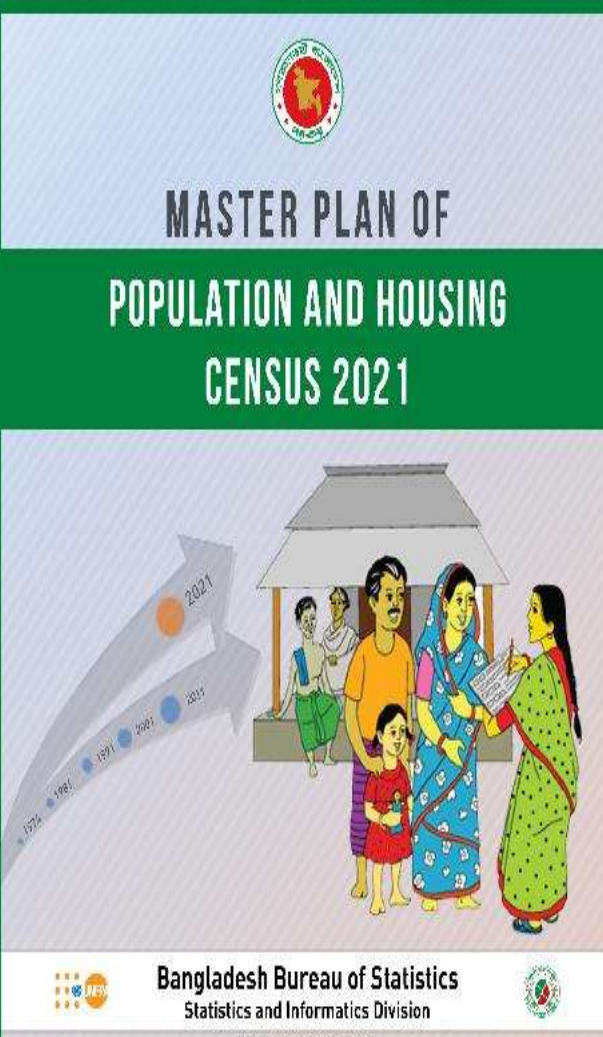




The diagram illustrates the 'Multi Channel Approach' for the census. It features a central orange hexagon labeled 'Multi Channel Approach' surrounded by six light blue hexagons, each representing a different data collection method: Focus Groups, Face to Face, Online, CATI, Postal, and PDA.

Bangladesh Bureau of Statistics
Statistics and Informatics Division
Ministry of Planning



The cover of the 'Master Plan of Population and Housing Census 2021' features the Bangladesh Bureau of Statistics logo at the top. The title is prominently displayed in a green banner. Below the title, an illustration depicts a census taker in a green sari interacting with a family (a man, a woman, and a child) in front of a traditional house. A large grey arrow points from the past to the future, with years 1974, 1981, 1991, 2001, 2011, and 2021 marked along its path.

MASTER PLAN OF POPULATION AND HOUSING CENSUS 2021

Bangladesh Bureau of Statistics
Statistics and Informatics Division
Ministry of Planning



Master Plan for Population and Housing Census-2021



**Strengthening Statistical Capacity of BBS for Collecting Data
on Population and Development (Stat4Dev) Project**
Bangladesh Bureau of Statistics
Statistics and Informatics Division
Ministry of Planning



March, 2018



Secretary in charge
Statistics and Informatics Division (SID)
Ministry of Planning
Government of the People's Republic of Bangladesh

Foreword

Bangladesh Bureau of Statistics (BBS), the National Statistical Organization (NSO) of Bangladesh, is responsible for collecting and disseminating of statistics on population, demography, economics, as well as other social indicators and trends of the country's growth and development. Conducting of Population and Housing Census is one of the core activity of BBS. Census data is used for planning and policy making at the national and sub national levels. It is widely used for poverty alleviation programme interventions and improvement of the quality of life of the people. BBS conducted the latest 5th decennial census of the country during March 15-19, 2011. United Nations Population Fund (UNFPA) and European Union (EU) provided technical and financial support to BBS in conducting the Population and Housing Census 2011.

In order to conduct the next round of census in 2021 it is necessary to prepare a master plan so that the census can be done efficiently based on the lesson learnt from previous censuses and experience of other developing countries of the world. With the advancement of ICT in the recent year, the multimodal data collection has been planned for the 2021 round of census. Therefore, a draft master plan has been prepared with the technical support of UNFPA. The plan has been prepared through a consultative process and pre-testing the questionnaire and methodology in the field level. This will help to conduct the next round of census using multimodal data collection approach. More exercises will be conducted in the upcoming days to make this effort a success.

I would like to express my sincere gratitude to the Director General of BBS, Project Director, Stat4Dev Project and his team for their sincere efforts in preparing the draft master plan. Thanks are due to the officials involved in preparing the plan.

I believe that the plan will be useful to the development planners, BBS officials and all other stakeholders to understand the methods and procedures of the next census.

Dhaka, March, 2018

Saurendra Nath Chakrabhartty



Director General
Bangladesh Bureau of Statistics (BBS)
Statistics and Informatics Division (SID)
Ministry of Planning
Government of the People's Republic of Bangladesh

Preface

Population Census is the single most important and gigantic statistical activity in any country of the world. Bangladesh has a long history of census undertaking. The first census of the country was held in 1974 thereafter, the censuses were held in 1981, 1991, 2001 and 2011. Over the years improvements were held in census undertakings. The OMR questionnaire was first introduced in 1981 and continued in 1991. The OCR questionnaire was used in 2001 census and ICR questionnaire was used in 2011 census. In 2011 census Integrated Computer Assisted Data Entry (iCADE) software was used which helped in quick processing of census data. United Nations Population Fund (UNFPA) and European Union provided technical and financial support to 2021 census.

Bangladesh Bureau of Statistics (BBS) has a plan to conduct multimodal census in 2021 and as such a draft master plan has been prepared through consultative process. This will further be improved and modified with more pretest and pilot study before the actual census of 2021.

Let me also extend my earnest thanks to Mr. Md. Zahidul Hoque Sardar, Director & Project Director, Mr. A.S.M Qamaruzzaman, Deputy Director (CC), Mr. Md. Maksud Hossain, Statistical Officer, Mr. Md. Abubakar Siddique, Cartographer, and other colleagues of Stat4Dev project of BBS for preparing the master plan.

Thanks to the local consultant Mr. Nurul Islam Siddique for drafting the plan. Mr. Md. Shamsul Alam ex. Director BBS and Mr. Mahboob-E-Alam National Programme Officer UNFPA also contributed in improving the draft plan. Dr. Syed Shahadat Hossain, Professor, ISRT, Dhaka University provided editorial support for the report.

I am sure, the draft master plan be useful to the planners, researchers, policy makers and development partners to understand about the procedure of the next census of the country. Any constructive suggestions for further improvement of the plan will be appreciated.

Dhaka, March, 2018

Md. Amir Hossain



Project Director
Strengthening Statistical Capacity of BBS
for Collecting Data on Population
and Development (Stat4Dev) Project
Bangladesh Bureau of Statistics (BBS)
Statistics and Informatics Division (SID)
Ministry of Planning

Acknowledgement

I feel delighted to acknowledge the active role of officials concerned in undertaking the exercise for preparation of Master Plan for the 2021 Census. It is worth mentioning that the staff members of BBS have professionally and successfully completed the exercise overcoming all the challenges.

I would like to express my humble gratitude and thanks to Mr. Saurendra Nath Chakrabhartty, Secretary in charge, Statistics and Informatics Division (SID) and Mr. Md. Amir Hossain, Director General, Bangladesh Bureau of Statistics for their valuable suggestions, patient guidance and all out support for preparation of Master Plan. Dr.

It is my immense pleasure to mention that UNFPA Bangladesh has provided support to prepare the Master Plan. I wish to thank UNFPA for their partnership in statistical activities of BBS.

I am particularly grateful to Mr. A K M Tahidul Islam, Mr. Alamgir Hossain, Deputy Director, Mr. A.S M Qamruzzaman, Deputy Director (CC), Mr. Md. Maksud Hossain, Statistical Officer, Mr. Abubakar Siddique, Cartographer, Mr. Md. Firoz Ahmed Sarder, Statistical Officer, Mr. Dinesh Chandra Roy, Asst. Statistical Officer and other Stat4Dev Project officials who were the active members of the exercise.

I express my deepest gratitude to Mr. Nurul Islam Siddeque, who gave his full effort to draft the plan. Mr. Md. Shamsul Alam, Ex. Director, BBS and Mr. Mahboob-E-Alam, National Programme Officer, UNFPA also helped in improvement of the master plan. Dr. Syed Shahadat Hossain, Professor, ISRT, Dhaka University provided editorial support for the report.

I am deeply indebted to the contribution of officials of Statistics and Informatics Division (SID) and BBS who participated in the pilot test, consultation workshop and provided suggestions and comments to prepare the draft master plan.

Hope the users and readers will continue their suggestions and comments for further improvement of the draft master plan.

Dhaka, March, 2018

Md. Zahidul Hoque Sardar

Table of Contents

Section A: Assessment of Multi Modal Census

Chapter 1: Introduction	1
1.1 Introduction	1
1.2 Generic Concept of Census	2
1.3 Census in Bangladesh.....	3
Chapter 2: Prospect of Multi-Modal Census in Bangladesh	14
2.1 Experience of Other Country.....	14
2.2 Experience of Pilot Survey in Bangladesh	20
2.3 Possibility of Multi-Modal Census in Bangladesh	21
Chapter 3: SWOT for Multi-Modal Census in Bangladesh	23
3.1 Background	23
3.2 Strength, Weakness, Opportunity and Threat (SWOT) Analysis	24
Chapter 4: Policy Recommendations	27
4.1 Categories of Recommendations	27
4.2 Short term recommendations.....	27
4.3 Long term recommendations.....	29
Section B: Planning of Bangladesh Census 2021	
Chapter 5: Features of Multi-Modal Census	34
5.1 Response-maximizing approach	34
5.2 Tools for Computerized processing	35
Chapter 6: Framework of Multi-Modal Census	37
6.1 A paradigm shift in collecting and analyzing data.....	37
6.2 Multimodal Data Development.....	38
6.3 Recommendations for Census Organizational Structure	40
6.4 Framework of Multimodal Census and Surveys	40
Chapter 7: Proposed Multi-Modal Census 2021 by BBS	47

7.1 Planning: Master plan and sub-plan.....	47
7.2 Upgradation for 2021 and replication of 2011	48
7.3 Census Calendar.....	50
7.4 Cartographic Preparation.....	54
7.5 Pre-Census Activity	56
7.6 Publicity	61
7.7 Main Census Activities	62
7.8 Data Capturing and Processing	63
7.9 Editing Phase.....	63
7.10 Procurement of Equipment.....	64
7.11 Printing of Tables	64
7.12 Publication Plan	65
Annexure-A: Preliminary Cost Estimate.....	66



Section A

Assessment of Multi Modal Census

INTRODUCTION

1.1 Introduction

Population and Housing Census is the single most important statistical activities in any country, which plays an essential role in public administration, development planning and policy making. The importance of Population Census has been recognized in the SDG under goal 17. The target No-17.19 emphasizes on developing measurements complementing gross domestic product and supporting statistical capacity building in developing countries through at least one population census in every ten years time. More than eighty SDGs indicators require population data as denominator.

The basic feature of Population and Housing Census is to generate statistics on small geographic units and smaller population groups with no sampling errors. Such smaller unit of statistical information is highly important and useful as they can be used to produce statistics on any geographical unit with arbitrary boundaries. For instance, data of school-age children residing in surrounding areas gathered from population census would be helpful in planning the location of a school, which might not follow any administrative area boundary. Further, small area data from the census can be combined to approximate natural regions (for example, watersheds or vegetation zones) which do not follow administrative boundaries. Since census data can be tabulated for any geographical unit, it is possible to provide the required statistics in remarkably flexible manner. This versatile feature of the census is also invaluable for use in the private sector for applications such as business planning and market analyses.

The results of a census can be critically used as a reference to ensure equity in nationwide distribution of government resources and services. For instance, government funds get distributed and allocated based on census results among various regions and districts for education, health services. Further, census findings ensure proper allocation of social safety nets at the national and local levels after delineating electoral districts and appropriate measurement of the impact of industrial development.

The census results are used as a benchmark for research and analysis. Population projections are one of the most important analytical outputs based on census data. Further, census statistics are used as standard for statistical compilation or as a sampling frame for sample surveys. Without the sampling

frame and population benchmarks derived from the population and housing census, the national statistical system would face difficulties in providing reliable official statistics for use by the Government and the general public. A wide range of other users, including the corporate sector, academia, civil society and individuals, make use of census outputs, for their official use or research purpose. Population Census data is used for small area estimation using other data such as household income and expenditure, calorie intake to estimate poverty, inequality and other varieties for small geographic area.

1.2 Generic Concept of Census

Reliable and detailed data on population size, distribution and composition is inevitable for any planning and implementation regarding economic and social development, administrative activity or scientific research in any country. Population census, the primary source of such data, covers settled population, homeless persons as well as nomadic groups.

A population census is the total process of collecting, compiling, evaluating, analyzing and publishing or otherwise disseminating demographic, economic and social data at the smallest geographical level appropriate pertaining, at a specified time, to all persons in a country or in a well-delimited part of a country.

Similarly, a housing census is the total process of collecting, compiling, evaluating, analyzing and publishing or otherwise disseminating statistical data relating to the number and condition of housing units and facilities that as available to the households pertaining, at a specified time, to all living quarters and occupants thereof in a country or in a well-delimited part of a country.

Sufficient demographic, social and economic data concerning the occupants must be collected to furnish a description of housing conditions and also to provide basic data for analyzing the causes of housing deficiencies and for studying possibilities for remedial action. In this connection, data obtained as part of the population census, including data on homeless persons, are often used in the presentation and analysis of the results of the housing census, if both operations are conducted together or there is a link between them.

The essential features of population and housing censuses are individual enumeration and universality within a defined territory, as well as within defined periodicity and small area statistics.

Individual enumeration

The term “census” implies that each individual and each set of living quarters is separately enumerated and their characteristics are separately recorded. The data on the various characteristics also can be cross-classified by this procedure. The requirement of individual enumeration can be met by the collection of information in the field, by the use of information contained in an appropriate administrative register or set of registers, or by a combination of both these methods.

Universality within a defined territory

The census should cover a precisely defined territory (for example, the entire country or a well-delimited part of it). The population census should include every person present and/or residing within its scope, depending upon the type of population count required. The housing census should include every set of living quarters.

1.3 Census in Bangladesh

1.3.1 Brief Description of Censuses in Bangladesh

After independence in 1971, Bangladesh government re-organized the national statistical system by creating Bangladesh Bureau of Statistics (BBS). BBS was reformed by merging four statistical agencies working under different Ministries, namely, the Agricultural census and Bureau of Agricultural Statistics under Ministry of Agriculture, Population census under Ministry of Home and Bangladesh Bureau of Statistics under Ministry of planning. Since formation, BBS have been given the responsibility to conduct national Censuses, such as, Population census, Agriculture census, Economic census as well as periodic sample surveys to meet the data needs of the planners, policy makers and researchers in the context of Bangladesh.

