2. **National Conference of all Principal Census Officers:** A National Conference was held on 4th March 2010 at Vigyan Bhavan in New Delhi in which Principal Census Officers, State representatives and Directors of Census Operations participated. The Conference was inaugurated by the Honourable Home Minister of India
3. **National Conference of Chief Secretaries and Director Generals of Police:** A National Conference of Chief Secretaries and Director Generals of Police was held on 11th June 2010 at Vigyan Bhavan in New Delhi. The Union Home Secretary chaired this Conference, which proved extremely useful in enlisting the full cooperation of the State/UT Governments.
4. **Conference of Chief Ministers and Lt. Governors:** The Honourable Union Home Minister spoke regarding the Census operations at the Conference of Chief Ministers and Lt. Governors held on 25th October 2010. The impact of this was also quite significant.
5. **State Conferences:** Senior Officers from the Office of the Registrar General, India visited all States during the Census and held State level meetings with the State and District Officers. The Census Commissioner, India personally visited 23 States/UTs during both phases of Census. The personal rapport built up during these visits with the State and District level officers paid rich dividends.
6. **Press Conferences:** The Honourable Union Home Minister and the Union Home Secretary held exclusive Press Conferences during both phases of the Census. This was also followed up with a series of such Press Conferences by the Census Commissioner, India and the Directors of Census. A specially developed Media Kit also served to enhance public awareness.
7. **Conference of the Directors of Census Operations:** In all, eight Conferences of Directorates of Census Operations were held in connection with the Census 2011.
8. **Conference of Military and Para Military Organisations:** A Conference of nodal officers of Military and Para Military Organisations was conducted at New Delhi with the active involvement of the Ministry of Defence and the Ministry of Home Affairs. Representatives of the Army, Navy, Air Force, Coast Guard and all the Para Military Organisations participated. Similar meetings were held in all Directorates. This sensitisation went a long way in enlisting the participation of these organisations in the Census.
9. **Use of Mobile Phones:** A database of mobile phone numbers was created at various levels and effectively used. The Charge Registers had the Telephone numbers of all functionaries, which was the most effective medium of communication used in Census 2011. Instructions, complaints and clarifications were all done through this medium.
10. **Short Mail Service (SMS):** Applications like “way to SMS”, bulk mail service was used to communicate instructions to field functionaries as well as receive and clarify doubts from field functionaries.

11. Call Centre: A toll free number was operated through both phases of Census and the calls were handled by a professional Call Centre. The Enumerators could ask queries which were routed to Census experts who clarified the same. The Centres also handled public complaints.
12. Web Site: Census website, besides other sections, hosted all the Instruction Manuals, Circulars and Frequently Asked Questions. This source was also accessed by the Enumerators as well as the public at large. Similar websites at the Directorate level were used for passing on instructions as well as for monitoring progress.
13. Audio Visual Media: Innovative training CDs were prepared by several Directorates and distributed to the field functionaries. Some also broadcast these over Educational TV Channels and used it as a training medium.
14. Television Serials: An innovative method was the use of a popular Television Serial, like “Tarak Mehta Ka Ulta Chashma” to communicate message of Census 2011. This had a wide reach and great appeal.
15. Folk Arts: A few Directorates used the medium of local folk arts to communicate messages. This unique approach opened doors especially in remote tribal pockets and made Census taking easier.
16. Community Volunteers: This was a unique initiative in some North Eastern States where Civil Society Organisations joined hands with the Directorates to not only spread awareness but actually take part in the conduct of the Census. This has had a significant impact in these States and has greatly enhanced the participation of the general people in the Census.
17. Partnership with Non Governmental Organisations: Disability, Gender and Homeless, having been identified as areas requiring special focus, efforts were made in all Directorates to identify and work with credible Non Governmental Organisations. The participation ranged from awareness building to extensive involvement in training and even actual participation in the conduct of field operations. The results have been quite encouraging.
18. Media Plan: Scientific media and communication plans were prepared during both phases of the Census. This was done by engaging professional media consultants. The media campaign has been appreciated for its content, coverage and quality.
19. Republic Day Tableaus: Several States took out Tableaus on Census 2011 on the occasion of Republic day. This was very helpful in spreading awareness.
20. Car Rallies: Car Rallies were organised in several States. In Madhya Pradesh, the speciality was that the navigators of the Cars were persons with seeing disability.
21. Tricycle Rally: A tricycle rally was also organised in Delhi for the disabled.

Logistics, Supply Chain Management is concerned with the management of logistical flows and with the set of management practices used to design, plan, and control these flows in order to achieve seamless integration of the network of suppliers feeding an operations system.

The task of making available all the materials required for conducting the Census – Enumerators Kits, Instruction Manuals and other training materials, Census Schedules in the right quantity and in the right language to the Charge Officers (approximately 17,000 in number) and the

