# 10. Census Analysis, Products, Dissemination and Archiving

## 10.1 Introduction

Following the management and processing of census data, analysis, developing census products, their dissemination and archiving is inherent.

*“A census is not complete until the information collected is made available to users in a form suited to their needs.” United Nations Statistics Division (2017), Principles and Recommendations for Population and Housing Censuses -Revision 3, pp 124; para. 3.240.*

This chapter focuses on census data analysis, developing census products, their communication, dissemination and archiving.

Census data is massive and can generate a wide range of statistical products. The development of census dissemination products is a process typically led by the NSO and production of census products is part of the census process. Some of the products include: published tabulations based on preliminary or final census results; Specialized or customized products requested by users such as tables from the NSO database or self-generated by users; General interest or special-interest group products; Thematic statistical or analytical reports; Methodological reports; Administrative reports; Census geographical reports including codes and classifications; Databases, including microdata and table-oriented databases; Metadata and Post Enumeration Survey Report; and special audience products which may include: policy briefs, summary reports, thematic and analytical reports, key findings reports, fact sheets, posters, brochures and flyers, basic reports, detailed tables and spreadsheets, articles, video and social media products.

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Communication of the census results to the various stakeholders in the right format and time is key. In the 2020 round several dissemination platforms were used by countries such as social media via Facebook, LinkedIn, Twitter etc; interactive databases; open access free download facility; geography products like map books, ATLAS; interactive maps like web feature service and web map service; E-Government; mobile phone technology (SMS). Other dissemination channels that can be considered include:

**Newspaper** - print and online publications, straight news articles, editorials, opinion pieces, or lifestyle features, can cover issues in depth including graphs, charts etc.

* **Press releases** - designed to provide information to the media about a data release or a new data product.
* **Television and radio** - coverage of news, current affairs, talk shows, or as part of regular programming, can be live coverage or pre-recorded, wide reach, can be in local language, Radio has the advantage of low cost.
* **Web dissemination** - the internet facilitates faster and wider dissemination of census data at relatively low cost, Online platforms-website of NSO, social media, blogs, The NSO web page and electronic data products should maintain the same look and feel as other dissemination materials. All printed census products should also be available on the NSO website to ensure standardized outputs.
* **Online data access**- can be either static or interactive platforms like Census-Info visualization.
* **Other dissemination approaches** – such as public dissemination/launch events –invite NSO leadership (including local level), government leaders (including local governments), community leaders, other key stakeholders. Publications, Excel Tables, Other electronic products like USBs, DVDs which include publications. Dissemination workshops/ training at national and sub-national levels. Workshops on thematic areas (e.g., disability, labor force, gender, etc.)

Other Population dissemination platforms include:

* **IPUMS**-which provides census and survey data from around the world integrated across time and space. Its integration and documentation make it easy to study change, conduct comparative research, merge information across data types, and analyze individuals within family and community contexts. The data and services are available free of charge. The application was developed by the University of Minnesota.
* **REDATAM** (Retrieval of DATa for small Areas by Microcomputer) -for files of micro-data and user-defined outputs**.**  It is Statistical software for microdata processing of population and household censuses, surveys, and vital statistics. It was developed by the CELADE Population and Development Division of ECLAC United Nations. It is distributed free of charge. It has elements that make it a powerful tool, for instance it allows the processing, analysis, and dissemination of data.
* **National Portals-** Various portals are also developed ant National Level for dissemination of census products. For instance, Esri has been engaged with UNFPA on the Population Data Platform (PDP), Covid Hub and overall use of GIS to expand and support UNFPA mission. Additionally, Esri has also been engaged in working directly with countries aiding in the work of integration of statistical and geospatial information and modernization with GIS.
* **Data for Action: Population Data Portal:** it includes a geospatial dimension with highest quality GIS attributes. It combines population data with development indicators to map and Leave No One Behind (LNOB). It also combines population data with service locations to evaluate coverage of service delivery.

After implementation of all census processes, several items are archived for future reference and use. These include archiving of non-statistical data, statistical data, and various materials. Statistical data to be archived includes individual records. The goal of implementing good archiving practices is to keep individual census records safe and available for future use by the government, researchers, and the various census stakeholders.

In this chapter we discuss data analysis, developing census products, their dissemination and archiving in a digital census.