Population and Housing Census 1974

The first census of independent Bangladesh was held in 1974 (Housing Census was conducted in 1973), as the 1971 Census could not take place due to the liberation war. Data collection was conducted between 10 to 28 February 1974, and the night of 28 February until dawn of 1 March was considered as census night. Usual residence and visitors who would not return before 28 February were enumerated. There were 19 districts where districts superintendent of census was deputed from government administration. There were 66 census districts, of which 62 were the then subdivisions and 4 were

largest municipalities, namely Dhaka, Chittagong, Rajshahi and Khulna. The number of administrative thana was 425 where a charge superintendent was appointed as census coordinator. There were 4350 Union Parishads, where a census circle supervisor was engaged. There were as many as 95208 census blocks where census enumerators were deployed from school teachers. The post enumeration check was conducted in 0.5% of census blocks, which numbered 482 and the estimated under enumeration rate was 6.88%. The data collection of 1974 was done in manual questionnaire and processing was done in mainframe computers.

Population and Housing Census 1981

In 1981, the population census was conducted between 6 to 8 March. Census moment was zero hours of 5 March night and 5 March night was considered as census night. The floating population was counted during the night of 5 March while usual residents and visitors who stayed on 5 March night were enumerated during 6 to 8 March following de-facto method. March 6 was declared as census holiday by the government for better coverage of census. For conducting census, 21 district coordinators were engaged from BBS who were mainly Deputy Director/Joint Director. As many as 71 sub-divisional coordinators were deployed in sub-divisional level. A total of 462 thanas was divided into 801 zones. One junior level statistician from Dhaka headquarters and thana offices were appointed as zonal officers. There were 2,04,362 Enumerators and 40,324 Supervisors to complete the task with a reserve pool of 5% enumerators and supervisors. Optical Mark Reader (OMR) questionnaire was used for the first time in 1981 census, data were captured in OMR machine and further processing and tabulation was done in mainframe computers. UNFPA provided technical and financial support for 1981 census. Post enumeration check was done immediately after main census and under enumeration rate was estimated as 3.10%. Census committees were formed in all administrative levels from district down to union/ward by taking representatives from government officials and public representatives of the respective areas.

Population and Housing Census 1991

The 1991 census was held during 12-15 March and night of March 11 was declared as census night for enumeration of floating population. For conducting census one national coordinator (DG/Secretary), 29 Regional coordinators for old districts were deployed from deputy directors and joint directors of BBS. For better monitoring and supervision, big regions (old districts) were divided into two regions. There were 94 district coordinators as the big districts were split into two or more districts resulting into the increased number of total census districts as 94. Statistical Officers/Assistant Statistical Officers

working in BBS head quarter and field offices were appointed as district census coordinators. There were 460 thana/upazila census coordinators deployed amongst the thana/upazila statistical officers. The whole country was divided into 1690 zones. A zonal officer from BBS head quarter and field offices were engaged. They were from upazila statistical officer/Statistical Investigator/Statistical Assistants/Junior Statistical Assistants etc. The number of enumerators were 2,11,538 and number of supervisors were 40,712. Census committees were formed in all administrative levels from district down to union/ward by taking representatives from government officials and public representatives of the respective areas. In 1991 census, data was collected using OMR questionnaire and data processing was done using microcomputers for the first time. Data from the OMR machine was transferred to microcomputers using laplink software for the first time in Bangladesh. Post enumeration check was done after the main census and the estimated rate of under enumeration rate was 4.61%. UNFPA provided technical and financial support in 1991 census.

Population and Housing Census 2001

The 2001 census was held during 23 to 27 January 2001, while midnight of 22 January was considered as census moment. From 0 hours to 5 am of 23 January was considered as census night. Usual residents and visitors who stayed on 22 January were enumerated during 23 to 27 January following de-facto method. For conducting census one National Coordinator (DG/Secretary), 8 Divisional Coordinators, 32 Regional Coordinators for old Districts were deployed from Director (Divisional level), Deputy Director and Joint Director (old Districts level) of BBS. For better supervision and monitoring, Administrative Divisions & big regions (old district) were divided into two Divisions/two Regions. The big Districts were split into two or more Districts totalling 119 census Districts, which were coordinated by 119 District Coordinators. Statistical Officer/Assistant Statistical Officer working in BBS field offices & head quarter were appointed as District Census Coordinators. There were 507 thana/upazila census coordinators deployed amongst the thana/upazila Statistical Officers. The whole country was divided into 2478 zones. A zonal officer from BBS head quarter and field offices were engaged. They were from upazila statistical officer/Statistical Investigator/Statistical Assistants/Junior Statistical Assistants etc. The number of enumerators were 2,62,000 and number of supervisors were 47,678. Census committees were formed in all administrative levels from district down to union/ward by taking representatives from Government Officials and public representatives of the respective areas. Post enumeration check was done after the main census and the under enumeration rate was estimated as 4.98%. UNFPA provided technical and financial support in 2001 census.

Population and Housing Census 2011

The 2011 census was conducted during 15 to 19 March 2011 when midnight of 14 March was considered as census moment. From 0 hours to 5 am of 15 March was considered as census night. During 15 to 19 March, usual residents and visitors staying on 14th March night were enumerated following de-facto method. For conducting census one Chief Coordinator (Secretary), one National Coordinator/Census Commissioner (DG), two Additional National Coordinator (DDG, BBS & Joint Secretary, SID) were deployed. The big Districts were split into two or more Districts, resulting in a total of 165 census Districts and 165 District Coordinators were appointed for monitoring and supervision. Director/Joint Director/Statistical Officers/Programmer working in BBS head quarter and field offices were appointed as District Coordinator. In addition Deputy Secretary/Senior Assistant Secretary from SID and Deputy Secretary Ministry of Public Administration (MOPA) were also appointed as District Census Coordinators. There were 530 thana/upazila census coordinators deployed amongst the thana/upazila Statistical Officers and Assistant Statistical Officers from head quarter and field level offices of other organization such as DAE, BRDB & Department of youth. The whole country was divided into 2800 zones, in each of which a zonal officer from BBS head quarter and field offices was engaged. They were from Upazila Statistical Officer/Statistical Investigator/Statistical Assistants/Junior Statistical Assistants etc. A total of 3,01,843 enumerators and 52,000 supervisors were deployed including reserved Supervisors and Enumerators. Intelligent Character Recognition (ICR) was used in 2011 for the first time. Integrated Computer Assisted Data Entry (iCADE) was used for data capturing and CSPro Software was used for data analysis and tabulation with the technical support from US census bureau. UNFPA provided support to census 2011 with funding from European Union. Census Committees were formed in all administrative levels from district down to union/ward by taking representatives from Government Officials and public representatives of the respective areas. Post enumeration check (PEC) was conducted for the first time by an independent organisation by Bangladesh Institute of Development Studies (BIDS) after the main census and the under enumeration rate was estimated as 3.97%.

1.3.2 Lessons Learnt from Population and Housing Census 2011 in Bangladesh

With the lessons learnt from each of the Census tasks, BBS took initiatives to improve the methodology of the next census and robustness of the census data. In the same way, the practical experiences gathered

from the Population and Housing Census 2011 can be summarised as below, which would set the background of deriving improved methodology for the next Census to be conducted in 2021:

Preparing Plan of Activities well ahead

There need to be a detailed plan of activities before implementing the large scale country wide census, at least 3 years before the actual census operation. The plan of activities would have narratives of each activity of every phase with appropriate time plan and need to be approved by the Census Standing Technical Committee. This plan also needs to be circulated among all the stakeholders for information and necessary actions. Such plan of activity would ensure timely completion of each of the project activities.

Technical Assistance for Population and Housing Census Operation

Involvement of a person with theoretical knowledge and practical experience of conducting census would be necessary. The role of such person would be to assist the Project Director, which would ensure smoothness in technical, conceptual and operational activities of the population census.

Preparation, Submission and approval of the Project

- I. **Consultation of the UNSD guidelines:** Population and Housing census in the Country is conducted following the UNSD guidelines. Before finalizing the Project Proposal and other documents, the UNSD guidelines need to be consulted. It requires local currency as well as foreign currency to conduct the population census operation. Under the UN financial support/assistance, required fund needs to be accumulated timely for smooth and timely completion for each of the laid tasks. Such initiative needs to be taken at least 3/4 years before the communication and discussion with the development partners should be initiated, so that the required fund need to be available in time.
- II. **Allocation of Fund in Time:** As Census is a time bound work, every phase of its activity needs to be completed within the stipulated time. Therefore, sufficient fund allocation needs to be made available accordingly.
- III. **Procurement of Logistics and Supply:** The necessary logistics and supply needs to be procured in time to avoid difficulty in timely operation of the Census work.
- IV. **Updating the Mauza/Mohalla:** During Zonal operation the concerned Zonal Officer needed to update the features of all Mauzas/Mohallas within his zone irrespective of the habitation status.

The Upazila Census Coordinator or Upazila Statistical Officers (USO) collected all the Mauza lists from Zonal Officers to consolidate for his concerned Upazila. The USOs confirmed the list in consultation with the Assistant Commissioner (Land) who identified the Mauzas which are populated, depopulated, river eroded, under forest, under water, etc.

- V. **Arrangement of Unique Training:** A unique training system for the Enumerators, Supervisors, Zonal officers and Coordinators was developed using Audio-Visual tools to maintain uniformity of the training at all levels.

Census Operation Activities

- I. **Checking of Census Books:** After receiving all the filled in Census Books in the Control Room at the headquarter a thorough checking need to be done with the help of Zila/Upazilas wise EA list and find out whether Census Book of any EA is left out or missing.
- II. **Consistency checking of the geographical units:** As soon as the census data are captured and computer run are printed as per approved tabulation plan, consistency checking needs to be done to find out whether population of any Zila, Upazila, union, Mauza or village has reduced as compared to the immediate previous censuses using proper geo-code.
- III. **Consistency checking of the tables:** Consistency checking of tables (within the tables), smoothing of data and logical checking needs to be done before finalization of the tables.
- IV. **Separate Tally Sheet:** Filling out of Tally sheet irrespective of EA or Merge EA need to be done separately.
- V. **Data capturing and cleaning:** In the 5th population and Housing census, data capturing was done using latest Integrated Computer Assisted Data Entry (ICADE). But this is not continued for the next activities as the software is not available with BBS. The agency who helped in ICADE did not transfer the technology to BBS due to different reasons. Therefore, when any latest technology is used, the continuations need to be ensured.
- VI. The EA size should not be varied widely. This will be helpful for preparing sampling frame using of EA size created complicacy in preparing sampling frame in 2011 census.

Dissemination of Census Result

Experience of the 5th Census showed that data were cleaned and prepared within 15 months after the Census. But data were released for community reports. The users are interested in national reports. Therefore, online tables for the nation as a whole, disaggregated by urban rural, division and districts could be released first. The other reports could be released subsequently.

1.3.3 Challenges

The following challenges were emerged from the population census 2011 operation, which was presented in a national level consultation meeting and was subsequently approved by the Census Technical Committee:

- a) **Difficulty to access households in urban settings:** There was difficulty to collect data from the urban areas, particularly in the high rise buildings. Due to security reason, the caretaker or guards at the gate of such buildings prohibited entry into the building. Sometimes enumerators had to collect data from the gate and information was given by the caretakers or by telephone call from the gate. In such cases, quality/accuracy of data could not be ensured. Sometimes data are collected from guards/gatekeepers/other household members without informing respective head of households. As a result the household head complained this issue as non coverage.
- b) **Difficulty to estimate areas in different level:** In some cases, total area of the Upazila and Zila were not similar to the other sources such as district administration, land office. This discrepancy of area at the sub-national level needs to be minimized.
- c) **Difficulty to contact head of the household/knowledgeable member:** Data needs to be collected from a member of the household who have better knowledge to avoid inaccuracy of data. In some cases it was difficult to get the most knowledgeable member (usually the head of the household) of the household during data collection, such as, during day time, the head of the household was out of home for work. Also, in high-rise buildings of urban areas, accessibility was a problem.
- d) **Limited campaign of population census:** In 2011, publicity for the Census was limited to the print and electronic media only, which might not be accessible to the mass people, in particular remote areas. Duration of publicity and coverage need to be increased to so that most of the people become aware of the importance and benefit of census.
- e) **Difficulty to maintain uniformity of the training to field staff:** Although it was planned, it was difficult to keep uniformity in the trainings provided to the field staff, particularly, to the zonal officers, supervisors and interviewers using audio-visual tools. It was not always possible to train the uniform method of field operation to the field staff. Multimedia was also not possible to use everywhere.
- f) **Difficulty to transfer modern technology and knowledge to BBS:** In 2011 census, updated ICADE technology was used to capture the census data which is a time saving technology to

capture data with higher accuracy level. However, the final source code was not handed over to BBS by the contracting firm, who are based in abroad.

- g) **Transferring Project Director during project period:** The Project Director (PD) acts as the captain of a ship. Therefore, having the same person as PD during the project period would ensure retention of the knowledge from the planning phase till the completion of the task. Changing PD during the project period jeopardizes the continuity of work and timely submissions of outputs.
- h) **Interruption in Fund flow:** As census is a time bound work its every phase of activity needs to be completed within the stipulated time. Therefore, sufficient fund allocation with timely disbursement needs to be ensured.

1.3.4 *Recommendations*

The following strategic points are recommended to be implemented in next census to improve the methodology of the census in order to increase the accuracy level of the census results.

- 1) **Updated method of data collection:** Multi-Modal approach of data collection can be experimented before 2021 census. The different modes of data collection may be explored, which include computer assisted personal interviewing (CAPI), mobile/web- application, and computer assisted telephone interviewing (CATI), etc. In the city area, self-administered questionnaire (drop and pick) may be introduced in case the enumerators fail to collect the information through face to face interview because of the absence of head of household and or other barriers due to security point of view. However, after exploring different alternatives, the stakeholders' consultation will be necessary to finalize the system.
- 2) **Use higher coverage of Census publicity:** Wide scale publicity of census plays a significant role to get accurate data from the respondents. To reach every corner of the country and every class of population, Publicity of population census needs to strengthen and wider coverage. Suggested strategies are:
 - increase of duration of timing in the electronic media with all channels
 - more coverage in print media with features, advertisement
 - use of social media (Facebook, twitter, etc.) as publicity modality
 - sending mail and SMS to all the users

- census publicity should be made through BTV and different National and International private Bangla TV channels.
- 3) **Ensure transfer of modern knowledge to BBS:** If any contractual is outsourced to the other organization for census operation, the terms and condition should include the following: ‘Whatever the technology uses, it should be transferred to BBS after census operation’. It will ensure that transferring modern technology to BBS. Authority should also be careful to check whether the technology is transferred to BBS (capacity, application, source code etc.) before final payment.
 - 4) **Imparting training with modern devices:** Field level training of enumerators and supervisors is a gigantic task and it is a challenge to provide uniform training all over the country. A standard module of training can be prepared in audio-visual format with practical examples how to collect the data, rapport building etc. This audio-visual training can be given using multimedia and uniformity of the training can be ensured.
 - 5) **Formation of a sub-national level committee to resolve area related issue:** A sub-national level committee (district, Upazila) needs to constitute to resolve the discrepancy of the total area of district and Upazila. This committee will provide suggestions how to provide uniform total area of the Upazilas and Zilas. The committee can be headed by DC in the Zila and UNO in the Upazila level.
 - 6) **Interaction to the local representative, housing association:** More interactions can be established to resolve the data collection issue in the urban areas. Formal communication can be established to the housing authorities, local elected representative to seek cooperation for the accurate data collection. Here, issuance of official letters, formal meeting with them could be the possible means of interaction.
 - 7) **Involvement of more female interviewers/supervisors in the data collection:** From the practical point of view, it was observed that the data was collected mostly from the female members of the family as men are away from home due to economic activities. Sometimes, female members were alone in the day time at home. So, they feel sometimes embarrassing to provide data if a male interviewer was there or not allowed them to enter in the house that time. Therefore, more female interviewers can be hired to collect information to resolve the above issue. Even interview team can be formed with one male and one female who will count 2

enumeration areas. In such a way, accuracy of data can be improved with same cost of interview. If female is not available, only then male can be hired.

