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United Nations Sub-regional Workshop
on Census Data Evaluation
14 – 17 November 2011
Phnom Penh, Cambodia

Final Report of the Workshop[1] (draft)

Prepared by

United Nations Statistics Division

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I. INTRODUCTION

A. Background and objective of the workshop

1. The United Nations Sub-regional workshop on evaluation of census data took place in Phnom Penh, Cambodia, from 14 to 17 November 2011. The Workshop was organized by the United Nations Statistics Division (UNSD), in collaboration with the Cambodia National Institute of Statistics. It was attended by 19 representatives from National Statistical Offices (NSOs) of 6 countries (Bangladesh, Cambodia, Lao People`s Democratic Republic, Myanmar, Timor-Leste, Viet Nam) in South East Asia and two experts from Japan International Cooperation Agency (JICA). (See Annex I for the list of participants)

2. The workshop constitutes an activity of the Development Account Project on Building Statistical Capacity in the Countries of Southeast Asia. The purpose of the Workshop was to strengthen the technical capacity of the participating countries to evaluate the quality of census data based on application of demographic techniques and in comparison with other data sources such as an earlier census, sample surveys or available administrative registers. This workshop also provided a forum to discuss possible types of errors in census data according to experiences and lessons learned among the participating countries.

B. Opening session

3. The workshop opened with a statement by H.E Mr. San Sy Than, Director of the Cambodia National Institute of Statistics. He welcomed the participants from five countries in the region, JICA experts and UNSD resource persons. He emphasized the importance of regional workshops and seminars for exchange of information among countries, for making medium and long-term national statistical planning and for better integration of national statistical system in the region. He noted that population and housing censuses were indispensible for information on population in the country at small geographical areas and for national planning. This workshop which focuses on census data evaluation is crucial to strengthening census data quality and to providing reliable data to national planning. H.E. San Sy Than concluded his speech by welcoming all the participants again and expressed his appreciation for the continuous support from UNSD on various statistical issues and in particular on census related activities including this one on census data evaluation.

4. Ms. Meryem Demirci from UNSD made an opening statement on behalf of Mr. Paul Cheung, the Director of UNSD. She provided some background information on the United Nations 2010 Census Work Programme and highlighted areas that regional and national technical assistance has been focusing on such as international guidelines for population and housing censuses, census management, cartography, data capture and processing, data analysis, dissemination and census evaluation. Ms. Demirci also introduced the development project for the region under which the current workshop was organized to improve the capacity of South-East Asian countries to produce and disseminate, on a regular basis, statistics required for national development planning and

for monitoring of the internationally agreed development goals. Ms. Demirci re-emphasized the importance of census data evaluation to (1) providing users with some measures of the quality of census data to help them interpret the results; (2) identifying as far as practicable the types and sources of error in order to assist the planning of future censuses; and (3) serving as a basis to construct a best estimate of census aggregates, such as the total population, or to provide census results adjusted to take into account identified errors. Ms. Demirci completed her statement by summarizing the objectives of the workshop and by welcoming the participants and expressed the appreciation for the collaboration effort provided by Cambodia National Institute of Statistics.

5. H.E. Ouk Chay, the Secretary of State, Ministry of Planning of Cambodia welcomed representative from UNSD, five national statistical offices and the JICA experts. He emphasized the importance of census taking and generating reliable census figures and indicators for Cambodia. He noted that the workshop provided an excellent opportunity for strengthening knowledge and capacity for national statistical offices and also for the improvement of living standard of population in the country when reliable census data were available.

C. Organization of the meeting

6. The meeting was conducted according to the Organization of Work (Annex II). The workshop started with an introduction presentation on the United Nations 2010 World Programme on Population and Housing Censuses and followed by country presentations on their experiences related to census data evaluation. More technical presentations by UNSD were presented on overall evaluation methods; evaluating census data on different topics such as age and sex distribution, fertility, mortality, migration and socioeconomic characteristics; and by using different techniques including comparing data using consecutive censuses. Hands-on exercises were included to help participants understanding better the tools and techniques introduced in earlier presentations. At the end of the workshop, each country made a presentation based on the results of their hands-on exercises using national census data. All presentations contributed by the participants and UNSD are available on the United Nations Statistics Division (UNSD) website[2].