### 10.1.1 Comparison of analysis, products, dissemination and archiving in the non-digital versus digital census era

The move away from paper-based methods has introduced a paradigm shift in how census data is processed, analyzed, and disseminated. This has paved the way for more timely and comprehensive insights into population dynamics. The transition to digital censuses across Africa is revolutionizing not just data collection, but also the depth, speed, and scope of data analysis.

With digital census, geospatial and related products are now possible since GPS coordinates for the households are picked. It is possible to estimate proximity of essential services to the population among other geospatial analysis.

Technology and digital gadgets get obsolete at a higher rate compared to paper which may result in loss of census information sooner than expected. Therefore, in a digital census both electronic and non-electronic materials require to be archived.

### 10.1.2 Considerations for data analysis, products, dissemination and archiving in a digital census

Analyzing population census data is a high stakes endeavor especially when accuracy, policy relevance, and public trust are on the line. Some key considerations to guide a robust and insightful analysis include:

* Data quality assessment for coverage errors to identify undercounts or overcounts and content errors to evaluate inconsistencies or misreporting in key variables such as age, sex, or occupation. Check for demographic consistency.
* Ethical and legal considerations to uphold data privacy and confidentiality standards, in data disaggregation by sensitive characteristics, and ensure compliance with national and international statistical standards.
* A detailed tabulation plan and desired report structure. Detailed guidance on tabulation, see the UN P&R rev 4 para 3.297 to 3.301.

Census products should be developed based on an agreed communication and publicity plan which clearly defines the audience based on various stakeholder groups. Stakeholder segmentation improves understanding and utilization as they respond to their needs. See LINK to section on publicity. The following considerations should be made when developing census products:

* Before producing census dissemination products, NSOs must identify what products are appropriate and need to be generated to meet the stakeholder needs. This is determined through stakeholder engagements at the [planning stage](#_2.1￼Development_of_the).
* Census dissemination products should be developed and tailored for various stakeholder groups as stakeholder segmentation improves understanding and utilization of the developed products.
* Partnership with national / international stakeholders is a common practice in the production of census products. There are various operational modalities for producing census products. There is no one-size-fits-all approach.
* When developing census products, the following checklist should be taken into consideration:
  + **Functionality** – it does what users need it to do.
  + **Usability** – is easy for people to access and use.
  + **Reusable –** design is reusable, people can reuse the product.
  + **Helpful features** – should solve users’ problems.
  + **Findable** – clear product name or title, matches what users will use as search terms online;
  + **Look and feel** – no clutter, consistent language, and looks professional.

The following considerations should be made for effective dissemination:

* It is a pre requisite to develop a census dissemination strategic document that should include: (1) products to be developed, (2) the media of dissemination, (3) metadata to aid in the interpretation of the results, (4) confidentiality and privacy measures, (5 ) assessment of the required technologies to meet user needs, (6) dissemination policy, (7) quality assurance in terms of accuracy and timeliness, (8) required financial and human resources.
* Prioritize digital visualization of the census data because it helps to give a fast overview or summary of a dataset; it communicates memorable and important stories in a dataset; it reveals insights that would otherwise be hidden. Use dashboards, infographics among other digital tools.
* It is desirable to use simple, non-technical language, clear and concise headings and sub-headings, short sentences of no more than 25 words, compact paragraphs of no more than four sentences, bullet points to make text easier to read, frontloaded text with the most important information first and charts where appropriate to illustrate text.
* The choice of topics for dissemination and their detail depends on the census questionnaire content. Consultations with users are important when determining the questionnaire design. See LINK to section on enumeration tools. The consultations should include planned tabulations and other outputs and the development of the census database. Census topics should meet the requirements of users, considering cost-effectiveness, human resources, time availability and respondent burden. For detailed guidance on dissemination, see the UN P&R rev 4 para 3.310 to 3.334.

