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**Statistical programme of the Economic Commission
for Africa: Statutory issues****Report on progress in population and housing
censuses****I. Introduction**

1. The present report covers a critical period between the end of the 2020 round of population and housing censuses in December 2024 and the beginning of the 2030 round in January 2025 in Africa. Population and housing censuses remain critical for providing African countries with fundamental demographic and socioeconomic information. Data derived from such censuses are crucial for planning, programming and monitoring international, regional and national commitments, such as those contained in the 2030 Agenda for Sustainable Development, Agenda 2063: The Africa We Want, and national development frameworks. Countries are supposed to undertake censuses every 5 or 10 years.
2. At its 2025 session, the Economic and Social Council endorsed the 2030 World Population and Housing Census Programme, which comprises a number of activities aimed at ensuring that Member States conduct a population and housing census during the period from 2025 to 2034, and called for fully fledged support for the Programme.

II. Achievements of the 2020 round

3. At the beginning of the 2020 round, African countries undertook to conduct at least one census during the round, pursuant to Economic and Social Council resolution 2015/10, entitled “2020 World Population and Housing Census Programme”. They also undertook to transition from manual to digital systems to ensure the use of better methods and new technologies, which would increase the reliability and accessibility of statistics in a timely manner and mitigate the adverse impacts of emergencies such as conflicts, pandemics and other exigencies.
4. During the round, the countries undertook to conduct a digital population and housing census, in line with the recommendation of the Statistical Commission for Africa at its seventh meeting that countries transition from manual to digital systems and the use of improved methods and new technologies in conducting their population and housing censuses. Forty-one of the countries were able to undertake their censuses and the remaining thirteen

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were unable for various reasons, notably budgetary constraints, the coronavirus disease (COVID-19) pandemic and conflict-related security concerns. Twenty-five countries had to postpone their censuses for various reasons, such as presidential elections, funding deficits and lockdowns related to COVID-19.

5. All the countries that undertook digital censuses did so using technology designed to increase the reliability and accessibility of census products and other statistics in a timely manner. They made continuous efforts to use alternative approaches and technologies to improve data quality and the timeliness and dissemination of census results, taking into consideration the ever-increasing costs of carrying out population censuses. During the digital censuses, mobile technology and the Internet were used to capture and transmit data to central servers. Advances in information and communications technology across the globe had changed the way routine statistical business processes, including the establishment of enumeration areas and data capture, validation, processing and dissemination were being carried out.

6. The 2020 round took place against a changing global technological landscape, leading most countries to adopt innovative approaches and strategies in every phase of the census exercise – mapping, recruitment, training, data collection, analysis, dissemination and use. Some countries still embraced the use of technology for online recruitment, training and payment, despite the Internet connectivity and coverage challenge that they faced.

III. Focus of the 2030 round

7. African countries have been lagging in innovating their census operations, leading to delayed release of census results. The Economic Commission for Africa (ECA), the United Nations Population Fund (UNFPA) and the Office for National Statistics of the United Kingdom have therefore been assisting them to transition from manual to digital systems using better methods and new technologies in an effort to increase the reliability, timeliness and accessibility of their statistics. In this respect, technology, which played a major role in the 2020 round, will continue to do so in the 2030 round, which runs from 2025 to 2034.

8. During the 2020 round, eleven countries in Africa, including the three largest, did not conduct a census. This means that several people on the continent remain uncounted, which poses a challenge for the monitoring of the Sustainable Development Goals and Agenda 2063. It is therefore critical that people in all African countries be counted in the 2030 round. Censuses have a vital role in the generation of official statistics and the provision of fundamental information for measuring the indicators of the Sustainable Development Goals. They are vital elements of national data ecosystems and the source of population denominators for the indicators. Critically, achievement of the Goals depends on the availability of fundamental data on size, growth, distribution and characteristics of populations at the local, national, regional and international levels.