- 8) **More dialogues with the users at national and sub-national level:** User-producer dialogue is useful means to map the depth of analysis, to identify the needful of data at various level and form, and to find out the issues to be taken care of. Notion of data use by the national level policy makers and at the micro level users are different. Hence more user-producer dialogue can be organized from national to the Upazila level at the planning phase census.
- 9) **Integrate census undertakings with the objective of preparation of the population register:** Initiatives have been taken to prepare a population register in BBS where the basic information of all the population of Bangladesh will be stored. Population census could be planned in such a way that the proposed project can use the basic data of population census to upgrade or verify their database. Such as population in a village or Mahalla in population census should be equal to their database in that area. Even the census result can be used to update their database. Bridge plan can be adopted to get synergies of the census data through these two vital activities, population censuses and developing database of population register in Bangladesh.
- 10) **Documentation of Census reports and Digitization:** Documentation of census reports is a prime task of BBS. Including population census 2011, five censuses have been conducted after independence of Bangladesh. Presently, no documentation procedure has been adopted to archive these valuable reports. Due to lack of proper documentation of earlier censuses reports, it is difficult to get some of the reports. It is observed that some of the earlier reports have been lost or not known to place of availability. These valuable reports are useful to write the current census reports, to understand the methodological or definitional change, to show trend analysis of population. Even planners, researcher, students needed these reports regularly.

A well-furnished set up is needed to archive all the published reports of the last five population censuses and standard catalogue system should be introduced. Digitization of these reports and other valuable documents are needed abreast with archiving activity. Because the quantity of reports are increasing and spacing problem increases to archive them. Digitization would also ensure the protection of the reports even if the hard copies are lost due to any unavoidable circumstances. Population census authority could lead the activity during the interim period

between censuses. All the digitized reports can be uploaded to the website of BBS for wider use of census results.

- 11) **Provisional reports can be uploaded in the website for the users before finalization:** As the country is heading to total digitization, initiative can be taken to upload the provisional reports (national, district, community) in the website of BBS. Keeping in the ground reality that it would sometimes be required to have much more time to finalize the reports by following all the standard procedures, such as reviewing, clearance from the technical committee, final clearance by the authority to print.

- 12) **Appointment of Two Deputy Project Directors:** Population Census is one of the biggest and longest activities of BBS. There need sufficient and skilled project management team. To assist the Project Director, two Deputy Project Directors (DPD) need to be appointed so that no casualty can interrupt the work of the Project in absence of the PD. One DPD will look after the financial matter and another will look after field operation and technical aspects.

PROSPECT OF MULTI-MODAL CENSUS IN BANGLADESH

2.1 Experience of Other Country

2.1.1 The Internet as a Data Collection Mode in the Census

Traditionally people could reply to the Census through either self-enumeration by a paper questionnaire or face-to-face with a Census enumerator. The introduction of an online mode is a further method of self-enumeration.

The 2010 round of population and housing censuses witnessed a rise in the use of the internet for data collection. Of the 138 countries or areas that responded to the United Nations, 32 (23 per cent) utilised the internet for data collection

Table 1 shows the proportion of Census returns made online for a selection of countries. The take-up of the internet response mode is shown for the first Census in which it was offered regardless of the actual year in which the Census took place.

In 2011, 15 per cent of Northern Ireland Census returns were via the internet. At the time 71 per cent of households in Northern Ireland had internet access. The large differential between online responses and the level of internet access indicates that there is significant potential to increase online Census returns in 2021.

Table 1: Proportion of Census Returns via the Internet First Census in Which an Online Response Mode was offered

Country	Percentage of Census Returns made via the Internet – First Census to allow online return	Date of Census
Northern Ireland	15	2011
England & Wales	16	2011
Canada	18	2006
Australia	9	2006
New Zealand	7	2006
Kuwait	15	2011
Portugal	50	2011
Singapore	15	2000

2.1.2 Benefits of an Internet Data Collection Mode

This section of the report examines the benefits that an internet data collection mode may bring. Benefits cover such areas as cost, data quality, respondent burden and data privacy and security. Census developments will not happen in isolation, indeed the nature of an online data collection mode makes it possible to develop a base model that can be modified for a specific survey other than the Census with relatively low marginal cost. The benefits outlined in this section are made between a paper based environment and the working assumptions on the delivery of Census 2021 which include an online response mode in Northern Ireland.

A face-to-face interview provides the most accurate survey responses. An interviewer is there to guide the respondent through the questionnaire ensuring answers are appropriate. However face-to-face is the most expensive data collection mode. It is hoped that an internet mode will provide a level of accuracy tending towards that which a face-to-face interview would provide at a lower cost.

It would seem intuitive that responding to a survey by the internet would automatically reduce the cost. However there is no guarantee that increasing the proportion of Census returns made via the internet automatically leads to a reduction in cost. The initial set up, fixed costs, to develop an internet mode are significant. A critical number of returns is needed in order to realise a cost saving. Canada estimated that internet returns in 2011 would need to be in the region of 35-40 per cent to realise a cost saving. In fact in 2011 Canada achieved an internet returns rate of 54 per cent.

The position in Northern Ireland will be affected by whether Northern Ireland Statistics and Research Agency (NISRA) runs a separate operation in Northern Ireland or, as in 2011, participates in a joint operation with ONS. If NISRA runs a separate operation, it is likely that a higher number of online returns would be required to cover the fixed costs associated with independently developing an online response mode than if NISRA, in partnership with ONS, develop an online response mode.

The need to maximize cost savings in an area where savings are not guaranteed would rationalize the option to provide an online response option for the wider NISRA survey programme. There is also a need to future proof, as far as possible, the online response mode in order that the platform could be used beyond 2021 in order to maximize cost savings.

Statistics Canada suggested that the method can have further cost savings through a) reduced postage, b) reduced mail-back and registration of paper questionnaire, and c) reduced item non response, which was achieved by making core questions mandatory. In addition, Statistics Canada further identified benefits, in relation to, high quality data, low item non – response, simplified processing of returns, data in machine readable format; and environment-friendliness. Further, ONS expect cost savings in light of an internet mode to be associated with reduced calls to the contact centre for help, savings in paper scanning/capture; and speedier capture of data. Online data capture removes scanning error which can be subject to issues such as illegible handwriting.

The US Census Bureau envisages, when the US short form Census goes online in 2020, cost would be saved due to reduction in printing, mailing and data capture.

2.1.3 Experiences of Thailand's 2010 Multimodal Population and Housing Census

Thailand's first Population Census was conducted in 1909. Since 1960, the National Statistical Office (NSO) has been responsible for administering the Population Census every 10 years. The latest Population and Housing Census was carried out in April 2000 and Intelligent Character Recognition (ICR) technology was first implemented for data capturing.

In 2010 NSO celebrated its 100th anniversary. NSO is also promoted in the media such as announcement in newspapers, broadcast by community radio stations and television, poster drawing competition, census logo and slogan contest include distributing promotional calendar of Census 2010 and selling memorable stamps. Two pilot census tests were conducted: one in 2008 in the Phitsanulok province (Northern) and the second in 2009 in Bangkok. The objective of the pilot tests were to test all

stages – (preparation and planning, data collection, data processing and data analysis and dissemination) which were the lessons learned for planning the 2010 Population and Housing Census. NSO has signed a memo of understanding (MOU) with the related agencies and also cooperate with Department of Provincial Administration by using area Database.

The 2010 Population and Housing Census has been assigned on 1st – 31st July. To prepare for this process, the NSO has planned to provide advance technological data capturing. Best practices and also others different technology methods are investigated and exploited.

Below is the experience of Thailand in 2010 population and Housing Census which can be very useful for planning 2021 population census of Bangladesh.

The multi-modal collection methods to be used for data collection are as follows:

- (a) Data capturing: Intelligent Character Recognition (ICR);
- (b) Internet;
- (c) Telephone Interview Center (TIC).

Data capturing: Intelligent Character Recognition (ICR)

Lesson learned from using the ICR System from previous the 2010 Population and Housing Census is indicated below:

Advantage	Disadvantage
Suitable for large-scale Census, release data more rapidly	Strictly designed questionnaire : Size, paper, color, figure and answer boxes
Reduce time and cost of data processing	Record questionnaire should be used fixed pencil (H2B)
More accurate and reliability for data Capturing	Handwriting quality was below expected/ poor handwriting
poor handwriting Image of questionnaires stored on CD/DVD was convenient archive and Retrieve	To collect / distribute and return questionnaire should be done with caution

ICR System

Questionnaires workload which the number of population in 2010 is around 19 million households (76 million sheets: A4 paper size). The transfer data plan was assigned in each region / provinces for 3 months. Each province need scan questionnaires after finishing fieldwork 2 weeks - 1 month. The

dropping out form (reducing the images size) was transferred to center office via internet. The transfer speed is estimated 5-10 Mbps and the average hour of each province is 2-7 hours and also the largest province is 20 hours.

To determine the degree of efficiency and good practice, the questionnaires have been designed to use specific marks to map each page (reference marks, bar codes etc.) on every page which can gain in quality of scanning and reading times.

Internet

Internet data collection is an alternative for self-enumeration. The objective is to decrease coverage error, providing a way to get at hard-to-enumerate households. Web-based data entry is designed for self-enumeration on internet. It is an alternative for self-enumeration that the respondent can be accessed. The NSO is providing this for the first time for 2010 Population and Housing Census to be more convenient for the respondent to complete the questionnaire within the scheduled time frame. The internet target is user-friendly, reliable, unbiased and confidential.

Propose enumeration by internet is providing a way to get at hard-to-enumerate households, save costs in data collection, have high efficiency, improve data quality and achieving the maximum survey response rate.

The benefits of internet data collection are accurate and timely data collection and reduction in the processing time. Internet provides rapid availability of clean data for statistical analysis.

Telephone Interview Center (TIC)

The NSO also plans to use for the first time the computer-assisted telephone interviewing (CATI) technique that the interviewer reads the question developed on the computer screen and records the respondent's answers directly into the Web-based Data Entry.

Regarding limited connecting network at peak times during the census period, software applications of Web-based Data Entry for 2010 census was outsourced. However, the specific outsourcing issues are detailed and managed. NSO's IT team would be evaluated to ensure the understanding of requirements for timeliness, quality assurance, data confidentiality and security.

Data Management

To aggregate the completeness cleaned data of 2010 Population and Housing Census from multi-sources before transferring to databases, standard databases platform have been provided to Data Warehouse, Data Lab, NSO-GIS. Integration Databases of 2010 Population and Housing Census are consists of three layers:

- A production layer are gathered with Statistical data, Database and Metadata
- A storage layer where Data Warehouse, Web Services are stored
- A dissemination layer are produced Statistical publication and online/offline interactive statistical products.

NSO has planned to link the Population Census database to the Government Strategic Information Center (GSIC) to support the government agencies, private sectors and disseminate the knowledge through the NSO Website.

Government Strategic Information Center (GSIC)

The Cabinet approved the implementation of the SGIC in 2004. The aim was responsible for administration and integrating all country data levels included government in the provincial area. It also supported data for administration to Prime Minister Service Center.

Value chain of GSIC

To encourage and exchange information among related agencies included government, private sectors and people. To consider the data supply side and demand side as below:

There are 5 steps in the Value chain of GSIC

- (1) Data Compilation: To integrate statistical data from every sources. Thailand's statistical system is a dispersed system so that the standardized mechanism for gathering statistical data is necessary for processing and analysis;
- (2) Clustering and indexing: To group and categorize statistical data from different sources;
- (3) Quality Assurance: To check the quality of information and accuracy in accordance with standard exchange through standard statXML;
- (4) Information: To present with the easy format with enable advanced usage analysis;
- (5) Intelligence: To develop the intelligence information for high level administrators to present the various effectiveness analytical information that support for Cabinet decision making and point period problems.

Recommendations Based on Thailand's Experiences:

- Following the experience of Thailand for Multimodal Census in 2010. Bangladesh could pilot the similar method before finalizing the method of enumeration in 2021 census.
- As use of mobile/tab/internet technologies are increasing rapidly in Bangladesh, Mobile/tab/internet application for data collection in the main census can be explored.
- Before nationwide pilot, expert consultation can be held where mobile operators and ICT experts can be invited to share the ideas.
- A master plan with detailed break-up of pre-census, during census and post census activities for the next census should be ready by 2017 for effective undertaking of the census
- The next round census of population and housing will be an important undertaking to generate some SDG indicators which may not be possible to generate at the disaggregated level by surveys.
- Modern devices should be used in data collection; training and publicity.
- BBS can explore the possibility of the using different ICT technology in the next round of census.

However, for remote areas, such technology might not be suitable. Therefore multi-data collection system including ICR Questionnaire can be explored. Before finalization of the data collection system, consultation with the stakeholders will be very useful.

2.2 Experience of Pilot Survey in Bangladesh

The first pretest on multimodal census was held during 5-10 October 2016. Eight Enumeration Areas (EA) of Population Census-2011 were selected for Multimodal Census from each divisions of the country including the newly declared Mymensingh Division. Out of 8 (Eight) EAs four were in the urban areas and four were in the rural areas. The households were listed first and then questionnaire were canvassed to those households. The total number of households obtained in the pre-test was 821. The highest number of households was observed in Rangpur Sadar (City Corporation) where the lowest was observed in Netrokona of Mymensingh Division.

Almost all of the households have access to mobile facility (99.4%). E-mail account was found for 47 households (5.7%), while 170 households (21.8%) reported that they use e-mail though mobile/Tab. Further, 53 households (6.5%) reported to use e-mail through computer and 1.0% use union digital

centre for e-mail. The response seems confusing as those who reported to use through mobile/Tab or UDC they must have e-mail address. But the number of reported e-mail users seems high than those who have e-mail address.

The other Socio-economic characteristics of the households covered through the questionnaire survey shows better position than previous census. It is mentionable that the last census was held in 2011 and the pre-test in 2016. During this period considerable programs have been implemented in case of electricity, sanitation, housing structure etc. However, the average size of household obtained from the pilot is 4.2, which is reasonable and compares well with recent BBS recent surveys. The sample size of 821 households may not be representative of the country as a whole. Therefore, more pre-test and pilot will be necessary to come into conclusion and using modes for responses.

In the pilot, all of the questionnaires were filled-up using face to face interview. Therefore feasibility of using other modes is difficult to ascertain. Even household having access to internet may not be interested to response through e-mail. Therefore, actual number of households willing to use different modes need to be tested before finalizing the multimodal approach of data collection in 2021 census. The questionnaire and findings are provided in annexures.