The following considerations should be made for efficient archiving of a digital census:

* Detailed guidance on the process of archiving individual census records should be included in the census legislation and should be in accordance with the country’s laws on archiving official government documents and information. These provisions provide the legal basis for maintaining the archives and procedures related to the release of official government records archived.
* A clear archiving strategy should be put in place to guide the process. The archiving plan should ensure that the process prolongs the usable life of archived records by preventing the loss of informational content.
* Census offices should determine the materials and products to archive in time and put plans in place for the archiving process.
* In the case of digital records, the accompanying documentation is an indispensable part of the archiving process because several variables in the digital record are presented as codes. It is necessary to archive all the codebooks and all the other documentation, such as the data collection instrument, that are needed for fully unlocking the value of each of the variables in the record. Ensure systematic cataloguing and dissemination.
* The duration of the retention of various documents should be well thought out in time. The archiving period should be specified for all digital data, supporting software or algorithms, and documentation to ensure that a service can be offered to users in the future.
* The records should be stored using media with long-term stability and access to these media is carefully controlled.
* Before archiving individual records, care must be taken to ensure confidentiality and privacy of the respondents through anonymization. Detailed guidance on archiving individual records, see the UN P&R rev 4 para 3.581 to 3.585.
* NSOs should put in place proper technological infrastructure for the various components of microdata archiving including the IT culture and facilities of the country and the census agency.
* Additionally, the organizational policies should be considered such as:
* Storage management policies for both paper and digital records.
* Management access control policy to maintain confidentiality through format and documentation standards.
* Emergency preparedness policies to limit damage from natural disasters or other emergencies.
* Disaster recovery policies provide mechanisms for duplicating digital content and storing it in separate physical facilities (with regular back-ups).
* Security policies to prevent accidental or malicious loss.

For detailed guidance on archiving, see the UN P&R rev 4 para 3.581 to 3.594.

## 10.2 Selected country experiences

**Kenya** produced a wide range of census products from the 2019 Kenya Population and Housing Census (KPHC), including preliminary and basic volumes, thematic and analytical reports, and various visual and digital outputs like posters, brochures, and a census atlas. Thematic reports covered topics such as fertility, mortality, migration, urbanization, gender, disability, youth, education, housing, ICT, and more. The process involved a technical team, tabulation plans, data consistency checks, and stakeholder validation. Dissemination was guided by a policy and included public launches, media forums, digital platforms, and engagement with stakeholders, though resource limitations affected outreach to lower administrative levels.

**Ghana** released several volumes from its 2021 Population and Housing Census, starting with a preliminary report and followed by thematic and analytical reports, a census atlas, and plans for interactive dashboards and infographics. Dissemination strategies emphasized sustained engagement, user-friendly presentation, and capacity building. Activities included stakeholder interviews, media engagement, webinars, and educational programs. Ghana also planned initiatives like a statistics-for-schools program and an annual census awareness day to maintain public interest and promote data use.

**Malawi** conducted its digital census in 2018 and produced a variety of print and digital products, including district and thematic reports, media briefs, and infographics. The Malawi Data Dissemination Platform (MDDP) played a key role in making data accessible and interactive. The dissemination plan was integrated into a broader communication strategy, using mass communication, interpersonal engagement, and partnerships. Challenges included unplanned costs for communication experts. Malawi also developed monitoring, evaluation, and crisis recovery plans to support the census process.

**Mozambique** produced a range of outputs from its 2017 census, including preliminary and final reports, brochures, projections, shapefiles, and child-friendly materials like comics. Dissemination was tailored to different user groups, such as students, NGOs, media, and people with disabilities. The approach emphasized inclusive communication and partnerships, including a media association and WhatsApp groups. The use of consultants for thematic studies posed challenges, but media engagement significantly increased public interest and data usage.

**Eswatini** faced delays in producing thematic reports due to staffing shortages, despite support from UNFPA. The 2017 census outputs included thematic reports and population projections, disseminated through stakeholder workshops and digital formats. Subject specialists from various sectors contributed to the reports. The country has maintained a 10-year census cycle since 1956, with efforts to ensure timely and accessible dissemination through both print and electronic means.

**Tanzania** launched its initial 2022 census results 45 days after enumeration, accompanied by a National Guideline for Utilization of Census Results. Dissemination used traditional and digital media, mobile apps, and public events. Reports were developed collaboratively by government staff, academics, and interns. Plans included contracting university experts for monographs and building staff capacity. The strategy aimed to ensure broad access and use of census data for planning and development.