9. African countries should make every effort to ensure a gradual transition from the conduct of full-field enumeration censuses to the harnessing of alternative sources of data for census purposes. At its ninth session, the Statistical Commission for Africa appealed to development partners to support African countries in leveraging the 2030 census round as a preparatory phase for transitioning to censuses based on administrative data by the 2040 round. Utilizing administrative data offers several benefits, such as generating more timely and frequent census data, reducing costs and improving data quality and coverage. However, leveraging these data sources effectively requires a strong foundation of institutional and technical readiness.

IV. Launch of the 2030 round

A. English-speaking and Portuguese-speaking countries

10. For all English-speaking and some Portuguese-speaking countries, the 2030 round was launched at a regional expert group meeting held in Pretoria from 4 to 8 August 2025 for government agencies responsible for undertaking population and housing censuses. The meeting was organized by the African Centre for Statistics of ECA, in partnership with Statistics South Africa, UNFPA, the Office for National Statistics of the United Kingdom and the Statistics Division. The aim of the meeting was to prepare census managers for the successful planning and implementation of censuses, in line with the revised international guidelines for the 2030 round of population and housing censuses. The meeting was held in hybrid format, with 105 experts participating online for sessions of their choice. Twenty-six African countries – Angola, Botswana, Burundi, Djibouti, Egypt, Eswatini, Gambia, Ghana, Kenya, Lesotho, Liberia, Libya, Malawi, Mauritius, Mozambique, Namibia, Nigeria, Senegal, Sierra Leone, Somalia, South Africa, South Sudan, Sudan, the United Republic of Tanzania, Zambia and Zimbabwe – were represented by officials from their national statistics offices or census implementing agencies and UNFPA country offices.

B. French-speaking and Portuguese-speaking countries

11. For all French-speaking and some Portuguese-speaking countries, the 2030 round was launched at a regional expert group meeting for government agencies responsible for undertaking population and housing censuses, held from 15 to 19 June 2026 in Lome. The meeting was organized by the African Centre for Statistics, in partnership with Statistics South Africa, UNFPA, the Office for National Statistics of the United Kingdom of Great Britain and Northern Ireland and the Statistics Division. The aim of the meeting was to prepare census managers for the successful planning and implementation of their censuses during the round. At the meeting, the United Nations Principles and Recommendations for Population and Housing Censuses, Revision 4, was introduced and participants were given an overview of the technical resources available as reference materials to support census activities. The meeting also served as a platform for the sharing of national experiences and practices in census activities, including related challenges and innovations. The meeting was attended by census experts from 20 countries: Algeria, Benin, Burkina Faso, Burundi, Cabo Verde, Cameroon, Central African Republic, Congo, Comoros, Côte d'Ivoire, Equatorial Guinea, Gabon, Madagascar, Mali, Mauritania, Niger, Rwanda, Sao Tome and Principe, Senegal and Togo.

V. Reference materials available for the 2030 round

12. The following materials have been developed to assist countries in undertaking high-quality and timely censuses.

A. *Guidelines for independent census monitoring in Africa*

13. The *Guidelines* constitute a comprehensive framework for effective independent census monitoring, including the scope, sampling strategies, organizational structure, identification and training of experts, and necessary tools and protocols of censuses. The *Guidelines* cover all operational phases – pre-enumeration, enumeration and post-enumeration – through structured observation, representative sampling and robust reporting mechanisms. They also contain information about best practices for team composition, training,

customized monitoring, ethical standards and systematic reporting, to ensure transparency, data quality and credibility throughout the census process. They will also enable countries to uphold international standards and foster trust among stakeholders. Also outlined in the *Guidelines* are various aspects of the independent census monitoring and evaluation process, including operational procedures ranging from administrative and logistical arrangements to planning, financial resources and rules and regulations, and examples of the use of independent monitoring in three countries, which can be adapted for use in other countries.