7. Please note that the hands-on exercises on the evaluation of internal and international migration statistics and on the assessment of socio-economic characteristics (Session 13) were not conducted. Instead the assigned time period to the session was allocated to country presentations on the results of the other hands-on exercises carried out throughout the workshop.

8. The meeting was chaired by Mr. Meng Kimhor (Cambodia), Ms. Chanthalanouvong THIRAKHA (Lao, PDR), Mr. Aung Myint Than (Myanmar), Ms. Lan NGUYEN THI NGOC (Viet Nam) and Mr. Ashim Kumar Dey (Bangladesh).

[2] Please see:
http://unstats.un.org/unsd/demographic/meetings/wshops/Cambodia_Nov_2011/list_of_docs.htm

II. SUMMARY OF PRESENTATIONS AND DISCUSSIONS

A. The 2010 World Programme on Population and Housing Censuses (Session 2)

9. UNSD made a presentation on the 2010 World Programme on Population and Housing Censuses. The presentation introduced the three main objectives of the work programme: (a) agreeing on a set of international principles and recommendations to conduct a census; (b) facilitating countries to conduct at least one census within the period 2005-2014; and (c) assisting countries to disseminate census data in a timely manner. The presentation also provided an overview of the main UNSD activities that have been implemented to achieve the above three objectives. The activities include developing census related methodological guidelines and manuals, conducting expert group meetings, training workshops and advisory missions, developing the census data dissemination tool CensusInfo and providing census taking information and facilitating the sharing of national experiences through the census Knowledge Base.

B. Country Experience on Census Data Evaluation (Session 3)

Bangladesh

10. The most recent population census in Bangladesh was conducted during 15-19 March 2011. The census used the modified de-facto method. There were 25 questions on the census questionnaire, including 10 on household and housing characteristics and 15 on characteristics for individual household members. The topics covered type of household, tenancy of the house, source of drinking water, toilet facilities, electricity connection, age, sex, marital status, fertility, mortality, religion, education, economic activities, ethnicity and disability.

11. A post enumeration survey was conducted during the period of 10-14 April 2011 by Bangladesh Institute of Development Studies, an independent organization. The PES was used to assess the under- and over-coverage of the 2011 population census and to provide information on the accuracy of information collected in the census. The outcome of the PES will be used to make adjustment to census results. Accuracy for the following characteristics was assessed using the PES: type of main dwelling structure of the household; toilet facility; source of drinking water; electricity connection, age, sex, marital status and literacy. The result of the PES will be made public.

12. There was no mentioning in the presentation on the use of demographic methods for census data evaluation.

Cambodia

13. The latest population census of Cambodia was conducted in 2008. A post enumeration survey was conducted immediately after the census to assess the coverage and content errors of the census. A total of 9600 households and 46000 persons were covered by the PES. The PES showed that the net under-coverage rate was 2.77% for the entire country.

14. The PES was also used to assess the content errors in the 2008 census data collection. The topics covered by the PES include age, mother tongue, marital status, literacy, disability, main activity and secondary activity, children ever born and children surviving. The results showed that the Aggregate Index of Inconsistency (I_{AG}) varied from 5.6% for age to 43.2% for secondary activity. For the variable age, inconsistency was higher for age groups of 0-4, 5-9, 30-34 and older age groups 50 years and older. For marital status, there were big variations by categories in the consistency of the results from census and PES. The Index of Inconsistency was only 3.2% and 5.3% for never married and married categories, respectively. However the index reached 14% for the category widowed and separated and 25% for the divorced category. For children ever born and children surviving, the inconsistency between census and PES was larger for children surviving (ranging from 12% to 23%) than for children ever born (ranging from 7% to 17%).

Lao, People Democratic Republic

15. The most recent population census of Lao was conducted in 2005. The census was de-jure based and only Lao citizens and permanent residents were covered. The 2005 census questionnaire consisted of questions on 9 topics recommended by the United Nations including basic demographic characteristics of household members, education, economic activities, fertility, mortality, migration, disability and housing characteristics.