**Egypt** published its 2017 census results via a platform on the CAPMAS website, including a geoportal for GIS data. Dissemination tools included hard and soft copies, press releases, and workshops. CAPMAS prioritized electronic publication of preliminary results and used Google Analytics to monitor user engagement. The agency maintained a schedule of publications and emphasized timely data updates.

**Zimbabwe** released eight preliminary reports from its 2022 census to support budget planning and constituency delimitation. Dissemination included hybrid workshops, cabinet presentations, social media, and media interviews in local languages. Products included national and provincial reports, thematic reports, and a census atlas. Future dissemination plans involve posters, seminars, and integration into REDATAM for user-generated analysis. Partnerships with media aim to enhance public understanding and access to census data.

Link to case studies section

**Kenya**

Several products were to be generated from 2019 KPHC meeting different user needs. They included: Preliminary report (Volume I); Basic volumes (Volume I-IV); Census data bases; Cartographic maps; Geodatabase that includes EAs-development of HH master sample frames; Census Thematic Maps (Population Atlas), Analytical/thematic reports (which are based on studies of demographic, social and economic topics, government priority as well as some methodological issues), Posters, Leaflets, Wall Charts and Brochures.

The first set of the four Basic census results were released within six months after the enumeration: Volume I: Distribution of the enumerated population by size, sex, number of households and average household size, at national, county and sub-county levels within 2 months - November, 2019; Volume II: Distribution of Population by Administrative units (up to Sub-Locational level-lowest administrative unit); Volume III: Distribution of Population by Age, Sex and County; and Volume IV: Distribution of Population by Socio-Economic Characteristics.

Analytical Reports (Monographs) that were launched two years after enumeration (included: Fertility and Nuptiality: Levels, trends, and differentials in Fertility and Nuptiality; Mortality and Health : Levels, trends and patterns in mortality and health; Migration: Levels, trends and patterns in internal and international migration; Urbanization: Levels, trends and patterns of urbanization with a view of providing useful data for formulating appropriate and sustainable policies on urbanization; Household and Family Dynamics; Gender Dimension: provides gender differentials/gaps in various indicators; Disability: Levels and differentials in disability status; Youths and Adolescents: demographic profiles, education levels, fertility levels, employment status, disability, and ICT usage concerning the youth and adolescents; The older and vulnerable population: situation of vulnerable segments of population in Kenya (the elderly-age 60+; orphans; working children (5 - 17); children in child headed household (HH <18 years; persons who declared themselves as intersex etc.); Education and Training: School attendance status, education enrolment and attainment, training acquired and qualified for; Housing conditions, amenities and household assets; ICT: use and ownership of ICT equipment;.

Others that were launched included: Population Projections: Projections for 2020 – 2045, Labour Force Dynamics: Economic characteristics of the population; Agriculture; Population Dynamics; Census Atlas; Geo-Spatial Dissemination System; 2019 KPHC Popular Report; Administrative Report.

The process of producing the 2019 census products started with identification of a technical team drawn from the KPHC Technical Working Committee and those with experience from the 2009 census to lead the process.

A concept note to undertake the development of outputs was developed and the required technical assistance was sourced from universities and MDAs, while the financial support was obtained from various development partners. During implementation of the process, mapping of the users and key stakeholders by thematic area/sector and formation of teams by thematic areas; Identifying the key indicators by thematic area taking into consideration both international, regional and national indicators; Development of tabulation plans per thematic area and report formats which were presented to the TWC for discussion and approval; and the team took lead in all the phases of production of census products.

During development of the census products, the following steps were followed:

1) Development of tabulation plans for various indicators;

2) Generation of tables for the various indicators;

3) Undertaking consistence checks based on the outputs from various tables;

4) Review of the data edit specifications to address any noted inconsistencies;

5) Generation of final tables from cleaned data set;

6) Report writing and peer review of the reports;

7) Editing and formatting of the reports;

8) Validation of the reports through engagement of various stakeholders;

9) Printing of the final report;

10) Launch of the reports.

In Kenya, dissemination involved packaging, distributing, and making available census results in the most effective manner, as well as encouraging wide usage of the data. Data dissemination processes were guided by the dissemination policy which addressed the principles, conditions, technical aspects, and the way KNBS disseminates statistics to users for research and other purposes.