2.3 Possibility of Multi-Modal Census in Bangladesh

While ICR based census experienced in the earlier Bangladesh censuses posed few disadvantages and use of multi-modality in other countries showed advantageous prospects, it is imperative that Bangladesh explore the prospect of a multi-modal census for 2021. With a total population of approximately sixteen crores and an urbanization of 30%, Bangladesh is experiencing a rapid growth in active internet users. As at the end of 2016, the number of social media user has raised to 1.5 crores supplemented by a 13.44 crores of mobile connection. This ICT setup clearly paves an opportunity for Bangladesh to blueprint a multi-modal census for 2021. A sufficient pre-census preparation including technical assistance, procurement of logistics and supply and detail training system for the human resources will be a requirement for such a venture for 2021. Execution of an updated method like multi-modality in data collection will also need usage of higher coverage of census publicity including print, electronic and social media; more dialogues with the users at national and sub-national level and digitized disseminations and documentation. The census core team may visit to some countries to share their experience on multimodal census.

Census wing of Bangladesh Bureau of Statistics (BBS) is considering electronic data collection to meet the rising users' expectations, to reduce data entry/data capturing time and resources and to match up with the recently evolving ICT tools for data extraction, manipulation, and analysis. This would potentially a Paradigm shift in collecting and analyzing data as it will eventually mitigate most of the following drawbacks the traditional surveys used to face:

- Increasing expense,
- Declining response rates,
- Lengthy time lags between data gathering and publishing indicators and other statistics.
- Lack of adoption of rapidly changing tools for data extraction, manipulation and analysis and expanding sources of knowledge generation and innovation.

In the following chapter, a Strength, Weakness, Opportunity and Threat (SWOT) analysis of the prospective multi-modal census 2012 and a detailed purview of the planned multi-modality is presented.

SWOT FOR MULTI-MODAL CENSUS IN BANGLADESH

As described in the previous chapter, a multi-modal census for Bangladesh in 2021 would need to address numerous issues. These issues include both prospects and challenges which are discussed in the following sections.

3.1 Background

3.1.1 Wide-spread ICT usage in Bangladesh as on January 2016

As already mentioned that Bangladesh is experiencing a rapid growth in active ICT usage, the following data can give a glimpse of the situation.

Total Population = 16.0 Crores (Approx.)

Urbanization = 30%

Active Internet User = 5.39 Crores and its Growth = 33%

Active Social Media User = 1.5 Crores

Mobile Connection = 13.44 Crores and its Percentage of Total Population = 83% (Latest data will be high, HIES should more than 92.0% hh have access to mobile)

Active Mobile Social Media User = 1.3 Crores and its Growth = 9%

3.1.2 Pre-Census Activities

Under this ever mounting ICT framework of the country, a multi-modal census will require to undergo huge pre-census activities, which would include:

- Administrative control unit of 2021 census are to be upgraded with recent data. Mauza list marking populated and depopulated is to be updated and accordingly Mauza map and geocode database should be upgraded. Number of enumerators and supervisors will be needed to be determined based on the methodology of data collection.
- Preparation of plan of census operation should be done at least 3 years before the actual census.
- For technical assistance for population census operation, highly trained personnel having theoretical and practical work experience on census needs be involved as local consultant to support the core team.

- Detail training plan for a unique training system for the Enumerators, Supervisors, Zonal officers and Coordinators are essential.
- Project proposals should be prepared and get approval timely to get fund and technical assistance and thereby allocation of fund should be done in time.
- Plan for procurement of logistic are to be done.

3.1.3 Challenges

With the above to-do list at the pre-census stage, following practical challenges are to be kept in mind:

- Difficulty to collect data from the urban settings
- Difficulty to estimate areas in different level
- Data provided by the less knowledgeable member/person of the household
- Less priority of advocacy and publicity of population census
- Loss of uniformity of training to the field staff
- Difficulty to transfer modern technology and knowledge to BBS
- Transferring Project Director during project period
- Delaying of fund release
- Develop the census framework before the actual census so that use of census framework can be quite easy.
- Finalize the method of multimodal data collection.

3.2 Strength, Weakness, Opportunity and Threat (SWOT) Analysis

From the light of other countries experiences on multi-modal census, the existing capacity of the census wing and the cutting edge technological development in the world, a critical SWOT analysis has been carried out.

Strength	Weakness
i) Moderately long history of censuses in Bangladesh contributing to a versatile experience for the census authorities.	i) Difficulty to access and collect data in some urban settings, ii) Difficulty in demarcation of areas in different level or denomination,

<ul style="list-style-type: none"> ii) Set goals in SDG, paving to identified indicators to be focused for the census iii) Recognized and institutional infrastructure for carrying out census activities. Census wing of BBS is delegated with the responsibility. iv) Availability of statutory support in established Statistics Act, 2013 and detailed NSDS. v) Approved standing committees for census are functional at national and sub-national levels. vi) Availability of interaction with the local representative, housing association vii) Possibility of involvement of more female interviewers/supervisors in the data collection viii) Rapidly growing ICT usage scenario in Bangladesh ix) Planning well ahead in time. 	<ul style="list-style-type: none"> iii) Difficulty in maintaining uniformity of training to the field staff, iv) Vulnerability of Administrative rearrangement (transfer, promotion, leaving of trained officer to administration, etc.) during and before census, v) Lack of interchanges with the users at national and sub-national level, vi) Shortage of human resources skilled in highly digitized data both from methodology and analytics perspectives, vii) Lack of regular human resource in BBS both in headquarters and fields, viii) Absence of digitized documentation of census reports,
Opportunity	Threat
<ul style="list-style-type: none"> i) Availability of advanced modes of data collection and feasibility of a multi-modal methodology, 	<ul style="list-style-type: none"> i) Lack of awareness and knowledge of the respondents ii) Difficulty to transfer modern

<ul style="list-style-type: none"> ii) Prospect of using higher coverage of census publicity in enhanced number of print, electronic and ICT media, iii) Scope of transfer of modern knowledge and training with modern devices to BBS iv) Scope for sub-national level involvement to resolve area demarcation related issues v) Aim for preparation of the National Population Register (NPR) it may be integrated with census outcomes, vi) Digitization of documentation of Census reports can open up the possibility of getting feedback from users and stakeholders at interim phases of report preparation. vii) To overcome the difficulty of collecting data from urban settings improved and rigorous strategic planning is under active consideration. 	<ul style="list-style-type: none"> technology and knowledge to BBS iii) Uninterrupted resource flow might not be ensured. iv) Acceptability of census results.
--	---

4.1 Categories of Recommendations

The lessons learned from the Census 2011 and previous censuses along with the experience of the utilization of ICT in censuses in other countries are summarized and synthesized to come up with few policy recommendations for a master plan of a possible multi-modal census in Bangladesh in 2021. The SWOT analysis carried out in the previous chapter also is used as sources of these recommendations while physical description of the possible multi-modal census given in Chapter 4 are used as targeted activities required for the multi-modal census.

The recommendations are categorized in two facets:

- a) Short term or immediate plan, particularly imperative for the pre-census activities;
- b) Long term or future plan, including the very implementation stage and the post census activities.

4.2 Short Term Recommendations

Following are the detailed recommendations for Short Term Plan:

- As use of mobile/tab/internet technologies are increasing rapidly in Bangladesh, Following the experience of Thailand Mobile/tab/internet application for data collection can be planned for Multimodal Census in 2010. In this back-drop, Bangladesh could explore the possibility similar method before finalizing the method of enumeration in 2021 census. BBS can pilot such using different ICT technology in the next round of census. However, for remote areas, these technology may not suitable. Therefore multi-data collection system including ICR Questionnaire can be explored.
- Noteworthy that, a very small piloting exercise has been conducted by the BBS during early 2017, which also recommended that more detailed pre-test and pilot study will be necessary to come to conclusion on preferable modes for different types of respondents. However, in the pilot

study carried out, all the questionnaire were filled-up using face to face interview. Therefore, feasibility of using other modes is difficult to ascertain. Even household having access to internet may not be interested to response through e-mail. Therefore, actual number of households willing to use different modes need to be estimated before finalizing the multimodal approach of data collection in 2021 census.

- Before nationwide large scale pilot, expert consultation can be held where mobile operators and ICT experts can be invited to share the ideas.
- If an updated method of Multi-Modal data collection is to be employed in the 2021 census,
 - A master plan with detailed break-up of pre-census, during census and post census activities for the next census should be ready by 2017 for effective undertaking of the census.
 - Higher coverage of census publicity is needed to be ensured by increasing the duration of print electronic and social media campaign with more outlets,
 - More coverage in electronic media with features, advertisement,
 - Transfer of modern knowledge and training with modern devices to BBS is to be done,
- To overcome the difficulty in collecting data from the urban settings, particularly in the high rise buildings, prior arrangement with the housing associations and Real Estates Housing Association in Bangladesh (REHAB) should be made. Issuance of official letters, formal meeting with them could be the possible means of arrangement. This issue should also be incorporated in the training materials of the interviewer.
- The demarcation of the administrative units like Upazila and Zila has discrepancy among the records of different sources such as district administration, land office. This discrepancy of area at the sub-national level should be minimized, possibly by accommodating some of these agencies at the zonal operation level.
- Data should be collected from a member of the household who have better knowledge (traditionally the household head) otherwise the likelihood of inaccuracy of data would rise. For this purpose, awareness should be campaigned for the early pre-census activities.
- In some cases it was difficult to get the most knowledgeable member (usually the head of the household) of the household during data collection. For example, during day time most of the head of the household were busy in work and away from home and also in case of urban areas in high rise buildings as mentioned earlier.

- The Census 2011 experienced that it was not possible to train the uniform method of field operation to the field staff. The approach to provide verbatim training to the field level, in particular the zonal officers, supervisors and interviewers should be avoided in the Census 2021. A standard and uniform training should be planned.

4.3 Long Term Recommendations

The following strategic points or long term plan are suggested to be implemented in next census to improve the methodology of the census in order to increase the accuracy level of the census results.

- **Updated method of data collection:**

Multi-Modal census can be experimented before 2021 census. Under this system different modes of data collection may be explored, which include computer assisted panel interview, drop and pick, and computer assisted telephone interview etc. In the city area, Mailing Census may be introduced on test basis as the enumerators could not collect the necessary information correctly because of the absence of head of household and or other barriers due to security point of view. However, after exploring different alternatives, the stakeholders' consultation will be necessary to finalize the system.

- **Ensure transfer of modern knowledge to BBS**

The next round of population and housing census will use modern devices in data collection; training and publicity. If any contractual is outsourced to the other organization for census operation, the terms and condition should include the following: 'Whatever the technology uses, it should be transferred to BBS after census operation'. It will ensure that transferring modern technology to BBS. Authority should also be careful to check whether the technology is transferred to BBS (capacity, application, source code etc.) before final payment.

- **Imparting training with modern devices**

Field level training of enumerators and supervisors is a gigantic task and it is a challenge to provide uniform training all over the country. A standard module of training can be prepared in audio-visual format with practical examples how to collect the data, rapport building etc. This audio-visual training can be given using multimedia and uniformity of the training can be ensured.

- The duration of training should be increased with exclusively one day for field demonstration.

- **Involvement of more female interviewers/supervisors in the data collection**

From the practical point of view, it was observed that the data was collected mostly from the female members of the family as men are away from home due to economic activities. Sometimes, female members were alone in the day time at home. So, they feel sometimes embarrassing to provide data if a male interviewer was there or not allowed them to enter in the house that time. Therefore, more female interviewers can be hired to collect information to resolve the above issue. Even interview team can be formed with one male and one female who will count 2 enumeration areas. In such a way, accuracy of data can be improved with same cost of interview. If female is not available, only then male can be hired.

- **More dialogues with the users at national and sub-national level**

- User-producer dialogue is useful means to map the depth of analysis, to identify the needful of data at various level and form, and to find out the issues to be taken care of. Notion of data use by the national level policy makers and at the micro level users are different. Hence more user-producer dialogue can be organized from national to the Upazila level at the planning phase census.
- The next round of population and housing census will be an important endeavor to generate some SDG indicators which may not be possible to generate at the disaggregated level by surveys.

- **Integrate census undertakings with the objective of preparation of the population register**

- Initiatives have been taken to prepare a population register in BBS where the basic information of all the population of Bangladesh will be stored. Population census could be planned in such a way that the proposed project can use the basic data of population census to upgrade or verify their database. Such as population in a village or Mahalla in population census should be equal to their database in that area. Even the census result can be used to update their database.
- Bridge plan can be adopted to get synergies of the census data through these two vital activities, population censuses and developing database of population register in Bangladesh.

- **Documentation of Census Reports and Digitization**

- Documentation of census reports is a prime task of BBS. Including population census 2011, five censuses have been conducted after independence of Bangladesh. Presently, no documentation procedure has been adopted to archive these valuable reports. Due to lack of proper documentation of earlier census reports, it is difficult to get some of the reports. It is observed that some of the earlier reports have been lost or not known to place of availability. These valuable reports are useful to write the current census reports, to understand the methodological or definitional change, to show trend analysis of population. Even planners, researcher, students needed these reports regularly.
- A well-furnished set up is needed to archive all the published reports of the last five population censuses and standard catalogue system should be introduced. Digitization of these reports and other valuable documents are needed abreast with archiving activity. Because the quantity of reports are increasing and spacing problem increases to archive them. Digitization would also ensure the protection of the reports even if the hard copies are lost due to any unavoidable circumstances. Population census authority could lead the activity during the interim period between censuses.
- All the digitized reports can be uploaded to the website of BBS for wider use of census results.

- **Provisional reports can be uploaded in the website for the users before finalization:**

As the country is heading to total digitization, initiative can be taken to upload the provisional reports (national, district, community) in the website of BBS. However, there may be some change in the final version which should be borne in mind while using provisional report. Keeping in the ground reality that it would sometimes be required to have much more time to finalize the reports by following all the standard procedures, such as reviewing, clearance from the technical committee, final clearance by the authority to print.

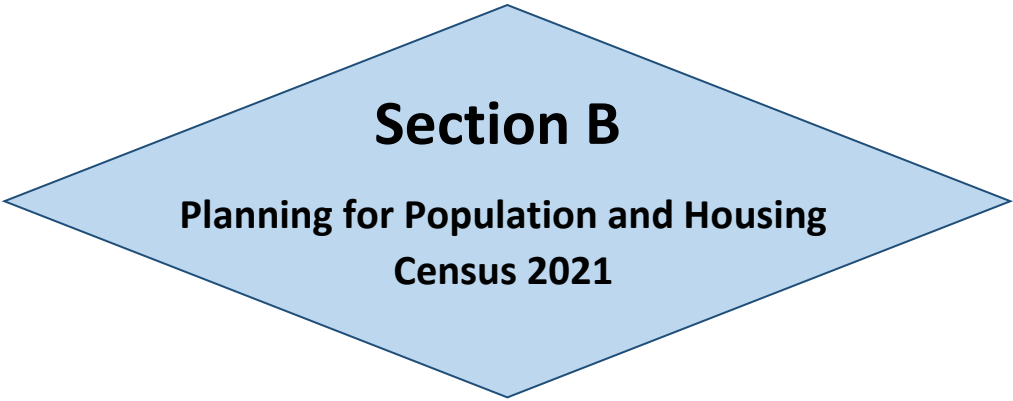
- **Appointment of Multiple personnel at Project responsibility position**

Population Census is one of the biggest and longest activities of BBS. The personnel involved in the project responsibility is needed to be supported by sufficient and skilled project management team with proper back-ups. For example, to assist the project director, two Deputy Project Directors (DPD) might be appointed so that no unforeseen absence of the PD

(leave/transfer/retirement/promotion) can interrupt the continuation of the Project works. One senior local consultant may be appointed at the planning stage to support the core team.