B. *Digital Population and Housing Census Handbook (e-Census Handbook)*

14. The *e-Census Handbook* is a repository of experiences, key lessons learned and good practices in the planning and implementation of digital censuses in Africa during the 2020 round of population and housing censuses. It enables national statistics offices and other partners to learn about experiences from across Africa and to apply them in their census planning and design context.

15. The *Handbook* is aimed at census officials supporting implementation of digital population and housing censuses in Africa, including census officials in national statistics offices, pan-African agencies and other institutions supporting implementation of population and housing censuses in Africa.

16. More specifically, the *e-Census Handbook*:

(a) Presents experiences and lessons learned in the implementation of preparatory activities for a digital population and housing census in Africa.

(b) Presents experiences in the acquisition and use of electronic devices in digital population and housing censuses;

(c) Provides information about the main lessons learned from and issues surrounding the use of electronic devices and other technologies (e.g. for e-recruitment) and how that use affects the census business process model;

(d) Highlights areas of expertise of various countries in which their experts could be called upon to provide technical assistance to other countries in their census development processes;

(e) Provides guidance for the planning of the 2030 round by identifying key areas where work is required to support the planning and implementation of censuses in Africa.

C. Report on country preparedness for the 2030 round

17. The African Centre for Statistics undertook a systematic assessment across all African countries to map out their operational readiness and address capacity deficits early. The assessment was based on a comprehensive survey conducted by ECA using a structured readiness questionnaire, with responses received from 38 national statistics offices, which helped to establish a solid diagnostic baseline for future support. It showed that almost three quarters of the countries have established their census dates and 22 countries have reported that at least 50 per cent of their funding comes from the Government, representing between 90 and 100 per cent of total funding in more than one third of the countries. The funding landscape for censuses in Africa shows high national ownership and heavy dependence on public domestic finance, while private sector and multilateral contributions remain largely untapped.

D. *Principles and Recommendations for Population and Housing Censuses, Revision 4*

18. To prepare for the 2030 round, the United Nations Statistics Division has issued its *Principles and Recommendations for Population and Housing Censuses, Revision 4*. The participation of ECA and African countries in that exercise was critical for the African perspective to be taken into consideration. The revision updates the previous version of the Principles and Recommendations to reflect current best practices in census planning, organization, conduct and utilization. It addresses areas such as the use of administrative data, geospatial integration, contingency planning and quality assurance. At its fifty-sixth session, the United Nations Statistical Commission endorsed the fourth revision of the Principles and Recommendations, in which it emphasized the importance of censuses for achieving development goals and promoted modern practices, including georeferencing and the use of administrative data. It also stressed quality standards and timely data dissemination. The fourth revision provides global guidance for the planning and conduct of national population and housing censuses for the 2030 round, taking into consideration different regional contexts and the diversity of statistical capacity across nations.

E. Digital assets available for the 2030 round

19. The following digital assets have been developed by the African Centre for Statistics and will be available for countries to use in the 2030 round:

(a) Census management checklist: This checklist has been developed to facilitate the management and monitoring of implementation of each census phase and to provide guidance on the timing and scheduling of activities and tasks when conducting a digital census in Africa. This tool for successful census project management is intended for use by national census implementing agencies in combination with the *Principles and Recommendations for Population and Housing Censuses* and the *United Nations Handbook on the Management of Population and Housing Censuses*;

(b) Tablet provisioning: Countries will be supported in the automation of their processes with the installation of specific census software on tablets. This will help to reduce the scope for human error and save the time and human resources required for manual processes. Countries will receive assistance with planning their workflows, resource requirements and tablet specifications. They will also receive open-source software and guidance on how to configure the software to their local conditions, and assistance and guidance with testing and initiation of tablet provisioning procedures;

(c) Census monitoring dashboard: Countries will receive support in identifying and developing country-specific indicators for their census monitoring dashboard; setting of expected values and tolerance levels for each indicator; testing and installation of the dashboard locally for use in the census. Countries will be supported in the development of business processes for using the dashboard during the census, including the training of users of the dashboard; definition of mitigation actions for different scenarios; and establishment of structures and terms of reference for regular operational meetings. A dashboard with similar features will be developed for post-enumeration surveys;