16. Population data obtained from the 2005 census are to be used for social and economic planning and monitoring for all regional levels in the country. Population census was also expected to work with the civil registration system which is closely linked to the existing village book system. Census can also be used to provide sampling frames for future surveys.

17. The main method of census data evaluation is through demographic analysis. Major fertility and mortality indicators were generated from census data and quality of census was evaluated accordingly. Population projection to the year 2020 was carried out based on the fertility and mortality estimates generated from census. The evaluation was done by external consultant. Post enumeration survey was not conducted due to funding limitation.

18. From the census evaluation programme, it was shown that there was under-enumeration of live births (from the births in the last 12 months question). The main challenge faced by the country in evaluating census data was the lack of staff with necessary technical skills to conduct such evaluation.

Myanmar

19. The most recent population census in Myanmar was conducted in 1983. The census used both short and long forms to collect information. The short form consisted of 7 questions and the long form 18 questions. A Post Enumeration Check (PEC) was conducted one year after the 1983 census to evaluate the census coverage and content accuracy. The results showed that the census covered 99.6% of the household and 99.1% of the total population in the country.

20. The presentation also showed the calculated Whipple's index and Myer's index, which showed that age reporting for urban area was much better for urban area than for rural area: the whipple's index was 114.4 for male population in urban area and 151.5 for male population in rural area. Both indices showed slightly higher value for females than for males.

21. A number of sample surveys were conducted after the 1983 population census. They included: 1991 Population Changes and Fertility Survey, 1997 Fertility and Reproductive Health Survey, 1999 National Mortality Survey, 2001 Fertility and Reproductive Health Survey and the 2007 Fertility and Reproductive Health Survey. A population census is now being planned to be conducted in 2014 and technical assistance is needed in all aspects of census operation and in census data analysis.

Timor-Leste

22. The most recent population census in Timor-Leste was conducted in 2010. So far one preliminary report of the census results was released in October 2010 and three additional census detailed reports and census data sheet were finalized. The detailed census reports cover information on population by age and sex, marital status, education, religion, citizenship, mother tongue, migration, labour force participation, disability, housing conditions, household amenities, birth registration for children under 5 years of age, place of delivery and assistance for the last live birth, production of crops and the size of live stocks. Basic tabulations were also produced at suco level for 442 sucos in the country.

23. There was no mentioning of census data evaluation, either using the PES or demographic methods.

Viet Nam

24. The most recent population census in Viet Nam was conducted in 2009. The census collected information through a short form for the entire population and a long form for 15% of the population. The short form collects information on basic characteristics of household members such as age, sex, ethnicity, religion, education and housing characteristics. The long form collects all above information with additional questions on economic activities, fertility, mortality, disability and more detailed housing information.

25. Census questionnaires and related materials such as training manuals were tested in three pre-tests and one pilot census before they were used formally for the census.

26. Regarding census coverage and content evaluation, both the post enumeration survey (PES) and demographic methods were used. PES was mainly used to assess the census coverage. During the PES, each usual household member was asked four questions: (a) full name; (b) relationship with the head of household; (c) sex; and (d) month and year of birth or age. Responses from the PES were compared with census questionnaires to assess the level of under- or over-enumeration of population during the census. The PES results of the 2009 census showed that there was a 0.3% of over-count

in the 2009 census. The net error varied by region in the country, with the Northern Midlands and Mountain areas as well as Red River Delta region had the highest net over-count of 0.7% and the Central Highlands area had the net under-count rate of 0.5%.

27. Demographic methods were used to evaluate and analyze census data. Population size and age and sex structure were studied. Fertility and mortality indicators such as crude birth rate (CBR), total fertility rate (TFR), crude death rate (CDR) and infant mortality rate (IMR) were derived from the 2009 census data and compared with those derived from the 1999 Viet Nam census. The Trussell P/F ratio technique was used to derive age-specific fertility rate and TFR by using data on children ever born and births in the last 12 months collected from the census.