- **Un-interrupted flow of Fund release**

As per the experience of the 2011 census, even when the fund is available, the release of the fund could be delayed which hampers the time bound work activities of the project and its consequential activities too. As censuses is a time bound work its every phase of activity is to be completed within the stipulated time. Therefore, presence of smooth flow of allocated fund will have to be made.



Section B
Planning for Population and Housing
Census 2021

FEATURES OF MULTI-MODAL CENSUS

This chapter of the report describes the results of a multi-modal approach for census, questionnaire completion rates, and associated effects with the approach. Considerable research has been conducted on methods for improving response rates to surveys. Several key factors are known to affect response rates, including salience of the survey (Herberlein and Baumgartner, 1978), form of mailing and monetary incentives (Dillman, 1991), and multiple contacts (Linsky, 1975, Dillman, 1991).

5.1 Response-maximizing approach

Following are few approaches for maximizing the response rate in multi-modal censuses:

- A respondent-friendly questionnaire;
- Up to five contacts with recipients of the census (a brief pre-notice letter sent a few days prior to the arrival of the questionnaire; a questionnaire mailing that includes a detailed cover letter; a thank you/reminder postcard; a replacement questionnaire; a final contact, possibly by telephone.);
- Personalized correspondence;
- Electronic data collection and

Publicity: Population census T. Shirts can be given to committee members, enumerators and supervisors.

When designing cost-efficient data collection efforts, researchers must usually balance available resources against expected returns. For example, telephone follow-up can be extremely costly and might yield fewer completes than would an additional mailing of a questionnaire.

A common methodology in census research is repeated visit of the enumerator, mailings with telephone follow-up, but there is a dearth of information about expected results for each step of the process. Such information could guide researchers in tailoring their census strategies to maximize efficient use of resources for a given field period.

5.2 Tools for Computerized Processing

Historically, the census information was gathered via questionnaire forms. In order to reduce paper usage, reduce payroll expense, acquire the most comprehensive framework for censuses are to be compiled in handheld device to be used for the first time canvassing the address with some basic information of the 2021 Decennial Census Project. Database with these addresses and the basic information are census framework.

Enumerators (information gatherers) that had operational problems with the device understandably may made negative reports. In rural areas there may be a problem with transmission of data to and from the Central Database. Since the units were updated nightly with important changes and reprogramming, operator implementation of proper procedure was imperative.

5.2.1 CAPI and CATI

The most common methods of data collection for surveys and censuses globally are postal mail, personal interviewing, and telephone interviewing. The growing number of respondents with access to the Internet introduces a new data collection alternative that is likely to become increasingly important in the future. Like computer assisted telephone interviewing (CATI) and personal interviewing (CAPI), computer assisted self-interviewing using the website permits an interactive exchange with the respondent through intelligence built into the computer application. While promising, Internet surveys also face a variety of challenges in survey coverage, in survey design, in security of confidential information, and in the midst of new and rapidly changing technologies. However, extent of CAPI in 2021 census of Bangladesh is yet to decide and will be finalised after approval of the project.

5.2.2. Security

Since the Internet is a public network, security vulnerabilities exist. They include the following: (a) theft, data stolen during the course of transmission or from a computer or network; and (b) impersonation, a sender or receiver using a false identity for communication. The Census Wing needed to address these issues to provide respondents with a secure and private method to use the Internet for census data collection.

For the majority of Census data confidentiality is protected by Statistics Acts, 2013. The public's perception of the confidentiality of this data also influences the response rate for Census and the ability

to collect accurate information from households and institution. Since the security vulnerabilities of the Internet have been widely publicized, a devoted considerable time and efforts are to be development for a security solution for Internet data collection that meets the standards. Aside from security standards the Census requires for internal applications, it also must comply with the Data Encryption Standard and the Security Requirements.

6.1 A Paradigm Shift in Collecting and Analyzing Data

Censuses organization of countries in case of BBS Census Wing may find itself in the midst of a paradigm shift in the way data are gathered, manipulated, and disseminated. The agency's science and technology innovation (STI) indicators program faces several challenges:

- Traditional census face increasing expense, declining response rates, and lengthy time lags between when data are gathered and when derived indicators and other statistics can be published.
- Tools for data extraction, manipulation, and analysis are rapidly evolving.
- Repositories of STI measures that users demand are distributed among several statistical agencies, and private repositories.
- Sources of knowledge generation and innovation are expanding beyond the traditional developed countries to emerging and developing countries.
- Users' expectations are rising, and they are demanding more access to statistics that are closer to the actual measures of what they want to know.

Government statistical agencies, confront a world of dizzying change in how information technology is integrated into their data gathering and data management activities. The World Wide Web (the web), in particular, has been transformational in making possible new kinds of forecasting and data collection methods that provide useful insights in almost real time. These tools provide information much more rapidly than the traditional censuses with up to multiple-year lags. In addition, other changes are occurring.

DE-FACTO and DE-JURE Method

Previously all Censuses of Bangladesh were held in de-facto method to provide population estimate at a point of time. In 2011, a modified de-facto method was adopted where household members who were on board and on duty were counted in their respective households in order to minimize error of collecting floating population.

In 2021, it is suggested by many data users to adopt De-jure method of data collection to capture the population of households who are living abroad for job or study. But, those who have migrated permanently may be excluded. This will finally be decided by the expert committee for the census and in consultation with the experts and stakeholders.

6.2 Multimodal Data Development

One issue that needs to be explored is the feasibility of blending the use of administrative records, scientometric tools, and survey techniques to produce more accurate data. A multimodal approach would help to create longitudinal series using existing and new information. In the near term, the topic could be explored through a consultation specifically designed to discuss the conceptual framework and feasibility of blending data acquisition techniques and using this mixed-methods approach to develop new indicators.

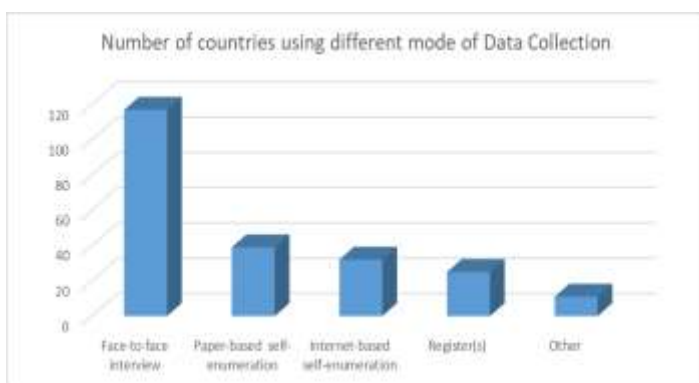


Figure 1: Mode of enumeration by different methods

This approach could be useful for developing real-time maps of networked scholars, while measuring return on investments from federal research funds as they are used and linking them to outputs (paper and patents). At the same time, this approach would periodically assemble basic data on education, employment, work activities, and demographic characteristics.

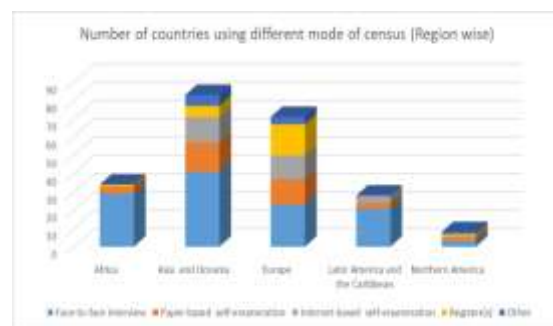


Figure 2: Mode of enumeration by geographic region

Table 2: Mode of enumeration by geographic region

Geographic region	Percentage of countries using				
	Face-to-face interview	Paper-based self-enumeration	Internet-based self-enumeration	Register(s)	Other
All geographic regions	85	28	23	18	8
Africa	100	14	0	3	0
Asia	95	33	31	13	15
Europe	59	36	33	44	10
Latin America and the Caribbean	95	14	18	0	0
Caribbean	100	25	38	0	0
Latin America	93	7	7	0	0
Northern America	75	50	25	25	25
Oceania	80	60	40	20	0

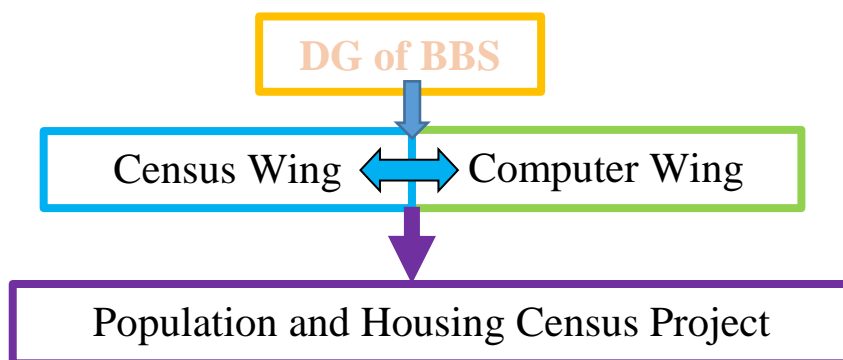
Information in table shows, however, that there was combined use of modes of enumeration for many countries. For example, while 117 (85%) of the 138 countries or areas that responded to the survey used or plan to use face-to-face interviews, 73 (62%) of these used or plan to use this mode of enumeration by itself while 44 (38%) used or plan to use it in combination with some other method(s). Similarly, of the 39 countries or areas that used or plan to use paper-based self-enumeration, only 4 (10%) used or will use this method by itself. The remainder will use it in combination with one or more other methods.

None of the 32 countries or areas with Internet based self-enumeration have used or plan to use it as an only method of enumeration. Only 10 (40%) out of the 25 countries or areas that are using registers for their 2010 round censuses, are relying only on this source of information. In the remaining 15 (60%) it is used in combination with other methods. It is interesting to note that 9 (53%) out of the 17 countries or areas in Europe that are using registers use them as an only source while the other 8 (47%) use them in combination with other sources.

6.3 Recommendations for Census Organizational Structure

In Bangladesh context, data of census and survey are generally collected through personal interview and filling up the questionnaire for manual, OMR, OCR and ICR data entry. In some cases Tab and Laptop based questionnaire were used for direct data input.

Currently there is a census wing (Population, Agriculture and Economic Census) headed by Director under Director General of Bangladesh Bureau of Statistics. For convenience of census data use for subsequent surveys the Agriculture Census may be place under Agriculture Wing and the Economic Census may be placed under Industry and Labour Wing. For smooth operation of census, as done before, a close collaboration between census wing and computer wing will be needed for proper geo-coding and data processing of the census, 2021.



6.4 Framework of Multimodal Census and Surveys

Multimodal Census can be defined as census having facilities of data collection through different modes simultaneously. There will be several database based on modes to analyze response rates and errors by modes. Finally, a consolidated census database will be generated from all of these modes of database. Census Frame is prerequisite for multimodal census.

Below are the major tasks of Census Framework Unit:

- (1) Data collection for Census Framework;
- (2) Develop on line standard database for Census Framework;
- (3) IT support for Hardware and network;
- (4) Need base mobile/web application development;
- (5) Upgradation and modification of framework data; and
- (6) Upload the changed data.

Further, the Census Framework for National Electronic/Multimodal Census are as given below:

- (1) Planning for Electronic/Multimodal Population and Housing Census of 2021;
- (2) Development of e-Census Framework Database for Population and Housing Census of 2021;
- (3) Keeping provision for future Socio-demographics Surveys;
- (4) Develop methodology for Electronic/Multimodal survey;
- (5) Give full support to all census and surveys with framework database.

6.4.1 Phases of the Census Framework (Zonal Operation):

There will be two phases of Census framework. Through these phases complete census information will be collected and framework database will be developed before census year. If needed development of Census Framework may be out sourced to an experienced firm through competitive bidding as per PPR. Before undertaking the Framework Phases, a comprehensive big piloting on framework has to be undertaken if time permits. Based on this piloting, a realistic Framework phases are to be planned.

Below are the phases of Framework:

1. Phase-I: 32 Districts
 - a. Six districts having City Corporations.
2. Phase-II: 32 Districts
 - a. Six district having City Corporation

The purpose of census framework is upgradation and modification of Electronic Census Framework to give full support to Multimodal Population and Housing e-Census 2021.

Census Framework Database will have selected information that will be useful for census. After the completion of Multimodal Population and Housing e-Census 2021, there should be an arrangement so that Census Wing may continue for regular upgradation of census framework database by every year or two years following the e-census 2021 and to prepare a National Population Register (NPR) which is the mandate of BBS as per Statistics Act, 2013.

Below are the steps of the e-Census:

- 1) Piloting for Census Framework.
 - a. Plan for piloting of Census Framework
 - b. Based on the analysis of this Piloting, Census Framework Phases are to be planed.

- 2) Framework Phase-I:
 - a. Planning for Census Framework Phase-I based on analysis of Piloting for Census Framework, its Database and Census Questionnaire
 - b. Conducting Census Framework Phase-I and developing for Census framework, its Database
- 3) Framework Phase-II:
 - a. Planning for Census framework Phase-II, its Database
 - b. Operationalize the Census framework phase-II, its Database

6.4.2 Possible Modes of Multimodal Data Collection System:

Below are the possible modes of data collection in the Multi-Modal data collection system:

Data Collection Mode	Data Collection by
ICR Questionnaire Enumerator fill up the ICR questionnaire by door to door interview and at the end of his work schedule	Enumerators
Web and Mobile Application <ul style="list-style-type: none"> • Using online web and mobile application • Providing Household card during zonal operation with unique ID for avoiding duplication 	<ul style="list-style-type: none"> • Enumerator • Family Members/respondent Directly fill up the census information against Household Unique ID
Enumeration status <ul style="list-style-type: none"> • Checking enumeration status through SMS, mobile app, call center etc. • Use of mobile app for top sheet (tally sheet) data for verification 	<ul style="list-style-type: none"> • Sending SMS to fixed number to get feedback and get daily enumeration update through mobile app by the enumerator • Linking the database with the call center while operation

6.4.3 Application Software:

A number of application software would be required for collecting data through multi-modal data collection system. Below are the planned software for the data collection system:

- ▶ Application for Census Framework
 - Application for Data Collection on Census Framework
 - Application for tally sheet data entry from field
 - Database Development for Census Framework
- ▶ Application for Multimodal e-Census Data Collection
 - Internet Data Entry
 - Smart Mobile Data Entry
 - Database Development for Multimodal Census
- ▶ Application for Data Processing
- ▶ Application for Tabulation

6.4.4 Framework Database for 2021 Population and Housing Census

During development of Census Framework Database (CFD) data collection will be using only smart phone/tablet of their own. Enumerators will collect data using the user-friendly data entry application software. At the end of the day he will send the data to the Framework database using network base data transferring system.