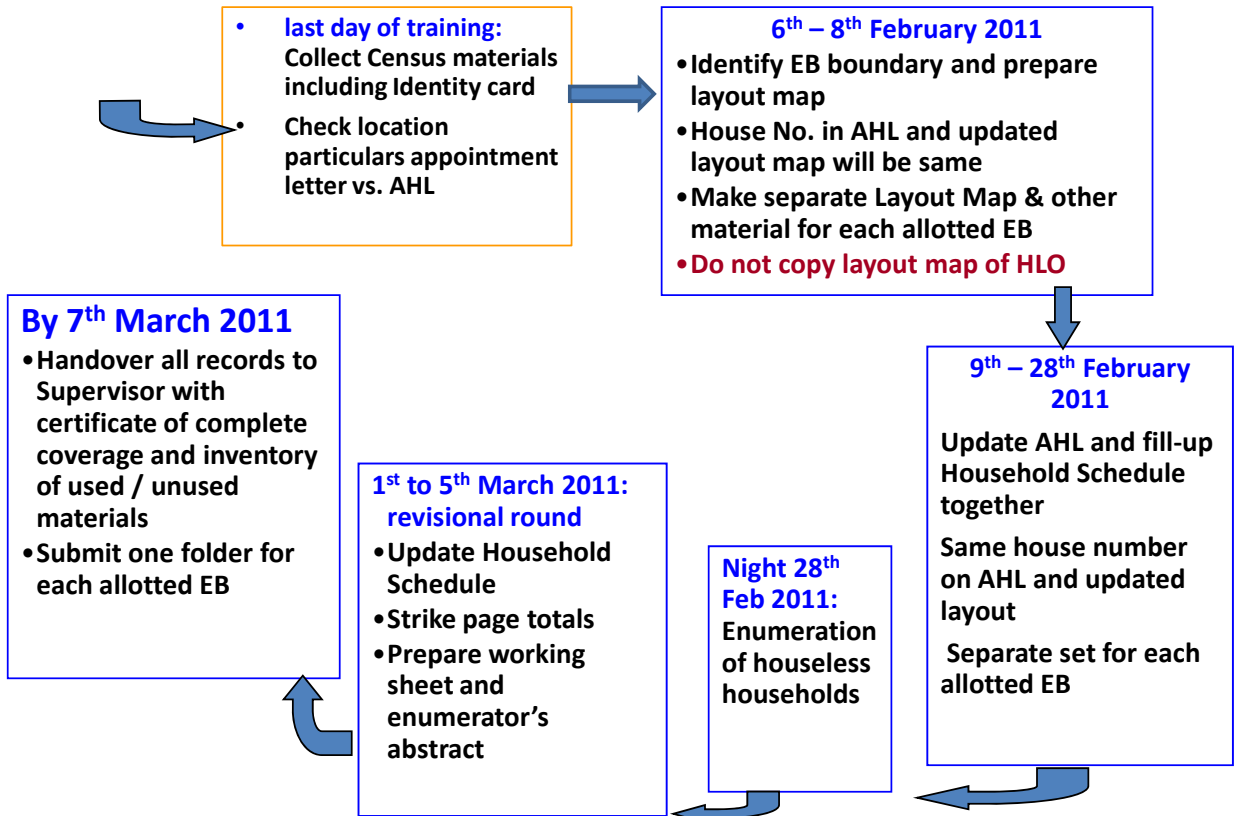
reverse collection of filled in Schedules and other material, as can well be imagined is a logistical nightmare. Adding to the complexity is the fact that each Charge may use material in several languages. The first task was therefore to prepare an accurate database of Charge-wise requirement of materials. The next task was to pack the materials as per the database, address each package correctly and have them shipped out to each location. Printing was done at locations spread all over the country with varying levels of efficiency, which added to the challenge. It is a matter of satisfaction that the entire task of printing and packing of materials was accomplished in time and with a fair degree of efficiency.

As regards the transportation of materials, a pioneering initiative of using the India Post for handling the logistics was undertaken. A special 'Logistics Post' arrangement was put in place by India Post for the Census 2011. Though there were a few operational problems, the precision with which the entire logistics operation was accomplished within a very short period of time, is remarkable.