28. The General Growth Balance (GGB), Synthetic Extinct Generation (SEG) methods and a combination of the two methods were used to assess the level of under-coverage of household deaths collected from the 2009 census. The results showed that the coverage of deaths derived from the household death question was 67% and 54% for male and female deaths, respectively by using the combination of the GGB and SEG methods.

29. For infant and child mortality evaluation and estimates, the Brass technique was used to derive infant mortality rate (1q0) and then use model life table (Coale-Demeny north model life table) to estimate both the child mortality (4q1) the life expectancy at birth.

30. The challenges faced by Viet Nam in census data evaluation and analysis is that the above modeling techniques do not seem to apply to well with the low level of fertility and mortality levels in the country. For example the P/F ratio method for fertility estimates requires relatively constant fertility level over a period of time and does not work very well with countries having fast declining fertility. Similarly when IMR gets very low in the country, the applicability of the Brass technique to derive infant and child mortality needs to be further investigated. The GGB and SEG methods for adult mortality only work for estimates at the country level because of the no-migration assumption for the models. Therefore those methods would not work for sub-national level estimates.

C. Overview of methods of census evaluation (Session 4)

31. In this session, UNSD made a presentation providing an overview of the methods for census evaluation. The presentation first reviewed the purposes of census evaluation including (a) providing users with some information of data quality; (b) identifying types of errors for future improvement and (c) obtaining a basis for some possible census figure adjustment. The presentation also emphasized that census data evaluation should be an integral part of entire census programme and the scope of the evaluation should be determined at the census planning stage. The presentation further explained briefly the institutional arrangement for census evaluation such as how the evaluation team should be formed.

32. The second part of the presentation introduced the types of errors occurring in census taking and possible methods for assessing the quality of census data. There are two types of errors in census taking – coverage error and content error. The error can occur at any stage of census taking. For census evaluation, one can use census data alone or in combination with other sources. When only census data are used, both demographic analysis and interpenetration study can be used to evaluate the census data quality. Census data may also be compared with other data sources such as sample surveys and administrative records. The comparison can be made based on derived indicators (demographic analysis) or by matching individual records. Advantages and limitations of each evaluation method were also discussed in the presentation.

D. Evaluation of age and sex distribution (Session 5)

33. A presentation was made by UNSD on the evaluation of age and sex distribution. The presentation first emphasized the importance of accurate age and sex data for understanding all other characteristics of population through information collected in population censuses. Therefore the age and sex distribution collected from census should be evaluated to understand possible errors such as age misreporting or under-coverage of certain population groups. The evaluation is also crucial in studying the impact of extraordinary event such as war, natural disaster or femine on the age and sex structure of the population.

34. The presentation introduced various methods that can be used to evaluate population data by age and sex. They include: (a) population pyramid; (b) graphic cohort analysis; (c) age ratios; (d) sex ratios; (e) Whipple's Index and (f) Myers' Blended Method. Advantages and limitations for each method were discussed in the presentation.

E. Evaluation of fertility data (Session 6)

35. The UNSD presentation in this Session focuses on the evaluation of fertility data obtained through two types of questions usually being asked in a population census: (a) children ever born and (b) recent births in the household. For each type of question, the following topics were covered: (a) how questions are usually asked on the census questionnaire; (b) fertility indicators that can be derived from the question; (c) possible quality issues related to each question and (d) data evaluation methods.

36. For evaluating data on children ever born, the presentation noted that initial assessment such as careful examination of raw data on children ever born and other related variables such as mother's age and sex of the child was necessary to obtain some information on the overall quality of the children ever born data. When tabulated data are available, additional checks can be done. These include: (a) comparing sex ratio at birth generated from children ever born data with perceived value in the country; (b) checking whether females with parity not stated were childless instead by using the El-Badry method; (c) studying the plausibility of data by making graphs of mean children ever born data by age of mother, by conducting graphical cohort analysis of mean number of children ever born obtained from multiple data sources and by comparing age specific

fertility rates and total fertility rates (TFR) with other sources such as an earlier population census or household surveys.

37. Similar approaches such as initial assessment of raw data on recent births, conducting graphical analysis of age-specific fertility rates and TFR in comparison with other data sources can be used to evaluate the data on recent births collected in population censuses.