Assumptions	Number
Approximate Household	4,00,00,000
Approximate HH are to be listed per Day	20
Working Days (In two phases)	20

Following information are draft Framework data that are to be collected:

Identification:

Rural/Other Urban Area:

Zila	47	KHULNA
City Corporation	99	NO
Upazila/Thana	17	DACOPE
Paurashava	99	NO
Union/Ward	10	BAJUA
Mouza	039	BAJUA
Village/Mohalla	07	BAJUA KACHA
RMO	1, 3, 7 (5)	Paurashava, Upz HQ, GC (Cantonment)

Paurashabha/Citi Corporation Area:

Division	40	KHULNA
Zila	47	KHULNA
City Corporation	99	Non City Area
Upazila/Thana	21	DAULATPUR
Paurashava	22	Chalna Pauroshava
Union/Ward	01	WARD NO. 01
Mouza	372	MAHESHWARPASHA (PART)
Village/Mohalla	021	BANIKPARA
RMO	2	Parurashabha

Recommended Manpower Requirement for Multimodal Census

Sl. No	Position	Number	Remarks
Census Framework/Multimodal Census			
	Overall Supervision and Guidance	1	Secretary, SID
	Census Commissioner/ National Coordinator	1	DG, BBS
	Census Deputy National Coordinators	4	DDG, BBS & Additional Secretary/Wing Head, SID (3)
	Executive Coordinator	1	Project Director
	Divisional Coordinator	8	Director/JDs
	Regional Census Coordinator	30	Senior Level Deputy Directors
	District Coordinator	100	To split big Districts DD/SO
	City Corporation Coordinator	15	For big cities 2 and other cities 1
	Upazila Census Coordinator	500	
	Zonal Officer	3000	Staff members/ex-staff members of BBS
	Supervisor	80,000	
	Enumerator	4,00,000	
ICT			
	Network Administrator	2	
	Hardware Engineer	10	Each division will have one Hardware Engineer
	Programmer	2	
Census/Multimodal Consultant			
	ICR Consultant	1	Having Experiences on Census & ICR
	CAPI and Data Processing Consultant	1	Having Experiences on Census Data Processing
	Census Operation Consultant	1	Having Experiences on Population Census Operation
	Report Writing Consultant	1	Having Experiences on Population Census Report writing
	GIS Consultant	1	Having Experience and Education in GIS/RS

6.4.5 e-Census 2021 Procedure

Large scale piloting on multimodal data collection system before starting or during the framework database development is needed. This is very important for multimodal e-census. Because this piloting will identify the response rate and at the same time error rate by data collection mode. Based on these rates realistic adjustment of planning for e-census are to be done for success of multimodal e-census

2021. Beside these, it will identify the further training needs for enumerators and supervisors by modes and in turn it will increase the human capability of persons to be engaged in multimodal e-census 2021.

Questionnaire of Census Framework to develop census frame work database will cover some basic characteristics of household. All the information will be collected through the well trained and good enumerators using smart phones/tabs having facilities of identifying Global Positioning System (GPS) Coordinates. This GPS systems will verify from where the enumerators are collecting the information. This GPS will also identify location of households. Besides, the device must have the facilities to take the picture of the household whose information is being collected.

Application software are to be developed and tested during piloting period and necessary up-gradations are to be done during the framework development phases so that these applications can be used in final 2021 census without any troubles or errors.

Necessary steps are to be needed to connect with Birth Registration System and National ID Card System so that online verification of information with these two organizations can be done. This will ensure the verification and accuracy of information.

Enumerators may be appointed after providing intensive proper training with evaluation systems. Successful enumerators whose performances will excellent during pre-census field data collection (zonal operation), may be appointed as supervisor in the next phases. Therefore, there is no alternative of hands on training to the enumerators to get the better performances from the enumerators.

Since the information in the e-Census will cover more questions than framework, therefore information of census framework database (CFD), can be used as a benchmark during census data collection and some questions need not be repeated.

Following data collection modes are suggested for e-census data collection system.

6.4.6 Household assisted data collection

- a. Responsible Household members may send their census data through web/mobile application using unique Household ID Number provided earlier.

Internet based application software procedure

In this procedure, household members will download the user-friendly data entry application to their devices or connect through browser. During their convenient time they will put their information to the central database. After submission of the information they will be notified with SMS/email message.

6.4.7 Face to face interview by Data Collector:

Appointed and well-trained enumerators will collect census data through door to door visiting and using ICR questionnaire. In the non-accessible households drop and pick up procedure will be applied but should be done within the census period. The enumerators may also collect the respondent's cell phone/land phone number which can be used for data collection using CATI system.

The comparative analysis of above three data collection procedures are:

SL. No.	Procedures	Advantages	Disadvantages	Remarks % of household estimated to be covered
1.	Household members may send their census data through mobile/web application after the completion of main enumeration if they are left out.	Easily they will be sent their information	Online help may not be sufficient to understand the problems and to send the data.	Clear Instructions should be provided into information
	i. Application software for access to web-based and Mobile Phone	Computer literate person can easily use the application software	General user may encounter problems and need online assistance	
	ii. Internet based application software procedure	Internet literate person can easily use the application software	General user may encounter problems and need online assistance	
2	Drop and Pick	Dropping hard copy self-administered questionnaire, filled up by the household members	Mis-leading information might be provided.	Verify with the other registered database.
3.	Enumerator Assisted Data Collection:			
	i. Own/provided Smartphone/Tablet	Enumerators having Smart Mobile/tablet device can collect and send data using the mobile application.	Mobile network might interrupt.	<ul style="list-style-type: none"> • Ensure uninterrupted network connection. • Data should not be saved on the device after submission to the central server.
3	ICR Questionnaires	Suitable for large-scale numeric questionnaire	Error rate for alphabet is very high	<ul style="list-style-type: none"> • Minimizing text base open field. • Rigorous training on ICR pattern handwriting.

7.1 Planning: Master plan and sub-plan

A detail master plan is needed for implementing and conducting the Multi-modal/Electronic Population and Housing Census 2021 efficiently. The master plan for Multimodal Population and Housing Census 2021 can be divided into two sub-plan– one for preparation for multimodal census activity and one for real multimodal census 2021.

Sub-plan 1: To develop Framework Database of Multimodal e-Census 2021, which can be termed as ‘pre-census phases’. This plan would have following four phases:

Phase-I: Part Framework having Listing: 2018-19

Phase-II: Part Framework having Listing: 2019-20

Sub-plan 2: Multimodal Census 2021, which can be termed as ‘census phase’. This plan would have following eight phases:

Phase I : Main Count in March, 2021.

Phase II : Post Enumeration Check (PEC) in April, 2021.

Phase III : Sample Survey in September, 2021.

Phase IV : Preliminary Report Publishing June, 2021

Phase V : National and District Community Reports Publishing in 2022-24.

Phase VI : Publication of Monographs 2022-24.

Phase VII : Preparation of database for NPR.

Phase VIII : Mid-Decade Socio-economic Demographic Survey 2025.

To conduct the Multi-modal Population Census in the country a project entitled “The Population and Housing Census 2021” having above two broad sub-plans would be needed. The broad objective of the project would be to carry out the country's sixth population census 2021 through these two sub-plans. At the outset, a calendar of census activities needs to be prepared and also time schedules need to be set for all the activities of the project.

As per the calendar, questionnaire designing, pre-testing, publicity, training of officials (enumerators, supervisors, zonal officers, Divisional/Regional/District coordinators, other field level officers and officers of the headquarters), field enumeration, data preparation, data capture, data processing, report writing and data dissemination for both sub-plan are to be done. Bangladesh Bureau of Statistics (BBS) need to initiate a project proposal and get it approved at the earliest to take necessary steps for conducting the sixth Population and Housing Census, 2021 based on Framework Development and e-Census in time.

7.2 Upgradation for 2021 and replication of 2011

To conduct Population Census 2021, specific designated human resources to be deployed in all geographic area. Below are the coordination structures and organizational settings that to be used during 2021 census.

7.2.1 District and Zonal level

The lowest unit of census is Enumeration Area (EA). During population census 2021, a total of 4,00,000 (approximately) EAs will be delineated all over the country. Above them there were 80,000 Supervisors' Areas (SAs) throughout the country and each SA comprises of 4-5 EAs. For each EA, one enumerator and for each SA one supervisor to be appointed temporarily from local educated youths. Females will be given priority in selecting enumerators and supervisors. Enumerators and supervisors were supervised by 5,000 (approximately) Zonal Officers. To supervise the activities of zonal officers, 8 Divisional co-ordinator, 30 Regional co-ordinator, 112 Census Zila co-ordinators (including city corporation) will be engaged from Class-I officers of BBS & SID. For close supervision, each administrative unit (split for census) will be supervised by the respective co-ordinators.

Each zone will be consisted of, on an average 100 enumeration areas. The large Mauzas/villages should be divided into multiple enumeration areas and Mauzas/villages with less than 25 households will be merged to form an enumerator's area consisting of maximum 120 households, keeping in view the terrain and habitation pattern of the neighbourhood. Special area like remote char land, CHT, Haor, reserve forests, coastal areas, etc. should treated based on communication, distance of location of households and topographical situations. In those case average households may be less than national average with rationale distribution.

7.2.2 Central control room, Call Center and top-level liaison

The Project Director of the Population and Housing Census Project will be the coordinator of field activities and maintained liaison with all field level coordinators and higher authority of different relevant organizations. The Director General of Bangladesh Bureau of Statistics will as the Census Commissioner as well as the National Census Coordinator. The Secretary of Statistics and Informatics Division will the Chief Census Coordinator will guide the whole activities of population census, 2021. The additional secretaries and Deputy Director General (DDG) will be Deputy Census Coordinator for census operation.

The local administration and public representatives participated in the census activity through census committees already formed for City Corporations, Paurashavas, Zilas, Upazilas, Wards, and Union Parishads by the Cabinet Division.

Central census control room will be setup at Dhaka headquarter of BBS (Parishankhyan Bhaban) under active supervision of the Project Director. Similarly, control rooms will be setup in each administrative level namely Division, Region, Zila, Upazila and Union/Ward. These control rooms will function round the clock during entire field enumeration period. A number of officials will be engaged to provide logistics during census field activities, to monitor constantly the census performance, to inform the National Census Coordinator/Deputy Census co-ordinators and Chief National Census Coordinator about performance status and to obtain their instructions for successful completion of the census.

For the population census 2021, the number of EA's to be determined during frame work development along with updated information regarding all the above organizations.

An full-pledged call centre should be outsourced for giving instant service to the public for covering them in the census enumeration. The call centre should have the technical capacity to link with any census personnel with the enquirer if required.

7.2.3 Formation of Expert Committee

The undertaking of population census is a time bound work. Each and every component of its work needs to be done within stipulated time frame as per the census calendar. A high-power Expert Committee would be needed for policy decision, inter-ministerial coordination and support, assessment of data needs and administrative and financial support where necessary at the time of the

implementation of the census. The census and survey Committee at different administrative levels approved by the cabinet will function in the census process.

7.3 Census Calendar

Conducting of census is an enormous and time bound task. It has to be carried out throughout the country. In order to carry out the census operation efficiently in time, a calendar of activities for the Population and Housing Census 2011 was chalked out and followed accordingly. The Calendar of 2021 census activities can be as follows:

Calendar of Activities for the Population and Housing e-Census 2021 (Tentative)

Sl. No.	Activities	Start	End	Subject to Approval of DPP
1. Planning and Preparation				
	1.1 Preparation of DPP	October 2017	May 2018	--
	1.2 Development and finalization of census framework activities	July 2018	September 2018	Subject to approval of DPP
	1.3 Approval of framework and census activities by the Steering Committee of Census Wing	October 2018	December 2018	Do
	1.4 Dialogue with user's	January 2019	April 2019	Do
	1.5 Formation for Steering Committee	January 2019	January 2019	Do
	1.6 Approval of DPP	May 2018	June 2018	Do
	1.7 Recruitment of HQ Staff	July 2018	August 2018	Do
	1.8 Foreign/Local fund raising	April 2018	December 2018	Do
	1.9 Preparation of detail calendar of framework and census activities	May 2018	September 2018	Do
A.	B. Framework Development for 2021 Multimodal/Electronic Census			
2. Mapping and Geo-Coding				
	2.1 Expert view regarding census map	July, 2018	September, 2018	Do
	2.2 Procurement of base map	September, 2018	December, 2018	Do
	2.3 Formation of GIS working group	January, 2019	January, 2019	Do
	2.4 Training on GIS based Map	August 2019	September 2018	Do
	2.5 Pilot test and seminar on the questionnaire			Do
	2.6 Development of digitized maps and updated Geo-Code	July 2018	October 2018	Do

Sl. No.	Activities	Start	End	Subject to Approval of DPP
	2.7 Procurement of map logistics June, 2008	August 2018	August 2018	Do
	2.8 Correction of map and Geo-Code March, 2009 December, 2010	October 2018	December 2018	Do
	2.9 Reproduction of maps December, 2010	January 2019	January 2019	Do
Framework Development for 2021 Multimodal/Electronic Census				
3. Census Framework (Pre-Census 1st Year)		August 2019	December 2019	Subject to approval of DPP
3.1	Finalize the test piloting areas	August 2019	August 2019	Do
3.2	Develop the framework listing and census questionnaire for the test pilot	August 2019	August 2019	Do
3.3	Develop the applications	August 2019	August 2019	Do
3.4	Procurement and installation of hardware and its accessories	August 2019	August 2019	Do
3.5	Finalize the GIS Maps	August 2019	October 2019	Do
3.6	Recruitment of manpower	March 2019	December 2019	Do
3.7	Field operation of data collection of census framework	December 2019	December 2019	Do
3.8	Data analysis and report writing on findings and problems			Do
4. Piloting for Census Framework (Pre-Census 2nd Year)		January 2019	June 2019	Subject to approval of DPP
4.1	Finalize the piloting areas			Do
4.2	Develop the framework listing and census questionnaire for the pilot			Do
4.3	Develop the applications			Do
4.4	Procurement and installation of hardware and its accessories			Do
4.5	Finalize the GIS Maps			Do
4.6	Recruitment of manpower			Do
4.7	Field operation of data collection of census framework			Do
4.8	Data analysis and report writing on findings and problems			Do
5. Census Framework Development (Pre-Census 3rd Year)		July 2019	March 2020	Do