Field Operation Management

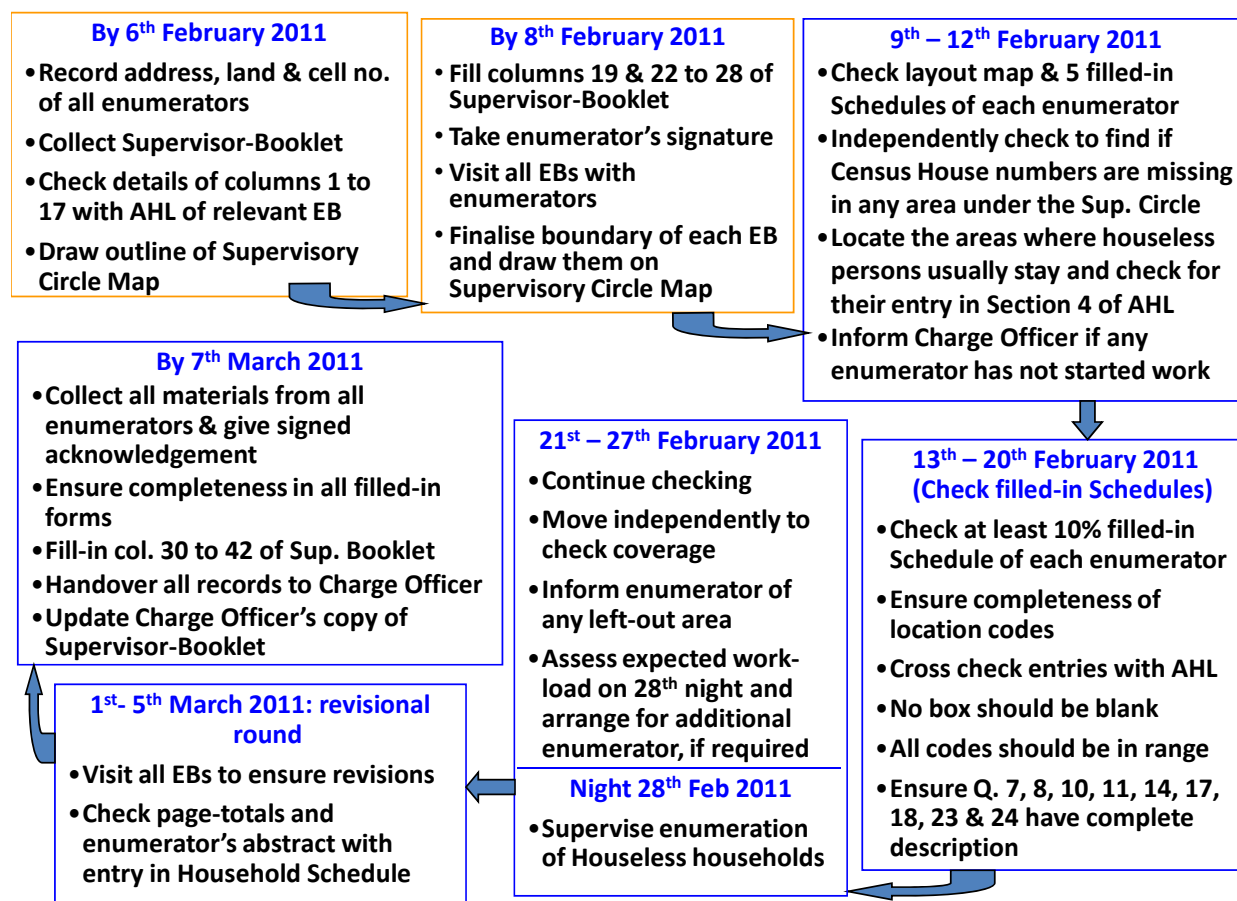
Operations Management is concerned with the way organisations produce goods and services, and in particular the tasks, issues and decisions of those operations managers who deliver the services or make the products on which everyone depends. Traditional topics covered in this field include Operations Strategy, Product & Process design and development, Capacity management, Location and layout, Quality Management and continuous improvement, Service Operations Management, Purchasing and materials management, and Performance measurement. The flow charts below depict the stages of field operations. As can be seen, meticulous planning of the whole operations was done with a fixed time line set for different operations. During the course of discussions of different management aspects most of the operation have been hinted at. The field operation utilized an elaborate management information system for performance monitoring. Use of mobile phones for clarification of concepts and monitoring of progress proved quite effective. Handholding by trainers and supervisors developed confidence of field personnel.

DUTIES AND RESPONSIBILITIES OF ENUMERATOR



7

DUTIES AND RESPONSIBILITIES OF SUPERVISOR



Non-response Management

The census help line and local census offices often receive requests for assistance from respondents, such as requests for inclusion in census, requests for inclusion of their language, etc. Enumerators systematically canvass in assigned collection units for filling the questionnaires and listing all dwelling addresses and attributes in a visitation record. The questionnaires are pre-printed with barcodes and geographic identifiers that correspond to specific rows in the visitation record. Repeat visits take care of the absentees at the time of first visits and tries to include every ones. Revisional rounds ensure the inclusion of events prior to the census reference time.

Census Partners

Partnering with NGOs has been one of the special features in 2011 census. They were not only involved in training process but used in a handholding strategy during entire census operation through clarifying various concepts as and when required by the field personnel whom they have trained.

Some Comparison with Previous Censuses

The management effectiveness of Indian census will be further amplified looking at the following table which indicates that the reference dates were same for nearly eight decades since 1941 except in 1971. Consistency in the method of data collection for eight decades also presents a unique feature of Indian Census.

Reference Date and Method of Census Taking from 1901 to 2011 Census

| Census | Reference Date | Method |
|--------|---------------------------|---------------------------------|
| 1901 | 1 st March | de facto (Synchronous) |
| 1911 | 10 th March | de facto (Synchronous) |
| 1921 | 18 th March | de facto (Synchronous) |
| 1931 | 26 th February | de facto (Synchronous) |
| 1941 | 1st March | Extended de facto (Synchronous) |
| 1951 | 1st March | Extended de facto (Synchronous) |
| 1961 | 1st March | Extended de facto (Synchronous) |
| 1971 | 1 st April | Extended de facto (Synchronous) |
| 1981 | 1st March | Extended de facto (Synchronous) |
| 1991 | 1st March | Extended de facto (Synchronous) |
| 2001 | 1st March | Extended de facto (Synchronous) |
| 2011 | 1st March | Extended de facto (Synchronous) |

Another significant feature of Indian Census is improving upon the questionnaire and questioning in each census using the recent conceptual developments, advances in technology and changing data requirements. The comparison illustrated in the table below proves the case in point.

| Sl. No | Census 2001 | Census 2011 | Remarks |
|---------------|---|---|---|
| 1 | Name of person | Name of person | No Change |
| 2 | Relationship to head | Relationship to head | No Change |
| 3 | Sex | Sex | Provision for returning a gender other than male or female |
| 4 | Age in completed years | Date of Birth | Date of Birth in addition to age |
| 5 | Current marital status | Current marital status | Separate codes for 'Divorced' and 'Separated' |
| 6 | Age at marriage | Age at marriage | No Change |
| 7 | Religion | Religion | No Change |
| 8 | Mother tongue | Mother tongue | No Change |
| 9 | Other languages known | Other languages known | No Change |
| 10 | Literacy status | Literacy status | No Change |
| 11 | Highest educational level attained | Highest educational level attained | No Change |
| 12 | Status of attendance in educational institution | Status of attendance in educational institution | Separate Codes for persons who have never attended and who have attended before |
| 13 | Disability | Disability | Question modified. Three questions instead of one. |
| 14 | Did the person work any time last year | Worked any time during last year | Additional codes for two types of marginal workers (3-6 months, less than 3 months) For main or marginal worker |
| 15 | Category of economic activity | Work Category | No Change |
| 16 | Occupation of the person | Occupation | No Change |
| 17 | Describe in detail the nature of industry, trade or service | nature of industry, trade or service | No Change |
| 18 | Class of worker | Class of worker | No Change |
| 19 | Record Code of non-economic activity | non-economic activity | Adding a separate code for rentiers |
| 20 | Is the person | Seeking/available | No Change |