(d) Help desk: Countries will receive assistance with the customization and implementation of a help desk application, including the gathering of information to identify local requirements for the application; customization of the back end of the application to reflect local requirements and processes; installation of the back end; training of users on the use of the

application; and troubleshooting;

(e) Observation of census operations: In-country technical assistance will be provided for the observation of the census dashboard to identify digital or quality issues and resolve them in real time, make changes to the dashboard to reflect emerging requirements, and identify potential enumeration issues and address them immediately or during data processing;

(f) Census dissemination and communication toolkit: Countries will be supported in the automation of some of their census-related analytical processes and in communication and use of their census products;

(g) Tablet reconfiguration: As tablets need to be reconfigured to factory settings after a census so that they can be disposed of or reused locally for other activities or for censuses in other countries, support will be provided on several fronts, including guidance on planning workflows and resource requirements for resetting the tablets; supply of applications to enable reconfiguration and resetting of the tablets; guidance with configuring the software to suit local country conditions; assistance with testing and initiation of cleaning and reset procedures; and guidance and advice on issues that need to be addressed when tablets are to be shared with other countries.

VI. African Committee on Census Coordination

20. Different multilateral and bilateral donors will be providing support for the successful implementation of population and housing censuses across Africa for the 2030 round. In the past, there had often been insufficient regional or country-specific communication and coordination among the organizations involved, resulting in incoherent support, major funding gaps or duplicative funding of specific tasks. That had indirectly encouraged countries to postpone critical census decisions and activities while they waited for a more suitable assistance package. It had also led to over-scheduling of scarce host-country resources to service multiple near-simultaneous data collection efforts, resulting in poorly sequenced activities, lost institutionalization opportunities and collection of data of compromised quality. These issues have become more severe with the increasing scarcity of financial resources in support of population and housing census activities.

21. The African Committee on Census Coordination was set up jointly by UNFPA, ECA, the World Bank, the African Development Bank, the African Union Commission, the United States Census Bureau and the Office for National Statistics of the United Kingdom, in response to the call by the Economic and Social Council, in its resolution 2015/10 on the 2020 World Population and Housing Census Programme for “coordination of activities among stakeholders in assisting Member States in the implementation of the Programme”. The Committee was established after the inception of the 2030 census round in January 2025 in Africa.

22. For that round, most countries will conduct a census similar in design to the one conducted in the 2020 round, but in the context of increased pressure on resources and potentially increasing security concerns. These are also the pressures under which the Committee will operate.

23. The Committee aims:

(a) To increase the proportion of countries undertaking a census in the 2030 round;

(b) To strengthen the ability of countries to engage with users and build on that engagement to improve the use of and access to census data – extracting more value out of the data than in previous census rounds;

(c) To ensure that countries are actively thinking about how census processes can be used and replicated in other data collection exercises, and vice versa;

(d) To ensure that cost and quality are vital considerations when censuses are being designed and planned, and work to develop new or refined approaches to existing technology-based processes or examine cost and quality in a more transparent manner;

(e) To consider the designs for the 2040 census round and aim to strengthen capacity and planning in countries that have started establishing new data sources, methods and processes for that round, including the use of administrative data wherever possible in the 2030 round.

VII. Supporting tablet lending and sharing

24. ECA has in the past devised a scheme to help countries that cannot afford tablets to have access to them. The scheme had two components. The first was a South-South cooperation tablet-sharing initiative, which was launched by President Uhuru Kenyatta and has been hailed as an exemplary show of South-South cooperation. Speaking at the launch, he said that the initiative was “a rare fusion of Pan-Africanism and the information age”. Under the scheme, tablets were shared between Kenya and several countries, including the Gambia, Malawi, Mauritius, Senegal and Zambia. The second component was the tablet bank, through which resources mobilized by the management of ECA, through the United Nations Controller, were used to purchase 22,500 tablets that were offered to countries on a rotational basis. Angola, Namibia and Togo were able to use the scheme for their censuses. In addition, since tablets were in short supply following COVID-19, the African Centre for Statistics assisted countries in purchasing tablets from credible suppliers in China and the United Arab Emirates by negotiating with those suppliers to receive preferential treatment because of the importance of censuses to Africa. Variants of that model will be used again in the 2030 round so that countries can access tablet devices.

