



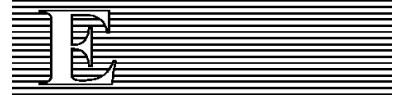
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**Assessment report on the 2010 round of population
and housing censuses in Africa**

Introduction

1. The 2010 round of population and housing censuses in Africa was an unprecedented success in terms of the number of countries that participated, with a total of 47 – 9 more than the 2000 round. The Democratic Republic of the Congo, the Comoros and Madagascar are planning to conduct a census in 2015. The census in Sierra Leone that was planned for 2014 had to be postponed owing to the Ebola crisis. The status of censuses in African countries in the past three rounds is given in the table below and in the Map in Annex 1.

Table

African countries and censuses

No. of countries that conducted censuses in:	1990 round	44
	2000 round	38
	2010 round	47
No. of countries that conducted censuses in all three rounds		30
No. of countries that conducted censuses in the 1990 and 2010 rounds but missed the 2000 round		8
No. of countries that conducted a census in the 2010 round after having missed the 1990 and 2000 rounds		4

2. One of the significant achievements of the 2010 round was that four countries that had missed the 1990 and 2000 rounds conducted a census in 2010. These countries are Angola (after 44 years), Djibouti (after 26 years), Liberia (after 24 years) and Togo (after 29 years). A number of other countries have not been able to adhere to the recommended ten-year gap between censuses.

3. The rejuvenation of the continental programme on censuses in the current round, from the disappointing 2000 round, in which 30 per cent of African countries did not conduct censuses, can in large part be attributed to the major advocacy campaign led by Statistics South Africa and supported by a number of pan-African institutions, including the Economic Commission for Africa (ECA), the African Union Commission (AUC) and the African Development Bank (AfDB), through the African Symposiums on Statistical Development, an initiative that began in 2006. Between 2006 and 2010, six such symposiums were held, with a focus on technical themes and encouraging national statistics offices to conduct censuses in the 2010 round. The United Nations Population Fund (UNFPA), the World Bank and other development partners played important roles at country levels by providing technical and financial support for conducting censuses.

4. Not only was the 2010 round a success in terms of the number of African countries that participated, but countries also improved the way in which they conducted the censuses, including better management, and technical, financial, logistical and in-country coordination. The coordinated approach at the continental level among the pan-African institutions and other development partners, with the active support of some national statistics offices in the area of capacity development, led to significant improvements in concepts and standards, management and operations, use of technology and quality.

I. Major pan-African initiatives

5. The six African Symposiums on Statistical Development that took place between 2006 and 2010 were one of the key drivers of the improvement seen in the 2010 round. Apart from providing impetus to the census programme on the continent, the Symposiums acted as a much-needed platform for cross-learning, through the exchange of best practices on management and planning, enumeration, data capture, processing, analysis and dissemination. The details of the African Symposiums on Statistical Development, including their themes, are set out in annex 3.

6. A series of expert group meetings and workshops were organized with a view to improving the capacity of African experts dealing with censuses in all segments of the census process. In addition, in collaboration with host national statistics offices and the pan-African institutions (ECA, AfDB, AUC), and quite often in partnership with the United Nations Statistics Division and UNFPA, a series of workshops and meetings were organized on various aspects of censuses. The list of such workshops and meetings is given in annex 2.

7. In order to harness the possibilities created by new technologies and to mainstream their use, countries sought technical assistance from other African countries. This was done through study tours and invitations to experts from other countries to visit and share their experiences. There are also a few examples of countries sharing equipment and technology for data capture and processing. UNFPA and the United Nations Statistics Division supported countries by providing the analysis and dissemination tools. ECA also provided advisory services to a number of countries, particularly in the area of cartography, data processing and dissemination.

8. ECA published the following four important publications in support of the ongoing capacity development efforts of countries in conducting censuses:

- (a) *Africa Addendum to the Principles and Recommendations for Population and Housing Censuses*, revision 2 (published in 2008);
- (b) *Guide on census planning and enumeration for African countries* (2010);
- (c) *African Census Tabulation, Dissemination, Analysis and Archiving Handbook* (2012);
- (d) *African Census Data Editing Handbook* (2012).