| | | | |
|----|---|---|------------------------------------|
| | seeking/available for work | for work | |
| 21 | Distance from residence to place of work in kilometres | One way distance from usual residence to place of work in kilometres | No Change |
| 22 | Mode of travel to place of work | Mode of travel to place of work | No Change |
| 23 | Birth place | Birth place | Name of village/town is also added |
| 24 | Place of last residence | Place of last residence | Name of village/town is also added |
| 25 | At the time of migration, was the place of last residence Rural/Urban | At the time of migration, was the place of last residence Rural/Urban | No Change |
| 26 | Reason for migration of this person | Reason for migration of this person | No Change |
| 27 | Duration of stay in this village or town since migration for ever married | Duration of stay in this village or town since migration | No Change |
| 28 | Number of children surviving at present | Number of children surviving at present | No Change |
| 29 | Total no. of children ever born alive | Total no. of children ever born alive | No Change |
| 30 | Number of children born alive during last one year | Number of children born alive during last one year | No Change |
| 31 | Total net area of land under cultivation/ plantation | -- | Dropped |
| 32 | Net area of irrigated land | -- | Dropped |
| 33 | Tenure status of land under cultivation/ plantation | -- | Dropped |

Data Management

In the current 2011 census, the forms have been printed in 16 languages this time which only reaffirms the fact it is indeed the largest such exercise in the world. The ICR Technology that

was pioneered by India during the 2001 census has become a role model for major countries across the globe. The improved version of this software is being utilized again for the scanning of the Census Forms at high speed and automatic interpretation of the data in the 2011 census as India already has the expertise to deal with it and it has been successfully implemented in the past. It is evident that the percentage of data captured grew from a mere 5 percent to 100 percent over the last fifty years due to the innovations in technology. In 2011 census the scanners that are being used have additional features like image enhancement, removing noises and detection and auto correction of images through its own software. The version of ICR software that is being used this time has better recognition features and its workflow management capacity is also enhanced.

Intelligent Character Recognition (ICR)

Software converts hand printed characters to a machine readable format. This is a very crucial technology which has a high utility value. Ability to recognize hand written characters makes it very suitable and apt for the data processing activities involved in a census and helps in saving a lot of time besides raising the accuracy levels. This could not have been achieved if done manually. The software for ICR is actually based on the science of neural networks which is like a human brain. It is termed intelligent because it is able to tackle the variations in the character shapes.

Provisional Results 2011

Provisional census results were released in the shortest possible time immediately after conduct of census. It generates heat of quick responses. Responses may be more focused only after final results arrived through cent percent scanning of the pre designed schedules specially in the context of use of ICR technology. The provisional sum totals the information supplied by the Principal Census Officers of the district.

Projected versus Enumerated population

The expert committee on population projection constituted by Registrar General India had projected population for different points of time. These are compared with the respective provisional totals reported by different censuses. As may be seen the differences vary from -2.05 to 1.48% during 2011 census. The difference is marginal as is evident from the table below.

Projected and actual provisional population of India 1971-2011(in '000)

| Year | Projected Population | Actual/Provisional Population | Difference (1) | Percent difference (2) |
|-------------|-----------------------------|--------------------------------------|-----------------------|-------------------------------|
| 1 | 2 | 3 | 4 | 5 |
| 1971 | 5,59,622 | 5,48,160 | -11,462 | -2.05 |
| 1981 | 6,72,014 | 6,83,329 | 11,315 | 1.68 |
| 1991* | 8,37,249 | 8,46,421 | 9,172 | 1.09 |
| 1991** | 8,43,596 | 8,46,421 | 2,825 | 0.33 |
| 2001 | 10,12,386 | 10,28,737 | 16,351 | 1.62 |
| 2011 | 11,92,507 | 12,10,193 | 17,686 | 1.48 |

* Report of the Expert Committee on population projections, Registrar General India, Jan 1988

** Report of the Standing Committee of experts on population projections, Planning Commission India, New Delhi 1989

Looking at the situation of the selected states, it is revealed that the Kerala state which is developed literacy wise has -3.4 percent difference where as the state of Madhya Pradesh has 0.55 percent difference and for Orissa the difference is 2.94 percent when the projected and provisional population of the states are compared.