VIII. Foundation for transitioning to censuses based on administrative data

25. The following actions should be undertaken to lay the foundation for censuses based on administrative data:

(a) Establishing and maintaining the requisites for legal and ethical issues: A successful transition to combined censuses or censuses based on administrative data requires a legal framework for the use of personal data from registers for statistical purposes; institutional infrastructure and capacity; continuous and effective collaboration with stakeholders, especially register holders; and building of public trust in the confidentiality of personal data. Entities should ensure compliance with national data privacy regulations and obtain the necessary approvals for sharing data across agencies, as required;

(b) Identifying and assessing administrative data and other sources: This phase requires extensive planning and management in collaboration with register holders and data users. National statistics offices should identify and assess existing registers early in the planning process; evaluate the quality of each data source and its relevance for producing census information; and coverage and consistency across registers; and determine which sources (base and specialized registers) will be used for the census, together with any other data sources (e.g. full-field enumeration, ad hoc surveys) that will be used to improve the quality of existing registers or to collect information for missing

variables not included in registers. The phase also involves analysing concepts and definitions of population-related variables in the sources of administrative data, comparing those definitions with those that generally apply in full-field enumeration censuses, and deciding whether or not any differences are acceptable, while balancing cost, timeliness of delivery and data-user needs;

(c) Transforming administrative data into statistical registers (data linkage development): The process of converting administrative data into statistical registers is fundamental for producing census-like outputs. This transformation involves a series of context-specific activities, depending on the strength of a country's existing population registers and other sources of administrative data. Countries with well-established population registers can more efficiently develop statistical population registers. However, those with less reliable data may require some full-scale enumerations or ad hoc surveys. The core activities in this transformation typically include developing statistical population registers; constructing integrated statistical registers by linking different registers, assessing data quality and improving the accuracy of the integrated statistical registers; and performing data processing tasks such as detecting and resolving duplicate records, updating administrative records (e.g. using "signs of life" techniques), resolving inconsistencies between administrative records, and applying editing and imputation methods to enhance data reliability;

(d) Assessing and managing quality: Quality management and assessment are integral processes that national statistics offices implement throughout all phases of this transition. To ensure a successful transition, it is essential to establish a system for continuous monitoring and evaluation of quality at each stage. This enables a better understanding of how quality at one phase impacts subsequent phases and, ultimately, the final census outputs. The quality management framework should encompass four vital elements: quality of data sources, quality of input data, quality of processes, and quality of outputs. By systematically assessing these elements, national statistics offices can enhance the overall reliability and accuracy of the census.

IX. Technical assistance to be provided by the African Centre for Statistics

26. The African Centre for Statistics has established a niche in digital censuses and has become the point of reference and a reliable partner for national statistics offices across Africa.

A. Development of census project documents

27. ECA has been supporting countries in the preparation of census project documents, which are intended to provide a definition of a census and spell out processes and procedures for the conduct of censuses, with a breakdown of activities by different components of the census cycle and the total estimated budget broken down by major components or milestones.

28. ECA will be supporting African countries in implementing technologically driven censuses. To facilitate the use of technology in census processes, it has been developing tailor-made computer applications specific to the needs of each country. Based on the successful implementation of these applications in the 2020 round, requests for assistance for the 2030 round have increased substantially and the Commission is committed to fulfilling them.

B. Post-enumeration surveys

29. The Commission has been supporting countries in undertaking post-enumeration surveys to enable them to ensure statistical robustness and produce quality census outputs, not just for the census results, but for ongoing use in population projections.