38. The presentation also provided an overview of the original Brass P/F ratio method that was derived to produce a reasonable fertility estimate. The rational behind the method as well as the underlying assumptions were explained. The use of the MortPak CEBPF was demonstrated in calculating the P/F ratio, in assessing the quality of both the children ever born and recent births data and in estimating fertility level.

F. Hands-on exercises on evaluation of age and sex distribution and fertility data (Session 7)

39. The hands-on exercises session was divided into two sub-sessions and the first one dedicated to the evaluation of age and sex distribution and the second one to the evaluation of fertility data generated from population censuses. Each participating country was encouraged to use their most recent national census data and when comparison with other data sources was needed, countries may use similar data from previous censuses or household surveys.

<u>Age and Sex Distribution</u>

A. Data required
    a) Population by five year age group and sex for two consecutive censuses
    b) Population by single year of age and sex for two consecutive censuses

B. Prepare the following analysis
    a) Population pyramid by single age
    b) Population pyramid by five year age group
    c) Graphical cohort analysis
    d) Application of Wipple`s Index

C. Interpret the results of evaluation of age-sex structure

<u>Children ever born and recent birth data:</u>

A. Calculate sex-ratio at birth by age group of mother based on children ever born data
B. Direct calculation of age-specific fertility rate and TFR from recent birth data
C. Indirect estimate of age-specific fertility rate and TFR using MortPak FERTPF (P/F ratio method) using children ever-born and recent birth data
D. Graphs to be made:
    a) Sex ratio at birth by age group of mother
    b) Mean children ever born by mother’s age, with other sources

c) Age-specific fertility rate, calculated through direct and indirect methods, and other sources
d) TFR, calculated through direct and indirect methods, and other sources

G. Evaluation of mortality data (Session 8)

40. The UNSD presentation in this Session focuses on the evaluation of mortality data obtained through two types of questions usually being asked in a population census: (a) survival of children ever born and (b) recent deaths in the household. Most of the discussion in this Session focuses on the survival of children ever born.

41. As indicated in the presentation, survival of children ever born is often used to derive mortality of child (under 5 years of age). Various aspects of the Brass type estimates of child mortality using the survival of children ever born data were explained. For example, the presentation discussed the rational behind the method, assumptions behind the modeling, the use of MortPak CEBCS application to derive child and infant mortality estimates, as well as ways to choose from different model life tables based on the mortality situation in the country.

42. The presentation noted that initial assessment such as careful examination of raw data on children ever born and surviving and other related variables such as mother's age and sex of the child was necessary to obtain information on the overall quality of the children ever born and surviving data. Additional checks can be done on tabulated data. They include comparing children ever born and children surviving data; comparing the proportion of deceased children derived from the census with the same indicator derived from other sources; and comparing derived child mortality estimates with those published by other agencies such as the United Nations Population Division and UNICEF.

43. Regarding the estimates of adult mortality, the presentation reviewed the use of the question on household deaths in deriving adult mortality estimates and possible quality issues related to the data collected. Comparing age-specific mortality rates derived from the household deaths question with those from other sources such as a household survey may provide some insights on the relative coverage of death reporting in the census. Other methods such as Generalized Growth Balance method (GBB) and Synthetic Extinct Generations Method (SEG) were explained briefly in their use of assessing the coverage of death reporting and the required assumptions behind those methods.

H. Evaluation of data using consecutive censuses (Session 9)

44. The presentation made by UNSD reviewed three methods to evaluate census coverage by using data from two consecutive censuses: (a) population balancing equation; (b) cohort component method and (c) inter-censal cohort survival rates.

45. The rational behind the population balancing equation is quite straightforward. According to the population balance equation, population at second census should be equal to the population at the first census, plus births and minus deaths occurred in between the two census periods and then plus net in-migration in the same period.

Therefore if information on the inter-censal births, deaths and migration are available, the under or over-coverage of the second census relative to the first one can be derived. This method is easy to use, however with certain limitations. First, accurate birth, death and migration figures are not easy to obtain, which in turn will have an impact on the reliability of the census population coverage estimate. Second, this method applies mainly to coverage assessment at national level because it is very difficult to obtain information on internal migration, which is required to do regional or lower geographical levels assessment.