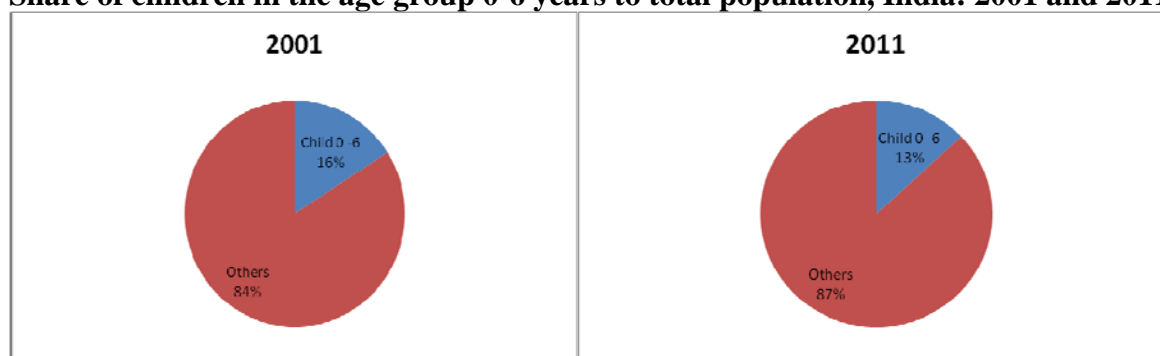
Projected and Provisional Population of Selected States in 2011 census

| Sl. No. | State/Union Territory# | Projected population (in '000) | Provisional population (in '000) | Difference | Percent difference |
|----------------|-------------------------------|---------------------------------------|---|-------------------|---------------------------|
| 1 | 2 | 3 | 4 | 5 | 6 |
| 1 | Madhya Pradesh | 72,200 | 72,598 | 398 | 0.55 |
| 2 | Kerala | 34,563 | 33,388 | -1,175 | -3.40 |
| 3 | Orissa | 40,750 | 41,947 | 1,197 | 2.94 |

Child Population (0-6)

The share of child population 0-6 years has declined from 15.93% to 13.12% between 2001 census and 2011 census. Possible decline in fertility is indicated. The state wise data reveals that the percentage of child population has declined in all the states except Jammu & Kashmir. The percentage of child population in 2011 census is 9.95 in Kerala, 12 in Orissa and 14.53 % in the state of Madhya Pradesh indicating the trend of fertility among the states under comparison.

Share of children in the age group 0-6 years to total population, India: 2001 and 2011

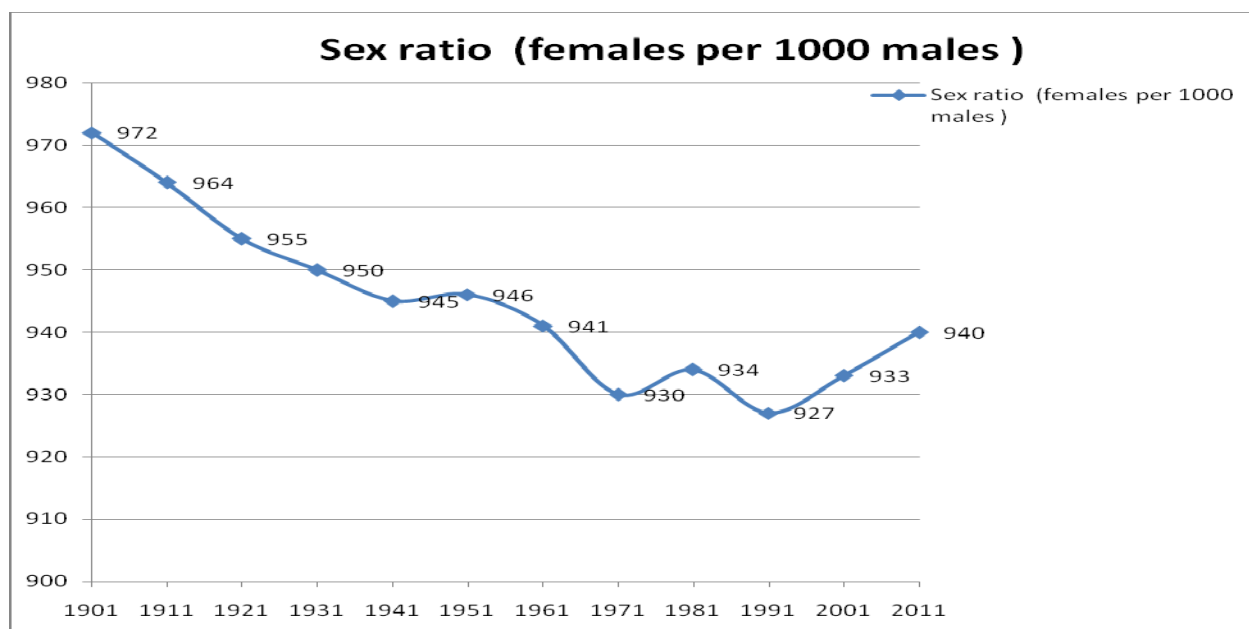


Overall Sex Ratio (Females per 1000 Males)

Indian Census traditionally report sex ratio as females for 1000 males in contrast to the practice in many other countries. Sex composition is one of the main aspects of Indian census and speculations based on the provisional results spark press reporting. The graph and table presented below show the trend in overall sex ratio in different censuses. The sex ratio of the general population has shown an increasing trend in 2011. The increase in trend is a sequel to the increase in previous two censuses.

Sex ratio from different Census for India Sex ratio, India: 1901-2011

| Census year | Sex ratio (females per 1000 males) |
|-------------|-------------------------------------|
| 1901 | 972 |
| 1911 | 964 |
| 1921 | 955 |
| 1931 | 950 |
| 1941 | 945 |
| 1951 | 946 |
| 1961 | 941 |
| 1971 | 930 |
| 1981 | 934 |
| 1991 | 927 |
| 2001 | 933 |
| 2011 | 940 |



Distribution of State / Union territories by range of sex ratio of India: 2001 and 2011

| Sex ratio | 2001 | Percentage of population to total population, 2001 | 2011 | Percentage of population to total population, 2011 |
|-------------|------|--|------|--|
| 880 & below | 8 | 5.98 | 6 | 3.65 |
| 881-915 | 4 | 17.44 | 4 | 19.87 |
| 916-950 | 11 | 47.18 | 10 | 45.08 |
| 951-985 | 8 | 18.12 | 8 | 13.01 |
| 986 & above | 4 | 11.28 | 7 | 18.4 |

As is revealed from the above table, the number of States and Union territories with sex ratio less than 916 declined from 12 to 10 in 2011 census. In contrast the number of States and Union territories with high sex ratio of 986 & above gone up from 4 in 2001 to 7 in 2011.