9. ECA and the University of Minnesota launched the African Integrated Census Microdata (AICMD) portal, which currently holds more than 72 million person records from 19 countries. The microdata are available to researchers and policymakers free of cost and can be obtained by simply registering and agreeing to the conditions of the user license, which include protection of statistical confidentiality and sharing of research results.

10. Between 2011 and 2012, the United Nations Statistics Division and the United States Census Bureau carried out a worldwide survey with the objective of collecting information on the lessons learned from the 2010 round of censuses. The main aspects that were covered by the survey were:

- (a) Census methodologies;
- (b) Technology;
- (c) Data dissemination;
- (d) Looking forward: successes and challenges, and international cooperation.

11. A total of 33 African countries took part in the questionnaire-based survey. In 2013, AfDB and ECA jointly conducted a detailed assessment in eight countries (referred to hereinafter as the special study) that focused on four major themes:

- (a) Planning and management;
- (b) Quality assurance;
- (c) Use of technology;
- (d) Processing, dissemination, analysis and use.

12. The eight countries where these in-depth assessments were carried out were Cabo Verde, Chad, Kenya, Malawi, Mali, Mozambique, South Africa and South Sudan. The present report sets out a consolidated review of the salient findings from the survey carried out by the United Nations Statistics Division and the United States Census Bureau, supplemented by the special study of the eight countries.

13. ECA also prepared a tally of the topics covered by the 42 African countries in the 2010 round of censuses and compared them with the core topics as recommended in the *Principles and Recommendations for Population and Housing Censuses*.

II. Summary of findings

14. The salient findings of the 2010 round of censuses and the above-mentioned studies have been consolidated under the following subheadings: planning and management; use of technology; quality assurance; and data dissemination and analysis.

A. Planning and management

15. Planning for the various phases of a census is essential to ensure its success. Careful planning and appropriate administrative arrangements are critical elements to ensure that each phase (pre-enumeration, enumeration and post-enumeration) is properly resourced and organized; that the output of each phase is of adequate quality for the next phase; and that the dependencies among the different phases are identified and planned for. It is important for the planning strategy to incorporate all of the elements that are central to the success of a census, including the budget, census calendar, management, organization, advocacy, publicity, quality assurance, census mapping and data processing and dissemination.

16. The special study showed that census plans were developed in all eight countries. While the plans varied in style, detail and extent of implementation, they all helped with resource mobilization and guiding the implementation of census activities. The planning in all of the countries involved consultations with stakeholders in a bid to ensure that the census project met the needs of end users. In most countries, planning started at least three years in advance, except in one country, where the project document was prepared just two years before the enumeration. The mapping exercise for the delineation of enumeration areas was delayed in two countries, which had a negative impact on the field work and most likely affected the quality of data in terms of coverage. Plans for post-enumeration surveys were not comprehensive and were not properly implemented in most of the countries, and were not conducted at all in one of the countries. Publicity campaigns in most countries were planned to start very close to the field enumeration, which may not have had the desired impact in terms of public participation.

17. In all eight countries, a number of management and technical committees were set up. In every case, the organization of the censuses included advisory or management committees at the national, regional and, in some countries, local levels. Technical committees were also set up. In a couple of countries, specialized technical working groups were formed on issues such as cartography, methodology, enumeration, administration, data processing, finance, analysis, archiving and communication. This implies that there was recognition that a census was a special, demanding and complex operation requiring unique management arrangements. In other words, it was not “business as usual”, as with other statistical activities, including surveys.

18. All eight countries carried out pilot censuses as a precursor to the main census. However, not all census processes were tested and in most countries testing was limited to just the questionnaire.

19. In the 2010 round, there was an overall improvement in government contributions to the census budget. In many countries, development partners provided technical and financial support for the censuses through the implementation of a joint programme. However, the implementation of some census activities was held back owing to delays in releasing funds, resulting in late completion of census mapping in three countries. The general delay in funding for some census activities delayed or compressed some census activities and may have compromised the quality of the census. In addition, for some countries, the mobilization of resources started somewhat late, affecting some of the census activities. This, coupled with the sporadic and late disbursement of funds, affected some of the preparatory work.