46. The cohort component method compares the "expected" population based on the projection from the population in the first census, with additional information on the inter-censal fertility, mortality and net international migration. Detailed steps of calculation were introduced in the presentation. Illustration was made of how the MortPak PROJCT procedure can be used when the population, fertility, mortality and net migration elements are available. The presentation then reviewed the results using the cohort component method for three countries – Philippines, Indonesia and Turkey and demonstrated how the results can be interpreted.

47. The inter-censal cohort survival rate method compares the size of birth cohorts enumerated in successive population censuses. In the absence of census errors and significant migration, the ratio of the number of persons enumerated in the second census to the first census should approximate the survival rate that would be expected on the basis of mortality conditions. When there is substantial migration into the country (or the area of interest), the expected survival rate needs to be modified to reflect the impact of migration on population size. Advantages and limitations of the method were discussed at the end of the presentation.

I. Hands-on exercises on evaluation of mortality data and on the use of consecutive censuses to assess census data quality (Session 10)

48. The hands-on exercises session was divided into two sub-sessions and the first one dedicated to the evaluation of mortality data and the second one to the evaluation of census data using consecutive censuses. Each participating country was encouraged to use their most recent national census data and for mortality data evaluation, countries were also encouraged to compare results and indicators with other data sources such as an earlier census or a household survey.

Child mortality based on children ever born/surviving data:

A. Calculate the proportion of deceased children (1- children surviving/children ever born) by age
B. Calculate indirect estimates of child mortality (Brass type method), using MortPak CEBCS application
C. Graphs to be made:
    a) Proportion of deceased children by age, with other sources
D. Look for outside sources:
    a) United Nations Population Division (http://esa.un.org/unpd/wpp/unpp/panel_population.htm)

b) United Nations Children's Fund (http://www.childmortality.org/)

Hands-on Exercise on Cohort Component Method

A. Data required for the Method
   a. Population by five year age group and sex for two consecutive censuses
   b. Total fertility rate for intercensal period
   c. Age specific rate for intercensal period
   d. Life expectancy at birth by sex for intercensal period
   e. Probability of death by sex. If this information is not available pattern of model life table representing mortality structure of the country
   f. If international migration is significant, net migration by age group and sex
B. "PROJCT" (Single year projection program) module of the MORTPAK will be used to estimate single year population by age group and sex
C. The estimated population by age group and sex will be compared with the population enumerated in the second census (by age group and sex). Percentage differences between the estimated and enumerated population (by age group and sex) will be calculated.
D. Graphic presentation of the percentage differences will be prepared
E. Main findings on the coverage of the second census will be discusses.

J. Evaluation of internal and international migration data (Session 11)

49. The presentation made by UNSD first reviewed common concepts used in measuring internal migration such as place of usual residence, life time and recent migration and explained the difference between move and migration. The presentation then described the direct and indirect methods of estimating internal migration within a country. The direct method refers to the use of questions related to migration in a census such as place of birth, place of residence at a specified time in the past, duration of residence and place of previous residence. For each question, discussion was provided on the possible tabulation on internal migration and related quality issues.

50. The presentation also explained ways of estimating net internal migration through indirect methods including the national growth rate method, vital statistics method and the survival rate method. All of these three methods use data obtained from consecutive censuses. The national growth rate method assumes equal natural increase rate across regions in the country and the same net immigration rate from abroad to all regions in the country. Then the net inter-censal internal migration rate to one region equals to the growth rate for the region (rate of population growth from the first to the second census) minus the growth rate for the entire country. The vital statistics method assumes the same natural increase rate across all regions in the country. Then the net inter-censal migration rate (including both internal and international) is the difference between the regional population growth rate and the natural increase rate in the country. The survival rate method requires data on the survival ratio of population from the first census to the second for all age groups. Then the difference between the expected population in the

second census and the enumerated population will be the net migration. The presentation also highlighted concerns and possible errors when indirect methods were used.

51. The presentation did not cover information related to international migration. One comment was made regarding the use of the question on place of residence at a specified time in the past. It was noted that countries usually choose to ask place of residence one year ago so the obtained migration flow data can be used directly for population estimates and projections.