Distribution of State / Union territories by range of sex ratio below National level and above National level: 2001 and 2011 of India: 2001 and 2011

| Sex ratio | Number of state /Union Territories 2001 | Percentage of population to total population, 2001 | Number of state/Union Territories 2011 | Percentage of population to total population, 2011 |
|-------------------------------|---|--|--|--|
| Below National average | 17 | 57.19 | 17 | 58.31 |
| Above National average | 18 | 42.81 | 18 | 41.69 |

The number of states having sex ratio below and above National average has remained constant in both the censuses as revealed from the above table. However, there is slight increase in percent of population having sex ratio below national average. This possibly point towards an area of concern inspite of the silver lining of increase in sex ratio.

Sex Ratio of the Child population (0-6)

It has been a practice in Indian census to collect quick information on child population 0-6 years to facilitate calculation of literacy rates for international comparison. As a byproduct a vital indicator like child sex ratio is presented. The advantage of this indicator is that it is not affected by migration. It reflects the gender sensitivity in the contexts of females of the society and consequent demographic behaviour.

Sex ratio of total population and child population in the age group 0-6: 1961-2011

| Year | Sex ratio in age group 0-6 years | Overall sex ratio |
|-------------|---|--------------------------|
| 1961 | 976 | 941 |
| 1971 | 964 | 930 |
| 1981 | 962 | 934 |
| 1991 | 945 | 927 |
| 2001 | 927 | 933 |
| 2011 | 914 | 940 |

The table above depicts the trend in general sex ratio vis-a vis child (0-6 years) sex ratio. It is revealed that while there is an increase in the general sex ratio, whereas the child sex ratio has declined from census to census since 1961. The crossover of child sex ratio towards a critical level of decline is an area of major concern brought out by the provisional census results particularly when the growth rate and fertility are entering a phase of incipient decline. The decline in child sex ratio not only creates social disturbances but also a confusing situation manifesting as a negative effect of social development.

Distribution of State / Union territories by range of sex ratio of child population in the age group 0-6 years: 2001 and 2011

| Sex ratio | 2001 | Percentage of population to total population, 2001 | 2011 | Percentage of population to total population, 2011 |
|------------------|-------------|---|-------------|---|
| 880 & below | 4 | 5.27 | 5 | 6.51 |
| 881-915 | 5 | 20.76 | 9 | 46.13 |
| 916-950 | 8 | 45.95 | 12 | 39.20 |
| 951-985 | 18 | 28.02 | 9 | 8.16 |
| 986 & above | 0 | 0 | 0 | 0 |

As can be seen from the above table, the number of States and Union territories below a child sex ratio of 916 has increased from 9 to 14. Similarly the number of States and Union territories having advantageous sex ratio of 950 and above has declined from 18 to 9. The distribution again confirms the concern generated by decline in sex ratio of child population in the country.

Comparative Demography of Some Typical Indian States

As already indicated, one of the thrust area of this presentation is to muse on a comparative perspectives based on provisional census results. The rationale for selecting the states has already been indicated at the outset. The focus set is to describe how demographic manifestations share in different development settings. The selected states are typical in their own presentation. The revelation may provide lead for emulation of best practices for the states, which are at different stages of demographic and developmental transitions.

As can be seen from the table below, according to population size Madhya Pradesh is the highest and Kerala lowest, Orissa is in between. Madhya Pradesh has the highest percentage to total Indian population. Average annual exponential growth rate is less than 0.5 in Kerala and the highest 1.87 is reported by Madhya Pradesh. Orissa has a growth rate of 1.32 which is less than the country average. Density is very high in Kerala whereas it is very low in Madhya Pradesh. Female literacy is above 90% in Kerala and 60% in Madhya Pradesh. Male-Female gap is less than 5% in Kerala whereas it is more than 20% in Madhya Pradesh. Kerala and Orissa are neighbours according to rank in size of population. Per Capita Income is highest in Kerala and lowest in Madhya Pradesh among the states being compared. Percentage below poverty line is highest in Orissa and lowest in Kerala.

It is revealed that Orissa is close to the average in demographic situation to that of all India but is much below in development indicators. The data shows, in spite of lower development indicators, Orissa is at a better stage of demographic transition whereas Madhya Pradesh is at the middle in development indicators among the three states but demographically disadvantaged. Kerala has a great upliftment with regard to both development and demographic indicators.