20. The other management challenge was the paucity of highly qualified staff in census methodology, which was often exacerbated by the turnover of relatively experienced staff during the inter-censal period. Only one of the eight countries prepared a comprehensive administrative report.

B. Use of technology

21. The 2010 round of censuses witnessed a quantum leap in the use of new technology in different aspects of census operations. These have no doubt resulted in major gains in terms of cost savings, timeliness and quality of census results and also helped in its overall management. Some of the technologies were the use of hand-held devices, global positioning systems (GPS), geographic information systems (GIS) software, low-cost aerial and satellite imagery, improved scanning applications, use of mobile telephones for better communication in the field, and bar codes on census materials to facilitate and track their movements.

22. According to the survey carried out by the United Nations Statistics Division and the United States Census Bureau, 61 per cent of the countries considered the use of new technology as the biggest success in the 2010 round. About 75 per cent of the countries reported that they had predicted cost and time savings thanks to the new technology and 73 per cent reported that their predications had proved correct. About 60 per cent of the countries reported that use of technology had resulted in time savings, followed by improved data quality (45 per cent), improved coverage (42 per cent) and cost savings (32 per cent). The GIS technology for cartography was used by 81 per cent of the countries followed by OMR/OCR technology for data capture through scanning.

23. According to the special study, all eight countries used GPS, GIS and remote sensing technologies in their cartographic work; three introduced digital mapping in their census operations for the first time. Almost all of the countries reported that the use of these technologies had resulted in gains in the timeliness, accuracy and effectiveness of the census cartography operation phase, and

that although the initial investment could be expensive, the final geo-referenced spatial information database provided more complete and current spatial information to create digital enumeration area maps for current and future use. There were, however, some technical and in-house capacity challenges in a few countries, resulting in time overruns.

24. Out of the eight countries, four used optical scanners for data entry, three continued with manual data entry and one used a Personal Digital Assistant (PDA) to directly capture data from the field. Two out of the four countries that used scanning technology for data capture were using it for the first time. Two countries used Optical Mark Reading (OMR) technology, one country used Optical Character Reading (OCR) and one used a combination of OMR, OCR and Intelligent Character Reading (ICR) technology. The scanning technology resulted in considerable shortening of the data capture time, allowing for analysis and dissemination of data in less time than in earlier censuses. The major challenge with regard to scanning technology was the lack of in-house operating and troubleshooting knowledge and experience of the national statistics offices, making them largely dependent on outside support. The pioneering work done in one country in the use of a PDA had its fair share of successes and challenges. Three more countries in Africa have followed suit and this will help to build a critical mass of experience on the use of modern data capture technology in future censuses.

25. The Internet was used in a big way in the dissemination of census results by almost all of the countries. While most of the countries used static webpages for dissemination of census results, some countries used web technology with GIS applications to disseminate census results. Very few provided users with an interactive online tool for accessing census data for analysis. Some countries offered a text-message-based query service for the public allowing access to the census results.

26. According to the survey carried out by the United Nations Statistics Division and the United States Census Bureau, 45 per cent of the countries said that lack of staff and expertise were obstacles to implementing new technology; 42 per cent of countries reported financial resources as an obstacle. The lack of expertise seemed to be one of the prime reasons for 63 per cent of countries opting to outsource the management and operations of one or many areas of census activities where new technology was adopted. The contractual agreements on outsourcing often came in the way of smooth implementation of the technology and countries had to depend heavily on the vendors for support, which was not always available locally.

C. Quality assurance

27. Quality assurance in censuses is aimed at preventing, reducing or limiting the occurrence of errors in censuses. A quality assurance programme should also be viewed as a quality improvement programme. Therefore, quality management should follow a comprehensive approach so as to ensure that all census activities are well planned, tested and monitored to ensure that they are carried out as expected. Ultimately, it is about meeting the needs of end users.

28. According to the special study, none of the countries prepared a comprehensive quality assurance plan that had clear strategies for quality management for each step of the census process, such as questionnaire design, training, field enumeration and data processing. However, all of the countries developed comprehensive project documents with the support of UNFPA. These documents covered all the steps of the census, including a detailed timetable. However, not all the countries updated the census timetable regularly. Three of the eight countries mentioned regular monitoring of the progress of the census project against milestones of the timetable, conducted by the census committee or a specific ad hoc committee.