K. Consistency checks for social and economic characteristics of population (Session 12)

52. The presentation on the evaluation of socioeconomic characteristics of population obtained through censuses was made by UNSD. The presentation first outlined the core socioeconomic characteristics that were recommended by the United Nations Principles and Recommendations for Population and Housing Censuses, Rev. 2. The core items cover characteristics on household and family, demographic and social aspects, education and economic activities.

53. It was highlighted that several tools can be used to assess the quality of socioeconomic characteristics of population collected from censuses. They include: (a) checking internal consistency of data by reviewing tabulations and cross tabulations with other relevant characteristics; (b) comparing generated indicators with those derived from other data sources such as household surveys and administrative records; and (c) comparing with other sources by conducting re-interview surveys where people are re-interviewed and content of the census responses is verified. The use of assessment tools were demonstrated via examples on data on population by household size, population by marital status, literacy rate and unemployment rate.

L. Adjusting census figures (Session 14)

54. The presentation made by UNSD discussed issues related to adjusting census figures. They include the reasons for adjusting census figures, what figures are usually adjusted and how the adjustment can be done.

55. Census figures are usually adjusted for several reasons: (a) when there was substantial errors, i.e., over or under-count in the census counts; (b) coverage of certain population groups is deficient and some parts of the country might be disadvantaged in government funds and/or representative seats allocation; and (c) census count is used for future intercensal estimates and projections.

56. The adjustment may be carried out on the total count of the population in the country. Sometimes further adjustment is possible to adjustment basic population distributions, by major civil division, age, and/or sex. The basis for the adjustment is census evaluation studies such as post enumeration survey or assessment using demographic techniques. Coverage rate can be used directly to adjust population size. The method of synthetic estimation and regression can be used for further adjustment and

was explained in the presentation. The presentation also highlighted several considerations before adjusting census figures.

M. Presentations of countries on the result of hands-on exercises

57. Sessions 7 and 10 were dedicated to hands-on exercises when participants evaluated their census data using some of the demographic techniques presented during the workshop (see summary above of hands-on exercise sessions for more details on the techniques to be used). At the end of the workshop, participants were asked to present the results of the hands-on exercises.

58. Five presentations were made, among which Cambodia, Lao PDR, Timor-Leste and Viet Nam presented some of the exercises and evaluation results using their latest census data. Myanmar did not conduct any census recently so a presentation was made on the civil registration system in the country.

III. CONCLUSIONS AND RECOMMENDATIONS

59. The participants of the workshop agreed on the following conclusions and recommendations:

a. Participants recognized the importance of comprehensive and systematic census data evaluation in order to provide users with some measures of quality of census data, to identify types of error to assist the planning of future censuses and to provide a basis for constructing best estimates.

b. Participants appreciated UNSD's effort in organizing the workshop that explained in detail various demographic techniques and tools such as MortPak and PASEX in evaluating the census coverage and the content of census data such as age-sex distribution, fertility, mortality, migration and other socioeconomic characteristics.

c. Participants expressed that there was a need to build the capacity of national statistics office to undertake activities related to evaluation of census data based on demographic techniques and in comparison with other data sources.

d. Participants highlighted the needs for a technical report/guideline that provides an overview of possible demographic techniques for census data evaluation and also possible data sources to compare with census results. Participants also emphasized the need for technical assistance for application of these techniques.

ANNEX I. List of participants

No.	Country / Organization	Contact Person Information
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ANNEXT II. Programme of Work