Population and development indicators for selected states and all India

| Indicators | India | Orissa | Kerala | Madhya Pradesh |
|--|----------------|---------------|---------------|-----------------------|
| Population Size(2011) | 1,21,01,93,422 | 4,19, 47 358 | 3,33,87,677 | 7,25,97,565 |
| Percent of population | 100 | 3.47 | 2.76 | 6.00 |
| Average annual Exponential growth Rate (2001-11) | 1.64 | 1.32 | 0.48 | 1.87 |
| Density | 382 | 269 | 859 | 236 |
| Female literacy | 65.46 | 64.36 | 91.98 | 60.02 |
| Male- Female Literacy Gap | 16.68 | 18.04 | 4.04 | 20.51 |
| Rank According to size of Population | -- | 11 | 12 | 06 |
| Per Capita Income(2010) | 46, 492 | 33, 226 | 59, 179 | 27, 250 |
| Percentage below Poverty line(2010) | 19.34 | 41.04 | 3.61 | 29.52 |

Overall demographic and development features prompts to little delving into trends in some individual demographic attributes. As is evident from the table given below the decadal growth-rate of population in case of Madhya Pradesh showed a declining trend from 27.24 in 1991 to 24.26 in 2001 which further reduced to 20.30 in 2011. Similar trend is also noticed in Orissa where the decadal growth rate declined from 20.06 in 1991 to 16.25 in 2001 and thereafter to 13.97 during 2011. In Kerala the decline is sharpest. This is just possible because of the factors like influence of development indicators, family planning program and out migration. In case of Orissa fertility inhibiting programs might have induced decline in population growth for last three decades. In Madhya Pradesh the development is yet to reach a significant level so as to make a dent on the growth rate and also the population programs do not seem to be that strong.

Growth rate of population

| Name of the Nation/States | Growth rate of Population in the year 1991- 2011 | | |
|----------------------------------|---|-------------------|------------------|
| | 1981- 1991 | 1991- 2001 | 2001-2011 |
| India | 23.87 | 21.54 | 17.64 |
| Orissa | 20.06 | 16.25 | 13.97 |
| Madhya Pradesh | 27.24 | 24.26 | 20.30 |
| Kerala | 14.32 | 9.43 | 4.86 |

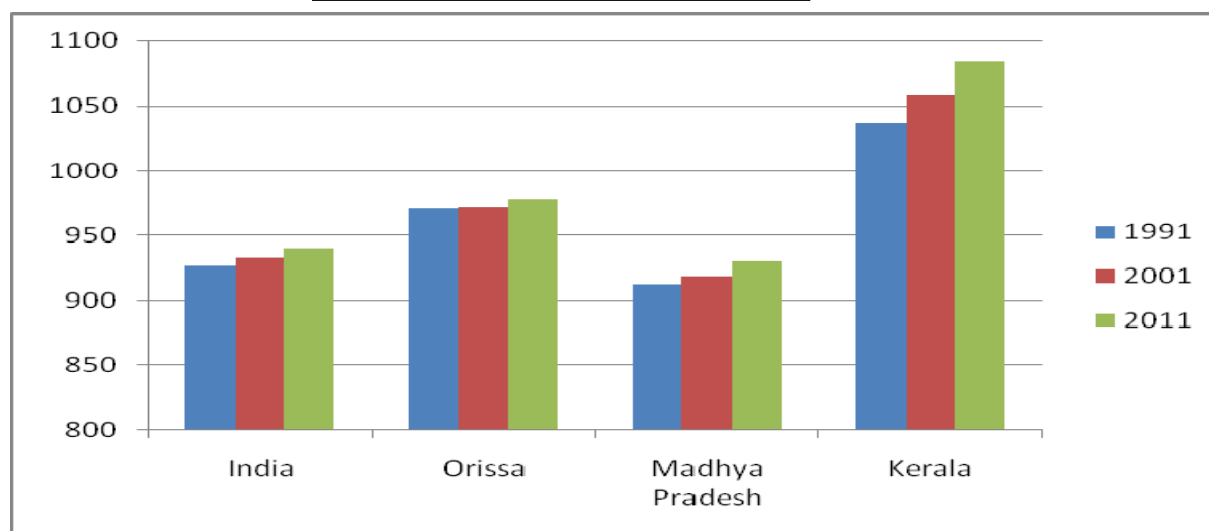
Regarding sex ratio in all the states in India, the rate has increased. Kerala shows a rate of further advantage to females showing sex ratio more than 1000 in both the censuses. Child sex ratio has declined in India as well as in the states of Madhya Pradesh and Orissa and marginal decline in Kerala. Although some possibility of age shifting is not ruled out, the rates reported are causes of major concern.

It is also revealed that the sex ratio in general population has shown an increasing trend so also female literacy in all the states. Possible association between both the indicators need to be investigated further. However, it is intriguing to note that during 2011 census comparison among the states show that the sex ratio of 0-6 years is lowest in Madhya Pradesh which is also lowest in female literacy. At many places it is observed that the sex ratio of 0-6 years is lower in the states which are considered relatively developed and prosperity oriented.

| India/States | Sex Ratio | | | Female literacy | | |
|-----------------------|-----------|------|------|-----------------|-------|-------|
| | 1991 | 2001 | 2011 | 1991 | 2001 | 2011 |
| India | 927 | 933 | 940 | 39.29 | 53.67 | 65.46 |
| Orissa | 971 | 972 | 978 | 34.68 | 50.51 | 64.36 |
| Madhya Pradesh | 912 | 919 | 930 | 28.85 | 50.29 | 60.02 |
| Kerala | 1036 | 1058 | 1084 | 86.17 | 87.72 | 91.98 |