29. All of the eight countries developed comprehensive quality control for the delineation of enumeration areas and preparation of corresponding maps. Quality controls were conducted in the field, with supervisors checking the work of field workers; and in the office, verifying in a GIS the consistency of the data gathered.

30. The design, content and length of the census questionnaire have a direct bearing on the quality of the data collected in the field. Six of the countries in the special study conducted extensive consultations with users, carried out several workshops and recognized that the involvement of stakeholders improved the quality of the questions and ensured their ownership of the questionnaire. Concepts and definitions were mostly in line with the international recommendations, in particular the *Principles and Recommendations on Population and Housing Censuses*. This ensured international comparability as well as coherence with other sources of statistics.

31. A pilot census should be conducted well ahead of the census period to test the whole operation and to ensure that there is enough time to take into consideration the lessons drawn from the pilot. Although all eight countries conducted a pilot census, only three tested the whole process; the others focused on enumeration operations. However, countries that processed and analysed the questionnaires of the pilot census were able to draw valuable lessons to improve the questionnaire. The countries that conducted the pilot census less than one year before the census could not integrate all of the lessons learned into the final design. For countries using scanning technology for data capture, the questionnaires filled in for the pilot census were very useful for fine-tuning the system.

32. All eight countries recruited enumerators and supervisors on the basis of educational criteria, which were generally higher for supervisors. Four countries called upon teachers to serve as field workers. Training a huge number of field workers poses considerable challenges and has a direct consequence on the quality of data collected, in terms of the coverage and quality of the responses to the questions. All countries organized cascading training, selecting carefully at least the first group of “master” trainers. One of the countries introduced practical exercises into the training sessions and provided trainers with a guide on how to conduct the training sessions. Evaluation of the trainees after the training was conducted before final recruitment, except in two countries. Less attention was paid to the training of data processing staff.

33. Post-enumeration surveys were conducted in four countries, but only one country conducted it successfully and was able to estimate the coverage of the census, although it did not prepare a report on the survey. One other country published a coverage rate, while recognizing important flaws in the processing of the survey. Among the difficulties mentioned was the lack of expertise and resources to conduct matching and reconciliation visits, and that too long a period had elapsed after the census

D. Data dissemination and analysis

34. Dissemination of census results in timely and user-friendly manner is vital. The public perception of a successful census is strongly tied to how quickly the results are made available and how easily they can be obtained by end users. In Africa, there has been a big improvement in the quality and timeliness of dissemination products and services.

35. In terms of products, printed reports are still the most common way of disseminating census results. More than 85 per cent of African countries used printed publications as the primary method of data dissemination.

36. Although a number of countries also used the Internet to disseminate census results, the degree of sophistication of Internet-based products and services varied considerably. For example, only one of the eight countries provided interactive GIS tools to data users for mapping and analysis. Most of the countries using the Internet for dissemination of census data offered only static webpages, with key census results in the form of census tables and downloadable reports.

37. Some countries used CensusInfo (developed by the United Nations Statistics Division) and other dissemination software for the user-friendly dissemination of census results. The other media used for dissemination included CDs, flash disks, leaflets and flyers. Data were also disseminated through special seminars and workshops, sometimes in partnership with academic and other institutions.

38. One of the weakest areas of dissemination of census results was the release of census microdata. Only two of the countries in the special study made 10 per cent of microdata available for public use.

39. Analysis of census results was mainly in form of analytical reports prepared by the census offices. Sometimes these analytical reports were prepared in collaboration with academic institutions, statistical training centres and individual experts. The reports were mainly thematic in nature and included the following areas: population structure, migration and urbanization, education, economic characteristics, fertility, mortality, disability, marital status, youth, women, elderly population, housing and living conditions of families.

III. Recommendations for the 2020 round of censuses

Planning and Management:

40. Funding remains a major challenge for many of the censuses in African countries, mainly because it is considered an ad hoc activity conducted only once every 10 years. Censuses should be a part of the national development plan of each country. This will help the census offices to develop a plan much further in advance, to seek an adequate budget from the Government and to mobilize resources from development partners.