Time	*Topic*
	Monday 14 November 2011
9:00 – 9:30	***Registration of participants***
9:30 – 10:00	**1 – Opening remarks** - Welcome remarks by H.E. San Sy Than, Director General of the National Institute of Statistics, Cambodia(NIS) - Complimentary Speech by Ms. Meryem Demerci, United Nations Statistics Division - Opening Speech by H.E. Ouk Chay, Secretary of State, Ministry of Planning, Cambodia - Introduction of participants and administrative matters
	Morning Session
10:00 -12:30	**2 – The 2010 World Programme on Population and Housing Censuses** The session introduces the objectives of the world programme on censuses and the UNSD activities to support this programme - Presentation by UNSD - Discussion **3 – Country Experience on Census Data Evaluation** The session presents the experience of participated countries on conducting census evaluation programme, methods used for evaluation, challenges for undertaking evaluation programme focusing on the experience of the last census conducted. - Presentation by countries (Cambodia, Lao People's Republic and Myanmar) - Discussion
12:30 – 13:30	***Lunch***
	Afternoon Session
13:30 – 17:00	**3 - Country Experience on Census Data Evaluation (cont.)** - Presentation by countries (Timor-Leste, Viet Nam and Bangladesh) - Discussion **4 - Overview of Methods of Census Evaluation** The session reviews the objectives and planning a census evaluation programme, types of census errors and methods of data evaluation including methods based on a single source, comparisons of data from two or more sources, demographic analysis using previous censuses, comparisons with other data sources, post enumeration survey, records checks, etc.) - Presentation by UNSD - Discussion

Time	*Topic*
	Tuesday 15 November 2011
	Morning Session
9:00 – 12:30	**5 – Evaluation of Age and Sex Distribution** The session covers demographic methods used for evaluation of age and sex structure of population including sex ratio, population pyramid, age ratios, Whipple index, Myers`s Blended method , Age accuracy index, Median age, Age dependency ratio, etc. This session also discusses types of errors in age and sex structure and their impacts on social and economic characteristics of population. - Presentation by UNSD - Discussion **6 – Evaluation of Fertility Data** The session discusses demographic methods used for evaluating quality of fertility data, indirect demographic methods to estimate indicators and comparison with previous censuses and other sources. - Presentation by UNSD - Discussion
12:30 – 13:30	***Lunch***
	Afternoon Session
13:30 –17:00	**7 – Hands-on exercise and country presentation** In the session, participants will apply demographic methods to evaluate age-sex structure and fertility data using actual data collected by their own censuses. They will also make a presentation to share and discuss the findings of this exercise.
	Wednesday 16 November 2011
	Morning Session
09:00 – 12:30	**8 – Evaluation of Mortality Data** The session discusses demographic methods used for evaluating quality of mortality data, indirect demographic methods to estimate indicators and comparison with previous censuses and other sources. - Presentation by UNSD - Discussion **9 – Evaluation of Census Data Using Consecutive Censuses** The session describes intercensal cohort component method and components of population change which can used to evaluate different types of census errors based on the results of consecutive censuses. - Presentation by UNSD - Discussion
	Lunch

Time	*Topic*
	Afternoon Session
13:30 – 17:00	**10 – Hands-on exercise and country presentation** In this session, participants will evaluate mortality data collected in their censuses and describe types of errors in census data based on comparison with other data sources available in the country. Participants will also be asked to evaluate census data from data collected through consecutive censuses. Participants will also make a presentation on their findings at the end of the exercise.
	Thursday 17 November 2011
	Morning Session
9:00 – 12:30	**11 – Evaluation of internal and international migration data** The session reviews definitions and methodologies used to collect data on internal and international migration in censuses and also how to evaluate migration data based on comparison with other sources; administrative registers, household surveys and previous censuses. - Presentation by UNSD - Discussion **12 - Consistency checks for social and economic characteristics of population** The session discuses possible methods to evaluate quality of data on social and economic characteristics of population collected in censuses based on consistency between the results of censuses and other sources of data. In this session, evaluation of social and economic characteristics of population such as literacy, school attendance, marital status, economic activity, unemployment, household structure are discussed. - Presentation by UNSD - Discussion **13- Hands-on exercise and country presentation** In this session, participants will evaluate internal migration data collected from population censuses as well as selected social and economic characteristics of population on basis of comparison with the results of other data sources. Participants will make a presentation for their findings.
12:30 – 13:30	***Lunch***
	Afternoon Session

Time	*Topic*
13:30 – 16:30	**14 – Adjusting census figures** This session discuses possible reason for adjusting census figures, methods of adjusting census results and statistical considerations for adjusting census figures. - Presentation by UNSD - Discussion **15 - Conclusion & Closing**