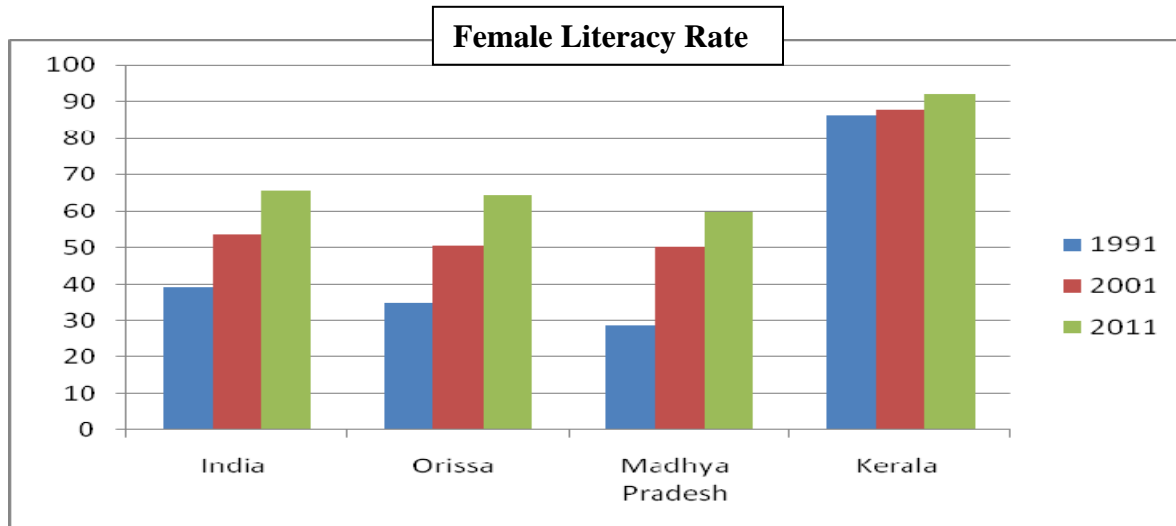
| India/ States | Sex ratio (females per 1,000 males) | | | | | |
|-----------------------|-------------------------------------|------|---|------|-----------------------------|------|
| | Total population | | Child population in the age group 0-6 | | Population aged 7 and above | |
| | 2001 | 2011 | 2001 | 2011 | 2001 | 2011 |
| India | 933 | 940 | 927 | 914 | 934 | 944 |
| Orissa | 972 | 978 | 953 | 934 | 976 | 985 |
| Madhya Pradesh | 919 | 930 | 932 | 912 | 916 | 933 |
| Kerala | 1058 | 1084 | 960 | 959 | 1072 | 1099 |

Sex ratio from 1991-2011



Female literacy in Three Decades

| India/States | Female literacy | | |
|----------------|-----------------|-------|-------|
| | 1991 | 2001 | 2011 |
| India | 39.29 | 53.67 | 65.46 |
| Orissa | 34.68 | 50.51 | 64.36 |
| Madhya Pradesh | 28.85 | 50.29 | 60.02 |
| Kerala | 86.17 | 87.72 | 91.98 |



Concluding Observations

The management challenges in Indian Census emanate from sheer size of the population. They are further intensified by the ethnic and linguistic diversity, sparsely distributed in many areas of remote locations and large requirement of scarce resource to contact an illiterate mass of population. Availability of financial resources required for large scale technological adoption incorporating new methodologies developed in a competitive environment poses a major challenge. In spite of these challenges and many more the census 2011 can be described as a successful and gigantic management venture. The present census has been able to assimilate many management and technological innovations. However, gearing of the whole machinery can not be said to be satisfying but provide rich experience to improve the strategy in future. Development of user friendly computerised field monitoring system will improve the data quality further. In spite of the above observations, the Census of Population remains the best source of small area data that is available. The actual population counts and basic numbers may not be 100% accurate as many people might expect. While the exact numbers may not be completely accurate, the various derived indicators such as percentages and percent share (i.e. percent of people with a degree) are broadly comparable across the various jurisdictions and are considered a valid source for analytical purposes.

Provisional results reflect rays of hope as well as areas of major concern. The incipient decline in growth rate is a pointer that the country is heading towards population stabilization. However regional variation in growth still provides a case for renewed emphasis of population stabilization programmes for maintaining the continuing decline. Positive indications are observed in the achievement in female literacy and also increase in sex ratio all over the country. Regional levels may call for specific programmes. The dismal picture emerges from the decline of the child sex ratio. Epicenters spread over many parts of the country are developing which require focused policy intervention and implementation to tackle the menace causing the situations. However, the comments related to provisional results are also provisional. More in-depth investigations are required as we go along towards release of final results on more indicators. The final results may raise and reply more questions to be pondered over by researchers and development professionals and managers.

Some comments of luminaries and press

“The 2011 Census is an eye-opener and should be the starting point for converting the population stabilisation programme into a mass movement. Policy makers should devise separate policies for rural, semi-urban and urban areas in order to tackle the problem of a skewed sex ratio,”Rajya Sabha member Dr. Karan Singh has said.

J. Satia, senior director of Indian Institute of Public Health, said: “We need a reengineered family planning programme with greater involvement of men.”

“However, the results of the last two censuses, especially the findings of the 2011 Census, clearly indicate that the country has entered the last phase of demographic transition, usually characterised by rapidly declining fertility. The provisional Census 2011 figures suggest that two contrasting demographic “nations” are emerging in the country with all four south Indian States — Andhra Pradesh, Karnataka, Kerala and Tamil Nadu — already having achieved the replacement level fertility of 2.1 children per women required to initiate the process of population stabilisation, while the four large north Indian States — Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh — have still a long way to go before they achieve the required level.’ as brought out by the Management Institute of Population and Development in a paper.

The Census 2011 numbers reveal changes of a civilisational nature. First, the total number of people added at 18.1 crores in the ten years to 2011 is less than the total number of people added in the previous decade. This is the first time since 1921 that the total additions on a decadal level have fallen. -CNBC-TV18's

I think this census has marked a milestone. We have added much lesser population than the last decade. We have also registered very impressive growth rate which has fallen by almost 4% points since last time. So, this is significant when you read this along with the trends in some of the most popular states in India. –Dr. C. Chandramouli, RGI