41. The choice of technology to be used for censuses, particularly data capture, should be decided even before developing the plan. This is because it directly impacts all components of the census. For example, a plan for a PDA-based census will be different from a plan for census that will use scanning technology for capturing data.

42. A comprehensive data processing plan should be developed in advance before tabulations. This should also include data validation protocols with clear tolerance limits set for each set of consistency checks.

43. There is a need for training on all technical aspects of conducting a census, including cartography, editing, validation, data processing, dissemination and post-enumeration surveys. A systematic and sustainable approach needs to be adopted on the continent in order to build capacity in all areas. This can be achieved through the development of centres of excellence in Africa to build long-term institutional capacities on the continent. This should be implemented in partnership with statistical training centres.

44. The cartography work should be a continuous process and form part of the inter-censal activities. This will help in the smooth transition from one census to another through continuous

updating rather than re-starting the work after a gap of ten years. It is necessary to work jointly with other national cartography initiatives, such as the national spatial data infrastructure initiatives.

45. Contractual agreements about out-sourcing and management, particularly in the area of technology, have caused challenges and hindered progress, sometimes resulting in costly delays. Therefore, while outsourcing, census offices should ensure that capacity transfer is included in the contract. There is a need to learn from the good practices of other countries and draw upon expertise on procurement and the management processes available within the continent.

Technolog:

46. Census technology changes rapidly. More and more African countries are adopting new technology. When new technology is adopted, an important consideration is ensuring the integrity and continuity of existing census systems. It is recommended that national statistics offices follow a strategic approach when adopting new technology by conducting extensive pre-testing to avoid choosing very new or “immature” products. Any new technology needs to be carefully researched and tested, and cost-benefit analysis conducted before a decision is taken to use it, taking into consideration the characteristics of the country, the skills and experience of the national statistics office, and the possible partners and support of private or public institutions. South-South cooperation could be important in this regard.

47. Mobile devices allow for a more user-friendly experience than paper questionnaires by providing a well-designed interface that increases efficiency, quality and timeliness. They also reduce the cost of conducting a census in terms of printing, transportation and storage. Countries are encouraged to explore the possibility of adopting mobile technology in their next census. However, one problem is what to use the equipment for once the census is complete. Several options are already being tried out in Africa, including sharing the equipment with another country planning to adopt the technology and using the equipment internally in the national statistics office for surveys, price collection, and so on.

Quality Assurance:

48. There is a need to create comprehensive quality assurance frameworks for each component of census taking. These would include clearly laid down quality criteria and procedures for measuring, reporting and documenting.

49. Coverage and content errors should be evaluated through a post-enumeration survey, which should be planned and budgeted for as part of the main census and conducted to its end with the same vigour as the main census enumeration. The post-enumeration survey should be conducted with scientific rigour in order to obtain quality results.

50. The systematic recording of census experiences should start at the beginning of the preparatory work and continue throughout all of the subsequent phases, with a view to preparing a comprehensive administrative report. The report should describe how the census was carried out and set out the challenges, solutions and lessons learned. The cost of census should also be included in the report.

51. Although all countries conducted pilot censuses, this was in most cases limited to data collection and often took place very close to the actual census period. Pilot censuses should be conducted at least one year before the census and should cover all the phases and invariably include data processing and tabulation.

52. Special efforts should be made to engender the census process at each stage of census operations to ensure that gender biases do not creep into the results of the census.

Data dissemination and analysis:

53. Countries are encouraged to make fully edited, anonymized, public use microdata samples available on the Internet or other media for in-depth analysis by users. National capacities should also be developed for the use of such data for research purposes.

54. The tables produced from census data are mainly person-based. In order to capture the internal dynamics of households, it may be useful to produce household-based tables from the census data.

55. Countries should produce more thematic reports. One of challenges faced is the paucity of staff during the inter-censal period. One strategy could be to build partnerships with academic institutions and other stakeholders to support analysis for developing thematic reports.

56. Increased utilization of data for policymaking and implementation is one of the key strategies for advocating for more census funding. Census offices should embark on a more proactive data dissemination strategy with increased use of information and communications technology, including interactive Internet-based dissemination. In order to make dissemination effective in terms of improved data use, countries should package census data differently and use various dissemination platforms for different target users, such as policymakers, programme planners and implementers, research institutions and the private sector.