C. Geospatial information systems

30. The mapping and demarcation of enumeration areas are critical for the successful coverage of a census. The Commission has been supporting countries in mapping and demarcation as well as in spatial analysis of census results, which play a crucial role in ensuring accurate and comprehensive census enumeration and analysis. Geographic information systems offer a powerful toolset for that specific purpose. By utilizing such systems, census authorities can better plan and delineate enumeration areas, ensuring that no region is missed or counted twice. The systems allow for the analysis and visualization of spatial data, enabling census organizers to identify suitable boundaries, optimize enumeration routes, and allocate resources efficiently. Through the integration of geographic information systems into census operations, authorities can enhance the accuracy, coverage and completeness of their enumeration exercises, ultimately leading to a more robust and reliable census dataset for spatial and other analyses and dissemination of census results.

D. Capacity-building for census staff

31. Staff from national statistics offices will be trained in the use of new technologies, including applications developed by ECA, for census operations, including mapping.

X. Recommendations

32. In the light of the above considerations, it is recommended that the Statistical Commission for Africa:

- (a) Encourage countries to undertake digital censuses during the 2030 round;
- (b) Encourage countries to continue to adopt innovative approaches and strategies at every phase of a census, from mapping, recruitment and training to data collection, analysis, dissemination and use. Innovative approaches, such as hybrid censuses, need to be considered for conflict zones that cannot be reached by enumerators owing to safety issues. Carefully planned, mixed census methods involving a combination of traditional and Internet-based data collection and registry-based censuses can be adopted;
- (c) Urge countries to embrace the benefits of independent census monitoring for all phases of the census undertaking at the earliest stage of planning and commit adequate resources to it. Adopt guidelines on independent census monitoring for use in Africa with the aim of promoting adherence to international standards and contemporary census practices, while also serving as a regional mechanism for the standardization of census operations across the continent;
- (d) Request that the African Committee on Census Coordination:
 - (i) Draft a checklist for testing digital data collection systems in census operations;

- (ii) Develop a comprehensive generic quality assurance framework across all census processes that is adaptable and scalable for census managers to be able to customize and use it for their censuses;
- (iii) Develop a generic administrative risk management tool for census operations, with a view to providing national statistics offices in Africa with a dynamic tool for identifying, assessing and mitigating potential risks;
- (iv) Develop a joint one-stop portal for all technical resources for censuses, including questionnaires;
- (e) Encourage census officers in all countries to ask people for their date of birth (in addition to age) during enumeration, in recognition of the importance of that variable for linking census data with other sources;
- (f) Encourage countries to set up a committee to review census topics specific to Africa; reach out to the focal persons at ECA, the Statistics Division, UNFPA and the Office for National Statistics of the United Kingdom for support in reviewing census questions; and use one standard short- or long-form household questionnaire for their censuses, given the complexity of having to administer both types of questionnaire;
- (g) Recommend that countries strengthen their data use culture to ensure that selected topics are translated into policy, while embracing the production of policy briefs and inclusion of data on the strategic impacts or implications of census findings in statistics reports;
- (h) Request ECA and UNFPA to finalize the compilation of the per capita costs of the 2020 census round for all countries to inform resource mobilization efforts for the 2030 round;
- (i) Request that better training on the use of field monitoring dashboards be provided to enable operators to understand not just the technical features of the dashboards, but also the information generated by the dashboards and how to respond in specific scenarios, such as when faced with a low response rate. The use of indicators should be reviewed and the dashboards streamlined or simplified to ensure that they include only indicators that a national statistics office would be able to actively address during field enumeration;
- (j) Recommend that artificial intelligence and machine learning tools and other cutting-edge technologies be leveraged to track progress in enumeration exercises and respond instantly to anomalies;
- (k) Request UNFPA, ECA and other census partners to negotiate with donors to have one basket funding and management mechanism for census operations. Countries should secure financial support to procure relevant technological infrastructure for innovative census solutions;
- (l) Request intergovernmental organizations, UNFPA and ECA to support coordination and provide technical assistance to countries; provide support through South-South cooperation to encourage the sharing of knowledge and resources, especially on mixed-mode data collection and digital innovations; promote cross-border mechanisms for sharing equipment and reducing duplication of costly investments; and leverage strategic platforms to advocate and secure the necessary resources for the development of an African census programme;
- (m) Encourage countries to strengthen links between population-related data systems and other administrative data systems, and develop resources to support assessments of census coverage and quality, given the need to determine why current population enumeration exercises fail to comprehensively capture international migration;