Sl. No.	Activities	Start	End	Subject to Approval of DPP
5.1	Finalize the areas for the framework			Do
5.2	Develop the framework listing and census questionnaire			Do
5.3	Develop the applications			Do
5.4	Procurement and installation of hardware and its accessories			Do
5.5	Finalize the GIS Maps			Do
5.6	Recruitment of manpower			Do
5.7	Field operation of data collection of census framework			Do
5.8	Data analysis and report writing on findings and problems			Do
5.9	Make up-to-date framework for 2021 census	July 2020	March 2021	Do
6. Questionnaire				
	6.1 Finalization of Questionnaire	July, 2020	July, 2020	Do
	6.2 Printing of Questionnaire	September, 2020	December, 2020	Do
7. Procurement of Machineries and logistics				
	7.1 Procurement of machineries	September, 2019	December, 2020	Do
	7.2 Procurement of chalk, eraser, sharpener, pencil and envelope	September, 2019	December, 2020	Do
	7.3 Procurement of expendable items	December, 2019	December, 2020	Do
	7.4 Procurement of vehicles	September, 2019	December, 2020	Do
8. Publicity				
	8.1 Poster, Sticker, Brochure, Calendar etc.	September, 2020	March, 2021	Do
	8.2 Film jingle making	September, 2020	December, 2020	Do
	8.3 Projector TV in public places and satellite TV channel	March, 2021	March, 2021	Do
	8.4 Supplement in the daily newspaper	March, 2021	March, 2021	Do
	8.5 Census publicity through micing and drum beating	March, 2021	March, 2021	Do
9. Zonal operation (Frame work census)				
	9.1 Zonal operation-I	June, 2020		Do
	9.2 Zonal operation-II	December, 2020		Do
	9.3 Correction of computer list	December, 2020		Do
10. Pilot Census				
	10.1 Field enumeration	December, 2020		Do
	10.2 Processing	December, 2020		Do

Sl. No.	Activities	Start	End	Subject to Approval of DPP
	10.3 Publication of pilot census report	December, 2020		Subject to approval of DPP
11. Enumeration				
	11.1 Training of master trainers at Parishankhan Bhaban (HQ) and distribution of census materials	February 2021		Subject to approval of DPP
	11.2 Transportation of census materials from Dhaka to Zila headquarters	February 2021		Do
	11.3 Training of zonal officers in the Zila headquarters and distribution of census materials	February 2021		Do
	11.4 Holding of meeting of the census committee, publicity and finalization of training centers	February 2021		Do
	11.5 Training of enumerators and supervisors by batch Batch-1 20 February, 2021 22 February, 2021 Batch-2 23 February, 2021 25 February, 2021 Batch-3 26 February, 2021 28 February, 2021	March 2021		Do
	11.6 Counting of floating population	XX March Night 2021	XX March Morning 2021	Do
	11.7 Micng (loud speaker) from the mosques and other religious institutes			Do
	11.8 Enumeration door to door (5 Days)	XX March, 2021	XX March, 2021	Do
	11.9 Filling out of tally sheet by enumerators and submission to the supervisors	31 March 2021	31 March 2021	Do
	11.10 Collection of census book (Questionnaire) by the supervisors and filling out of form-6	April 2021	April 2021	Do
	11.11 Scrutiny of census books by the zonal offices and filling out from-7	April 2021	April 2021	Do
	11.12 Collecting of filled-in and blank census books by the zonal officers and disbursement of honorarium cheque to the enumerators, supervisors, union/ward secretary	April 2021	April 2021	Do
	11.13 Submissions of census book to the Zila headquarters by the zonal officers	May 2021	May 2021	Do
	11.14 Submission of census book to the central control room at Dhaka by the Zila census coordinator	May 2021	May 2021	Do
12. Receipt of filled-in forms and Inventory of documents				

Sl. No.	Activities	Start	End	Subject to Approval of DPP
13.	Holding of PEC	April, 2021	April, 2021	Subject to approval of DPP
14.	Publication of Census Preliminary Report	June, 2021	June, 2021	Do
15.	Processing of Documents			
	12.1 Editing and coding	June, 2021	March, 2022	Subject to approval of DPP
	12.2 Data entry (Data Capture)	September, 2021	June, 2022	Do
	12.3 Computer editing and correction	September, 2011	December, 2022	Do
	12.4 Tabulation and analysis	September, 2021	March, 2013	Do
16.	Conducting of Sample Survey	October, 2021	October, 2021	
17.	Publication of Reports			
	14.1 National report/ National series	April, 2022	December, 2022	Subject to approval of DPP
	14.2 Zila report /Zila series	April, 2022	June, 2023	Do
	14.3 Community report/Communityseries	April, 2022	June, 2023	Do
18.	Population Monographs	July, 2023	December, 2023	Do
19.	Population Projection of Bangladesh	July, 2023	December, 2023	Do
20.	Data Base Development for NPR	July, 2023	December, 2023	Do
21.	Inter-Census Survey	July, 2023	December, 2023	Do

7.4 Cartographic Preparation

In modern censuses and surveys, maps are usually used to reduce duplication and omission of areas to be covered. It is also necessary to ensure optimum utilization of resources to provide logistic support in the field. Map-based control system is essential for conducting the census of 2021 and a unique geo code up to holdings/families will also be needed. To make the 2021 census a success, extensive cartographic preparations are needed.

7.4.1 Satellite Image

Step should be taken to obtain high resolution satellite image for updating maps. This work can be outsourced to the experts in this field. An GIS Consultant should be recruited at the very beginning of the project. GIS based dissemination platform should be also developed for data dissemination after release of the final reports.

7.4.2 Preparation of maps

The Enumeration Area (EA) maps and Supervisors Area (SA) maps will be used in the census. It is very important to take the initiative to start updating the Mauza maps with village and EA boundaries four years before the census year. In order to carry out this huge task several groups of staffs of BBS are to send to the field to update the Mauza maps through visiting the Mauza physically. Before going to the field, they should carry old Mauza maps used during the census 2021 and latest computer geo code list up to the Mauza and village level. In case of non-availability of any Mauza map, sketched maps are to be prepared by the draftsmen and cartographers of the BBS. These maps can be reproduced using the printers and photocopier. In this way, Mauza, union, Upazilas and Zila maps are to be updated through incorporating the changes in the area, creation of new Upazilas or union or transfers of area in the maps.

7.4.3 Use of Administrative Unit Maps

In order to conduct the Population and Housing Census 2021 efficiently, the unit of enumeration are to be considered as the Enumeration Area (EA). The EA will be constituted with around one hundred households. The delineation of EA will be done within a village and it will also be shown in the Mauza map. In Bangladesh, the Mauza is considered as the revenue village. It has a jurisdiction list (JL) number, and a detailed map is available for mouza. For the population census, the village is the lowest level of geographic area which is divided into one or more EA on the basis of number of household. Old Mauza maps will be updated by delineating every village and EA boundaries. Correct delineation of EAs is possible by using these updated Mauza and village maps. Mauza, union, Upazila and Zila maps will be used to control the field operation in the census.

7.4.4 Enumeration Area (EA) Maps

Conducting the population census and complete the counting is possible only when the enumeration area is well defined and delimited clearly in maps, For this purpose, Enumeration Area maps are to be prepared within the villages. Big villages where more than one hundred households reside will be divided, and small villages where very few households reside will be merged together to form an Enumeration Area. As a result, the duplication and omission of EAs will be minimized in the census.

7.4.5 Supervisor's Area Maps

As mentioned earlier, Supervisor's Area (SA) maps will also be needed in conducting the Census of 2021. There have been at least five EAs under each supervisor's area map which will be identified in the

Mauza maps. Intensive and close supervision and control should be ensured by the supervisors, so that no household can be left without enumeration and / or enumerated twice.

7.4.6 Geo-code

A GIS map based upgraded geo-code along with GPS Code will be the main instrument in developing an efficient control system for reduction of coverage error, improvement of accuracy and timeliness for 2021 census. It has both direct and indirect impact on census results. Directly, it makes processing control easy and saves time and labour. Indirectly, it accounts for all geographic areas systematically and accurately and also can be located using GPS Code.

7.4.7 Geographic Information System (GIS)

123. GIS with GPS technology is very important to conduct the census of 2021 and to increase the utility of information to the data users. The population and other indicators can be published based on this unique geo-code.

7.5 Pre-Census Activity

7.5.1 Pre-Test

To finalize the census questionnaire, three pre-tests during framework development will be conducted. The Standing Technical Committee of census will evaluate the reports of the first two pre-tests and will suggest necessary adjustments in the questionnaire and framework of the census operation. Accordingly, the third pre-test will be carried out in final operation of framework development in 2020.

In this pre-test enumeration will be done in five days like the main census. The size of the enumeration area was around 100 households. Enumeration area (EA) maps, manuals etc. Will strictly followed in the third pre-test. Senior officers of BBS will be engaged as coordinators and Upazilas statistical officers of BBS to be assigned as supervisors. Enumerators to be selected from amongst the local unemployed educated youths.

7.5.2 Zonal Operations (Frame Work Census) two phases

In order to organize field operation for the main census, two zonal operations (Framework census) are to perform. The first zonal operation will be held in June, 2020 covering all the rural areas and the second zonal operation are to be carried out in December 2020 covering the urban areas of the country. All census coordinators and zonal officers will be sent to the field for zonal operations. The tasks performed in zonal operations were:

- 1) Final verification and demarcation of enumeration areas:

- 2) Formation of census committees at Zila, Upazilas, municipality and union/ward levels and establishment of control rooms;
- 3) Finalization of the list of enumerators and supervisors and training centers
- 4) Finalization of the list of branches of Banks for disbursement of honoraria
- 5) Preparation of the list of restricted areas etc. and
- 6) Preparation of the list of VIPs.

7.5.3 Preparation of Verbatim Manual

In order to provide uniform training at all levels a verbatim manual of instruction are to be prepared and used in training classes. Concepts and definitions of all the variables are to be clearly explained in the manual, so that local enumerators could easily understand everything relating to the census. Another field manual for the purpose of field control are also to be prepared and distributed to the zonal officers. A detailed description of field organization and field activities, formation of census committee at zila, Upazila, city corporation, municipality, union, ward levels, along with their responsibilities are to be explained in this manual. Setting-up of control room at the headquarters, Zila, Upazila and Union/Ward levels are also to be described in the manual. Responsibilities of census activities include census materials packing, distribution, transportation, submission to the control room, disbursements of honoraria cheques etc. are also to be described in the field manual. The constitution of census committees at different levels are also to be described in the manual.

7.5.4 Printing of Questionnaires, Forms and Schedules in Case of Manual Data Collection

The questionnaire, forms and time schedules are the most important instrument documents of a census through which the desired information is to be obtained. For the 2021 census, questionnaire will be prompted through international bidding. After printing of the questionnaires three types of books, i.e. one of 120 pages, one of 60 pages & one of 30 pages will prepared and used in census operation. Similar types of books are to be prepared for census operation.

7.5.5 Recruitment of Enumerators, Supervisors and their Function

To conduct population census 2021, local educated unemployed youths and college/university students (both male and female) having computer aptitude should be recruited as enumerators and supervisors. One enumerator will be responsible of enumerating one EA. Sufficient reserve enumerators are to kept in the field to meet unavoidable situations like sickness and also to sporadic enumeration of transient

persons and floating population. The appointment of enumerators are to be made by the zonal officers on field visits. Each enumerator will be selected from within/adjacent to the assigned EA for enumeration. The enumerators will be appointed by issuing appointment cards supplied by the census headquarter. These cards will also be used as identity cards during the enumeration. Each enumerator are also to be shown his EA physically by the zonal officers. The appointments of enumerators will be made in consultation with the local union council Chairman/Member/Ward Commissioner and public representatives.

The functions will be performed by enumerators as follows:

Pre-census functions

- 1) Introduced to his supervisor;
- 2) Acquainted with EA and its boundaries from the zonal officer and supervisor;
- 3) Attended enumerator's training for two days before starting the enumeration. This training will be provided by the zonal officers; and
- 4) The enumerator's kit bag is to be collected from the supervisor after training. A Kit bag will contain 1 enumeration Questionnaire book, 2 pencils, 1 sharpener, 1 eraser and 2 lumber chalk sticks.

Functions during Enumeration

- 1) Enumeration to be done for the floating and transient population of the assigned EA during the census night.
- 2) Canvass are to be done to every household of his EA on census days of 2021 and filling out the census questionnaires for each household adopting the procedures mentioned below:
 - a) To introduce himself to the household members by showing his identity card;
 - b) Ask all questions of the questionnaire and record answers correctly;
 - c) Count all members of household who are present in the household at the census night;
 - d) Determine, through probing questions, reliable answers with regard to the age of the household members;
 - e) Record correctly particulars of EA in the Questionnaire – its identification address and number and
 - f) Smudge correctly the oval for every answers in the questionnaire.

Post-enumeration functions

- 1) Check all the household of his EA are enumerated;
- 2) Make sure that no household falling on the border of adjacent EA are left uncounted during enumeration;
- 3) Check that mistakes done in any filled-in questionnaire are corrected;
- 4) Fill out the EA tally/summary sheet as it appears in the cover page of the questionnaire book. The data in the tally/summary sheet should be entered by the enumerator at the field level through the mobile application.
- 5) Return all completed and corrected questionnaires and EA maps to supervisor after field operation; and
- 6) Receive honorarium from the Zonal Officer at the Upazila headquarters. For supervising the enumeration work of every five to six enumerators, one supervisor will be appointed. This ratio of supervisors to enumerators will be finalized through test pilot and pilot of census framework. The appointment of the supervisors will be made by zonal officers through field visits by issuing the appointment cards supplied by the headquarters. These appointment cards are also used as identity cards during census enumeration. It will make sure that appointed supervisor will be a person living within his area of supervision. Supervisors will be shown his supervision area (5 EAs on average) and will be introduced to the enumerators who worked with him. The appointments of supervisors will be made in consultation with the local union council Chairman/ Member or Municipal Chairman/Ward Commissioner and public representatives.

The functions of the supervisors will be as follows:

Pre-Census functions:

- 1) To attend the training sessions arranged by zonal officers at the local training centers along with the enumerators for two days;
- 2) To collect supervisor's kit bag from zonal officer after the training;
- 3) To organize group discussion with the enumerators and set strategies for enumeration; and
- 4) After training, the enumerators will be taken to the field to be acquainted with EA boundaries with the help of EA maps.

Functions during enumeration

- 1) On the day of enumeration, make on-spot verification of enumeration of 5 households for each enumerator. In the afternoon, there will be a group discussion with the enumerators and to give clearance for enumeration with suggestions where necessary.
- 2) Met every enumerator working under him and visit to every EA assigned to him and filled out the questionnaires by interviewing the head (in his absence, the most knowledgeable member) of the household.
- 3) Verify at least 10 (ten) filled-in questionnaires of every one of his enumerators every day and sign on the back page of those questionnaires verified by him.
- 4) Solve the enumeration problems when encountered by any enumerator in any EA, if necessary seek help from the local people or Union/Upazila Census Committee Chairman.
- 5) Look after enumeration work of all enumerators and particularly ensured the following (by every enumerator);
 - a) Ask all questions in the questionnaire and correctly record all answers;
 - b) Count all members of the household who are present at the census night;
 - c) Determined, through probing questions, reliable answers for ages of household members;
 - d) Record correctly the particulars of EA in the questionnaire: its identification, address and number;
 - e) Checked whether smudged relevant oval correctly for every answer in the questionnaire.
- 6) Check out that all households of an EA were enumerated by an enumerator.
- 7) Ensure that floating and transient people are counted completely during the census night.
- 8) Make sure that households falling on borders of any 2 EAs are counted during enumeration and also make certain that there are no duplication of counts in such cases.

Post-enumeration function:

- 1) Collect, after enumeration, all the filled-in questionnaire from enumerators.
- 2) Examine, if enumerators correctly fill-in questionnaires, and mark correctly all answers. For any mistake in any filled-in questionnaire, the concerned enumerator will be asked to correct such mistake.
- 3) Prepare summary of results of his supervision area in Form Pop-6.