57. Census offices should harness the potential of social media, such as Facebook and Twitter, in order to raise awareness and boost dissemination.

58. Archiving of census data is an area that is often not given the attention it requires, usually resulting in dire consequences. Unedited data, semi-edited data and final data sets should be archived, along with all meta-data. It is important that new archiving technologies are utilized, including cloud storage.

Points for discussion

1. Recognizing the need to further the African regional integration agenda and harmonize statistics, the regional organizations should collaborate, coordinate and unify their efforts in strengthening the Population and Housing Censuses in the region. It is proposed to constitute a Task Force on PHC at the Regional Level with all relevant stakeholders to provide technical support and guidance to member states keeping in view the international principles and guidelines on the subject and the special requirements of the continent. The Task Force will develop a five-year programme for this purpose.

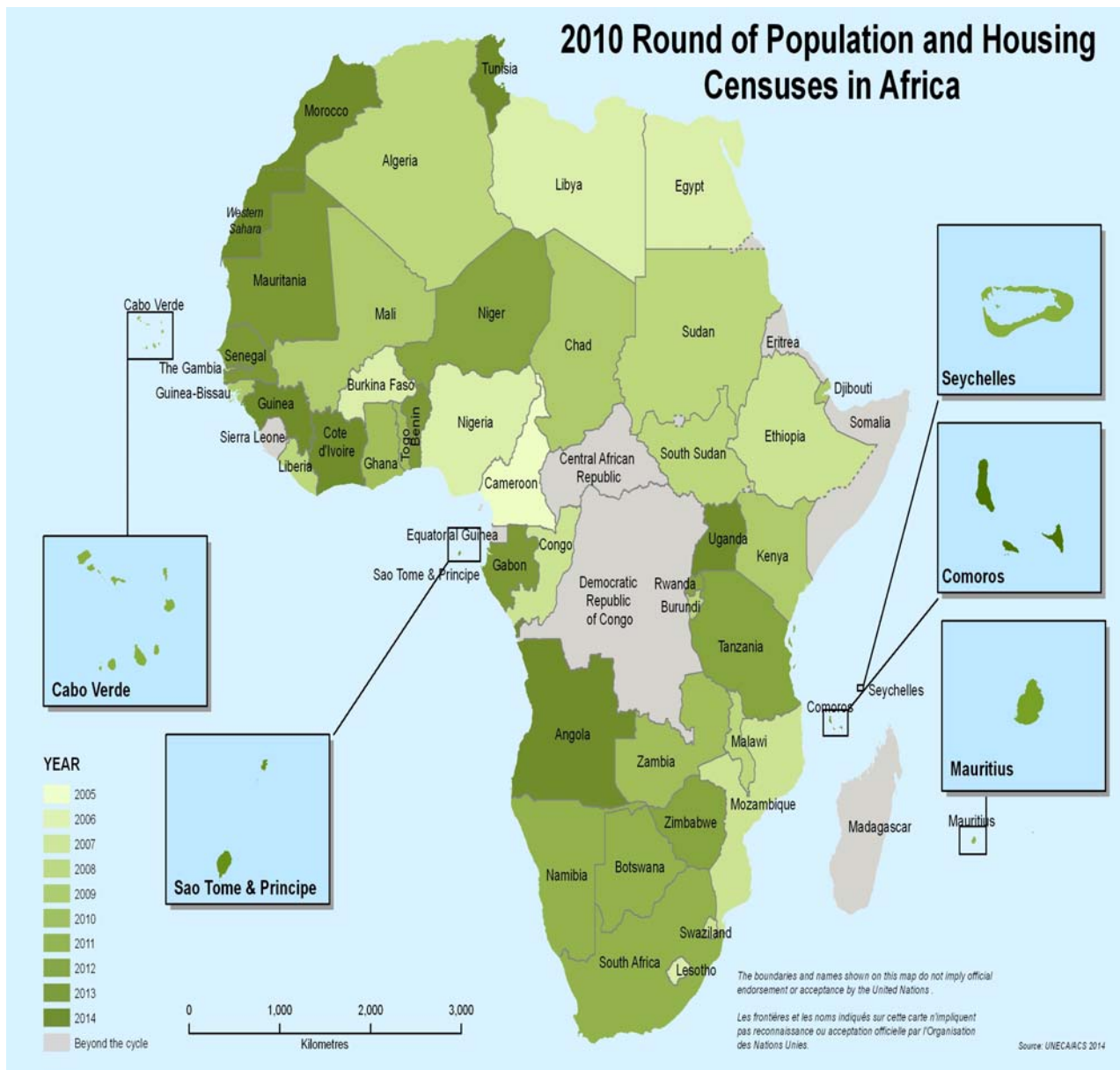
2. Develop sustainable capacity development in the region by establishing Centres of Excellence on PHCs in three African institutions, which will provide training on all aspects of PHCs including