(n) Urge countries and development partners to collaborate and maximize the technical support provided for the development of population registers, including through the Africa Programme on Accelerated Improvement for Civil Registration and Vital Statistics, given the recognition that the increasing number of national identification systems offers a significant opportunity for the advancement of such registers;

(o) Acknowledge the need to overcome the low usage of sources of administrative data for statistical purposes and advise countries on when to complete the self-assessment tool on readiness to use administrative data for census.

XI. Conclusion

33. There is a pressing need for countries to be empowered to adopt international standards and innovative approaches to reduce costs and enhance data quality. Countries should therefore explore innovative ways to reposition their census operations within the broader data ecosystem. The innovative approaches and cost-saving suggestions proposed include:

(a) Cartographic mapping: This involves the use of other data sources to reduce the amount of fieldwork required during mapping, while prioritizing areas of greatest change and adopting geospatial artificial intelligence. It also involves the adoption of cost-effective and less resource-intensive hybrid approaches to enumeration area mapping, such as using building footprints from open-source satellite imagery and the pre-census enumeration area tool validated by a sample of field-based census listings; the use of enumeration area demarcation tools so that most of the mapping work is performed in-office, with field visits limited to verification exercises only, where necessary;

(b) Multimodal data collection: This involves integrating computer-assisted telephone interviewing and computer-assisted web interviewing with the current computer-assisted personal interviewing and paper-and-pencil interviewing method in areas that are hard to reach to improve accessibility and data quality and reliability. It would be advisable for countries that are considering the use of computer-assisted web interviewing in their next censuses to use it in a blended multimodal set-up, rather than as a stand-alone option;

(c) Dashboard monitoring: This involves reducing external dependency by developing and maintaining real-time monitoring dashboards with advanced features;

(d) Training and e-recruitment: This involves the integration of online recruitment platforms with census management systems, adoption and increased use of videos and other e-learning tools during training to reduce the amount of face-to-face training, and automation of recruitment processes;

(e) Data analysis and report writing: This involves the use of artificial intelligence and machine learning tools in census data editing and coding to improve data quality, analysis, visualization and report writing;

(f) Adoption of alternative methods: When census results cannot be physically validated, alternative mechanisms can be used, such as artificial intelligence-facilitated validation, digital footprints of geographic information systems and satellite imaging, to generate population estimates in hard-to-reach areas. Other proposals include integration of geospatial data with sociodemographic census and survey data to model population estimates for each enumeration area; use of a “hybrid census” approach, involving a combination of imagery and statistical modelling for population estimates in inaccessible areas; and use of administrative data for determining model estimates of the population.

34. States have highlighted the following areas where technical support would be needed for the 2030 round:

(a) Capacity-building on the transformation of real-time census monitoring dashboards for use in surveys after the census is completed;

(b) Availability of technical specialists in the use of biometrics for census enumeration;

(c) Technical training on digital systems and the use of data collection techniques such as computer-assisted personal interviewing, computer-assisted telephone interviewing and computer-assisted web interviewing, and on the use of administrative registers;

(d) Capacity-building on the use of the CSPro census and survey processing system for customization and quality assurance; artificial intelligence and machine learning; conversion of maps and other geospatial data to MBTiles format; data integration; and use of information technology systems that are critical for modern census operations.