- 4) Return all completed and corrected questionnaires along with summary results and maps to zonal officers on the specific date at the Upazila headquarters.
- 5) Receive honorarium from the zonal officer.

7.5.6 Formation of Census Committees

To conduct and complete the census with the active participation of local administration, census committees will be formed at Division, Zila, Upazila, City Corporation, Municipalities, Union/Ward level according to Survey/Census Committee formed by the Cabinet Division. The committee may co-opt other members if deemed necessary.

7.6 Publicity

Co-operation, motivation and participation of the people is a must to make the census a success. To attain this co-operation, people should be motivated for volunteering in a census. Citizens, particularly the local leaders are to be educated about the need and objectives of the census and about their responsibilities in census operation. They should know the census date and the need for co-operation in census work. They should also know that the information they provide are treated as strictly confidential. For their awareness and education about all these, publicity of entire census operation should be planned and publicity programme implementations are to carry out utilizing all the government and private sources available in the country.

A publicity sub-committee are to be formed by the Director General of BBS to prepare a detailed publicity plan and to recommend suitable publicity measures for creating awareness and a sense of voluntary participation among the people. On the eve of the census, the Director General, BBS who is also the ex-officio Census Commissioner will give an address to the nation through radio and all national and international private TV channels for providing cooperation and correct information to the census workers. Television discussions, debates are to be held on utility of census data for creation of public awareness about the census. A press conference should be held prior to census enumeration where representatives of radio, television, newspaper and other mass media are present. As a result, the importance of the census and the need for providing accurate information to census workers should be published in daily newspapers in the front page and in radio and television as a major news item. A regular publicity campaign are to be organized during census enumeration period which included the following:

- i. Publicity through postering in hats, bazars, schools and all public places;
- ii. Micing and drum beating in all EAs and public places;
- iii. Distribution of Census Brochures to the meetings of census committees, teachers of educational Institutions, public representatives and other educated people;
- iv. Circulation of census calendars in all educational institutions and offices;
- v. Distribution of pamphlets in public places;
- vi. Pasting of adhesive sticker on all types of vehicles;
- vii. Showing cinema slides, census films, TV slides in cinema halls, public places by mobile vans, projector & television and broadcast radio talks and jingle through Bangladesh Betar;
- viii. Publishing of census news in daily newspapers on regular basis;
- ix. Advertisement through Radio and all national and international private TV Channels;
- x. Publicity through publishing of supplement in the daily news and
- xi. Introduction of Census memorandum Postal Stamp/Tickets etc.

7.7 Main Census Activities

7.7.1 Timing for Main Enumeration

In 2021 population census, the population across the country will counted at a stretch for seven days during 01-10 March 2021 using different modes/ICR machine readable questionnaire. The counting began at zero hour of 01 March, 2021. Floating and transient people were counted from zero-hour till 6.00 AM (the night is called census night) at the places where they were found passing the night. In case of households, on the other hand, all members were enumerated in their residences. The de-jure method will be followed in counting, i.e. every person who are usual residence of the household.

7.7.2 Post Enumeration Check (PEC)

To assess coverage of the census an effectively designed Post Enumeration Check (PEC) survey needs to be conducted just one month after completing the census field operation. It will be outsourced through single source bases. The PEC survey data will be conducted after one month of the main census operation. The net under coverage rates were estimated separately for national level aggregate and also for level of rural, urban, other urban (Upazila Headquarters) and City Corporation areas.

7.7.3 Socio-economic Demographic Survey (Long Questionnaire) Survey

A Socio-economic Demographic Survey (Long Questionnaire) Survey with comprehensive information coverage (large scale sample survey) would be carried out at the last phase of census with the detailed data relating to population and household characteristics including fertility, mortality, and migration. An ICR formatted long questionnaire will be adopted in this survey of 2021 census to supplement the data of the main census.

7.7.4 Tabulation Plan

The tabulations plan for Population and Housing Census 2021 need to be prepared for census and sample census questionnaire. Based on this tabulation plan tabulation applications are to be developed in such a way that immediately after the getting the on-line census data, tables can be printed out. The census questionnaire would be a short questionnaire, which would be used to collect basic characteristics of housing and population. The sample census questionnaire would be the multi-modular long questionnaire to collect information on housing, population and its demographic and social characteristics through sample survey.

7.8 Data Capturing and Processing

One of the most important phases of census undertaking is data processing. Careful planning and timely execution of every aspect of processing is very important for the success of the census.

The adoption of Intelligence Character Recognition (ICR) strategy will be adopted census data capturing. BBS had gathered experience in OMR and OCR techniques of data capturing from earlier censuses of 1981, 1991, 2001 & 2011. The ICR technology was introduced in 2011 census. US Census Bureau supported BBS in using CSPro and iCADE (Integrated Computer Assisted Data Entry) system for data capturing. For analyzing and tabulating census data CSPro software was used. US Bureau of Census will be invited to capture and process data subject to availability of fund.

7.9 Editing Phase

An editing operation will have to be done under the close supervision of Bangladesh Bureau of Statistics headquarter for 2021 census. Specific information about every household and all the individual members of the household were collected through the census enumeration by administering ICR readable modular questionnaire. Before capturing data through the ICR machine, the filled-in questionnaires were thoroughly edited by trained editors. They were given specific instructions on

editing the filled-in census questionnaires as well as the summary tally sheets since manual editing is a very important step before mechanical processing. In this step every editor had to ensure that:

- i) All the census books were available in good condition;
- ii) Every book carried the correct geo-code;
- iii) Making system and the intensity was in conformity with the machine requirement\;
- iv) All questions had been answered and shaded properly; and v) there was consistency among the answers.

7.9.1 Editing of Tally Sheets

Each and every census book may contain two tally sheets and both the tally sheets would be filled-in by the enumerators. Editing will be done in two phases. In the first phase, one tally sheet from every filled-in census book will be removed and edited quickly to transmit it to the ICR machine so that the preliminary census report based on the tally sheet figures can be published quickly.

7.9.2 Editing of Census Books

All the census books will be edited thoroughly in the second phase. Editing work will be assigned to Supervising Officers. A group of 20 to 30 staff members may be posted under the control of each Supervising Officer. Each group will be assigned the work of one administrative zila. After completion of the editing works of a zila they will be allotted to another zila.

In 2021 Census, the editing work may be done in two shifts. The first shift from 8:00 A.M to 2:00 P.M. and the second shift from 2:00 P.M. to 8:00 P.M. One and half year will be required to complete the manual editing work. All officers and staff members of the Census Wing and the Population Census Project 2021 will be fully deployed to complete the editing works as early as possible. In addition, staff members from other wings and projects of BBS will also be put under deputation to Census Wing and Population Census Project to complete the editing job quickly.

7.10 Procurement of Equipment

Under the technical and financial assistance of UNDP, UNFPA and other agencies necessary equipment, hardware and its accessories and other article such as papers for printing of questionnaires and reports can be procured for the Population Census Project 2021.

7.11 Printing of Tables

Three types of tables were printed as per tabulation plan, such as:

C Table: Household and population related tables were produced at the Community level and named as C tables

H Table: Household and housing unit related tables were abbreviated as H tables.

P Table: Population related tables were named as P tables

There were ten H tables (H01 to H10) and fourteen P table (P01 to P14) printed in Zila census reports and fifteen C tables (C01 to C015) printed in the community census reports.

7.12 Publication Plan

The census might to be completed only when the information collected and compiled has been placed in the hands of those who would use it for practical purposes of decision making, research, policy making, planning and other administrative purpose. In order to fulfil the objectives, a publication plan will be chalked out to publish a series of publication with census results which were as follows:

A. Main Census	Completion Date
1. Preliminary Report	July, 2021
2. PEC Report	April, 2022
3. National Report	
3.1 Analytical Report (Volume 1)	2023
3.2 Union Statistics (Volume 2)	2023
3.3 Urban Area Report (Volume 3)	2023
3.4 Administrative Report (Volume 5)	2024
4. Zila Report (64 Volumes)	2024
5. Community Report (64 Volumes)	2024
B. Sample Survey	
Socio-Economic and Demographic Report (Volume 4)	2024
C. Census Monographs	
A total of 15 monographs are to be printed separately on the following broad areas.	2024
1. Reproductive Behaviour of Population – 3 volumes	
2. Special Protection Groups – 4 volumes	2024
3. Housing and Household Characteristics, Education and Literacy- 4 volumes	2024
4. Economic and Social Aspects of Population – 3 volumes	2024
D. Population Projection of Bangladesh (2021-2081)	2024
2.12 National Seminar for Population Census data Users	
In order to perceive the aspects of census data use, two user-produce dialogues are to be held prior to the census operation. In this meeting, opinions will give by the experts, researchers, academicians and data users. Accordingly, the relevant inputs will be incorporated where applicable in the framework of the census.	2017 and 2018
2.13 Dissemination of Census Results	
National Census results are to be released and in June, 2021. Zila wise Preliminary census data and at the lower level up to the Mauza and village are to be disseminated for 64 Zilas in the BBS web site for general use.	2022

Annexure-A

Preliminary Cost Estimate

Taka in Lakh

Economic Code	Economic Sub-code	Economic Sub-code wise Item Description	Unit	Quantity	Total Cost* (7+8+9+10+11+12+13)	GoB FE	Project Aid				Own Fund	Others (To be mentioned)	% of Total Project Cost	
							RPA		DPA		FE			
							Through GoB	Special Account	Through PD	Through DP	(DPA)			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	
(A) Revenue Components:														
3111	3111101	Basic Pay and Allowances (Officer)	-	-	45.36	45.36	-	-	-	-	-	-	-	0.01
3111	3111201	Basic Pay and Allowances (Employee)	-	-	10,086.49	10,086.49	-	-	-	-	-	-	-	2.88
3111	3111327	Overtime	-	-	231.38	231.38	-	-	-	-	-	-	-	0.07
3111	3111332	Honorarium/remuneration for employees	-	-	127.37	127.37	-	-	-	-	-	-	-	0.04
3211	3211106	Entertainment Cost	-	-	23,168.98	23,168.98	-	-	-	-	-	-	-	6.62
3211	3211107	Hiring Charges	-	-	7,501.00	7,501.00	-	-	-	-	-	-	-	2.14
3211	3211109	Labour wages to non-employees	-	-	120.00	120.00	-	-	-	-	-	-	-	0.03
3211	3211111	Seminar, Conference Expenses	-	-	425.75	175.75	-	-	-	250.00	-	-	-	0.12
3211	3211116	Courier	-	-	100.00	100.00	-	-	-	-	-	-	-	0.03
3211	3211117	Telex/Fax/Internet	-	-	1,415.20	1,415.20	-	-	-	-	-	-	-	0.40
3211	3211120	Telephones	-	-	4,003.60	4,003.60	-	-	-	-	-	-	-	1.14
3211	3211125	Advertising Expenses	-	-	7,138.50	6,338.50	-	-	-	800.00	-	-	-	2.04
3211	3211126	Audio-video, Film Production	-	-	210.00	60.00	-	-	-	150.00	-	-	-	0.06
3211	3211127	Books and Periodicals	-	-	5.00	5.00	-	-	-	-	-	-	-	0.00
3221	3221106	Freight and Transport Charges	-	-	752.00	752.00	-	-	-	-	-	-	-	0.21
3221	3221108	Bank Charges	-	-	3,140.00	3,140.00	-	-	-	-	-	-	-	0.90
3231	3231101	Foreign Training	-	-	475.00	-	-	-	-	475.00	-	-	-	0.14
3231	3231201	Domestic Training	-	-	47,190.44	46,690.44	-	-	-	500.00	-	-	-	13.48
3241	3241101	Domestic Travel Expenses (including advance)	-	-	4,174.66	4,174.66	-	-	-	-	-	-	-	1.19
3243	3243101	Petrol, Oil and Lubricant	-	-	255.00	255.00	-	-	-	-	-	-	-	0.07
3243	3243102	Gas and Fuel	-	-	316.50	316.50	-	-	-	-	-	-	-	0.09
3255	3255101	Computer Consumables	-	-	598.70	23.70	-	-	-	575.00	-	-	-	0.17
3255	3255102	Printing & Binding	-	-	69,313.16	29,313.16	-	-	-	40,000.00	-	-	-	19.80
3255	3255104	Stationery, Seals and Stamps	-	-	14,893.50	4,893.50	-	-	-	10,000.00	-	-	-	4.26

Economic Code	Economic Sub-code	Economic Sub-code wise Item Description	Unit	Quantity	Total Cost* (7+8+9+10+11+12+13)	GoB FE	Project Aid				Own Fund FE (DPA)	Others (To be mentioned)	% of Total Project Cost	
							RPA		DPA					
							Through GoB	Special Account	Through PD	Through DP	8	9		10
1	2	3	4	5	6	7	8	9	10	11	12	13	14	
3255	3255106	Map	-	-	4,070.00	4,070.00	-	-	-	-	-	-	-	1.16
3257	3257101	Consultancy	-	-	1,050.00	450.00	-	-	-	600.00	-	-	-	0.30
3257	3257104	Survey	-	-	125,017.05	90,017.05	-	-	-	35,000.00	-	-	-	35.72
3257	3257206	Honorarium/remuneration for other than employees	-	-	42.37	42.37	-	-	-	-	-	-	-	0.01
3258	3258101	Repairing & Maintenance of Transport vehicle	-	-	45.00	45.00	-	-	-	-	-	-	-	0.01
3258	3258102	Repairing & Maintenance of Furniture	-	-	4.00	4.00	-	-	-	-	-	-	-	0.00
3258	3258103	Repairing & Maintenance of Computer & Office equipment	-	-	5.00	5.00	-	-	-	-	-	-	-	0.00
3258	3258105	Repairing & Maintenance of Machineries and equipment	-	-	20.00	20.00	-	-	-	-	-	-	-	0.01
3821	3821101	Customs Duty	-	-	850.00	850.00	-	-	-	-	-	-	-	0.24
3821	3821104	Value Added Tax	-	-	150.00	150.00	-	-	-	-	-	-	-	0.04
3911	3911112	Unexpected expenditure	-	-	100.00	100.00	-	-	-	-	-	-	-	0.03
Sub-Total Revenue					327,041.01	2 38,691.01	-	-	-	8 8,350.00	-	-	-	93.44
(B) Capital Components:														
4112	4112101	Motor Vehicles	-	-	2,900.00	1,200.00	-	-	-	1,700.00	-	-	-	0.83
4112	4112202	Computer and Accessories	-	-	2,938.50	438.50	-	-	-	2,500.00	-	-	-	0.84
4112	4112310	Office Equipment	-	-	43.15	0.15	-	-	-	43.00	-	-	-	0.01
4112	4112314	Furniture	-	-	39.15	4.15	-	-	-	35.00	-	-	-	0.01
4113	4113301	Computer Software	-	-	1,004.50	104.50	-	-	-	900.00	-	-	-	0.29
Sub-Total Capital					6,925.30	1,747.30	-	-	-	5,178.00	-	-	-	1.98
(C) Physical Contingency					8,233.62	8,233.62	-	-	-	-	-	-	-	2.35
(D) Price Contingency					7,800.07	7,800.07	-	-	-	-	-	-	-	2.23
Total Estimated Expenditure					350,000.00	256,472.00	-	-	-	93,528.00	-	-	-	100.00