conducting research based on census data. South-South cooperation and sharing of experiences and good practices should also be used important means of building sustainable capacities.

3. The African Symposium on Statistical Development to resume its focus on Population and Housing Census (even if in a partial way) to advocate for improved participation of African countries in 2020 Round of PHC.

4. Develop a inter-departmental working arrangement in the member states for an integrated approach in cartographic work on PHC by combining the cartographic work of Census and other national initiatives on cartography.

Annex 1: Census undertaking in Africa during the 2010 Round of PHCs



Title and theme	Date and venue	Organized by
Annex 2 African Symposiums on Statistical Development (ASSD)		
1 st ASSD: “2010 round of population and housing censuses”	30 January-2 February 2006, Cape Town, South Africa	SSA, ECA and AfDB
2 nd ASSD: “Africa counts towards a complete enumeration of the African population during the 2010 round of population and housing censuses”	15-19 January 2007, Kigali	SSA, National Institute of Statistics Rwanda (INSR), ECA and AfDB
3 rd ASSD “Best practices and exchanging experiences: 2010 round of population and housing censuses”	3-7 December 2007, Accra	SSA, Ghana Statistical Service, ECA and AfDB
4 th ASSD “Processing census data in the 2010 round of population and housing censuses”	9-13 February 2009, Luanda	SSA, Instituto Nacional de Estatística of Angola, ECA and AfDB
5 th ASSD “Information and communications technology in data dissemination: bringing suppliers and users closer in the 2010 round of population and housing censuses”	19-21 November 2009, Dakar	SSA, Agence nationale de la statistique et de la démographie of Senegal (ANS), ECA and AfDB
6 th ASSD “Data analysis and use in the 2010 round of population and housing censuses”	31 October-2 November 2010, Cairo	SSA, Egyptian Central Agency for Public Mobilization and Statistics (CAPMAS), ECA and AfDB
Annex 3 Expert group meetings and workshops		
Atelier des Nations Unies sur le programme mondial 2010 des recensements de la population et de l’habitat	6-9 November 2006, Bamako	United Nations Statistics Division (UNSD) in collaboration with ECA and the national statistics office of Mali
United Nations workshop on the 2010 world programme on population and housing censuses	30 October-2 November 2006, Maputo	UNSD in collaboration with ECA and the Instituto Nacional de Estatística of Mozambique
Expert group meeting on census planning	10-13 November 2008, Pretoria, South Africa	ECA and Statistics South Africa (SSA)
Workshop on the 2010 world programme on population and housing censuses: census evaluation and post-enumeration surveys	14-18 September 2009, Addis Ababa	UNSD and ECA
Workshop on census planning	15-17 November 2009, Dakar	ECA and SSA
Expert group meeting on census data processing, analysis and dissemination	5-7 October 2009, Pretoria, South Africa	ECA and SSA

Workshop on census data processing, analysis and dissemination	14-16 December 2009, Pretoria, South Africa	ECA and SSA
Workshop on the ISHN microdata management toolkit	12-16 December 2011, Addis Ababa	ECA and PARIS 21
Workshop on the assessment of 2010 round of population and housing census in Africa	29 April-1 May 2013, Pretoria, South Africa	ECA and SSA
Regional seminar on the promotion and utilization of census results and the revision of the United Nations Principles and Recommendations for Population and Housing Censuses	24-26 March 2014, Pretoria, South Africa	ECA and SSA