The Dissemination process utilized included: Public launch of the census results; Publishing basic reports and monographs from the census data; Organizing media forums to share the results; Holding National and County dissemination workshops; Posting results on KNBS website and data portal; production of digital storage media- DVDs, CDs and USB drives; Participating in public platforms for exhibitions e.g. Agricultural Society of Kenya shows; Library – The KNBS library stores publications as reference materials for researchers and the general public; Use of social media—twitter, you-tube, face book handle to share key highlights; Engagement of the media through media workshop briefs/breakfast meeting briefs; TV and Radio to share the key highlights.

KNBS tried to involve all stakeholders in census data dissemination planning, especially engagement with the Office of the President to give releases legitimacy and wider coverage. It is important to encourage structures that allow the engagement of key stakeholders from the start of the Census process. KNBS was obliged to release census data or grant access to the data when it is satisfied that all reasonable steps have been considered to safeguard confidentiality of the respondents taking into considerations the country’s legal framework on freedom of information, data protection, and ethical considerations; KNBS shares data/information to individuals or institutions after official release. Kenya was faced with inadequate resources to undertake disseminations to the lower sub national levels.

**Ghana**

Ghana disseminated the following reports from the 2021 Population and Housing Census:

* Volume 1: Preliminary Report (It contains provisional results released 44 days after exiting field work)
* Volume 2: Proximity of residential structures to essential service facilities (This report presents results of geographic analysis of access to essential services such as health, education and security at the district level),
* Volume 3: General Report (Consist of 11 sub-volumes with priority tables on age-sex composition; demographic, social and economic proﬁle; housing conditions, household amenities and assets; sanitation and ICT device ownership and usage.).
* Volumes 4 – included:
  + Volume 4: 23 Thematic Reports-These reports will present more detailed disaggregated statistics on policy-relevant and cross-cutting topics at the national and regional levels, using census data mainly.
  + Volume 5: 25 Analytical Reports-These reports will present ﬁndings from analyses to answer policy-relevant research questions, using census data and complemented with other data sources.
  + Volume 6: Census Atlas-The 2021 PHC atlas will present information on socio-demographic, economic and housing characteristics in maps at the regional and district levels.

Other products yet to be produced include plans to present statistics in interactive and user-friendly ways to promote usage of the data through the following mediums: Policy briefs; Interactive census results dashboard; Infographics; Dissemination seminars; Webinars for data users; Videos; 10% Public Use Microdata Sample.

**Malawi**

Malawi completed her digital census in 2018. The NSO produced print and digital products. Some of the products include: Census Preliminary Report, District Reports - 28 Districts and 4 Cities, Thematic Reports (17 types), Political Constituency Reports, Press Releases, Magazine and Newspaper inserts, Media and Policy Briefs, Data Wheels, Census posters A1, A3, A5, Roll-up Banners, Journal Paper - <https://content.iospress.com/download/statistical-journal-of-the-iaos/sji190587?id=statistical-journal-of-the-iaos%2Fsji190587>.

The website contains links to the main census report, thematic reports; Statistical tables; and Smart Census Application. The census products are also disseminated in the Malawi Data Dissemination Platform (MDDP). It has helped in enhancing / expansion of easily accessible digital dissemination of statistics through innovation; Support data analysis and dissemination of census reports, Widen data literacy and usage. MDDP offers: Statistical tables; Thematic maps; Platform with flexible search functionality that allows extraction of data: - To make comparisons; To yield insights into various aspects of Malawi’s social, spatial, and economic conditions; To create infographics for better understanding; Make independent data analysis. A demonstration on how the platform is used was made.

Malawi developed a monitoring and evaluation and crisis recovery plans for 2018 Census. Dissemination plan was proposed and developed by the NSO Publicity team that set-out specific objectives and expected outputs; Brainstormed on theoretical framework and strategies; Compiled/documented the proposed approaches and activities; Planned the resources (Communication channels, budget, human resources, etc.); Developed timelines for realistic completion of the tasks/activities; Devised a crisis recovery plan - performed a risk analysis and identified possible “plan Bs”; and Monitoring and evaluation plan.

The Dissemination plan was placed within the broader communication strategy of the 2018 Malawi Census; Regular consultation/bouncing with the PHC Communication strategy was carried out; Audience Analysis/Segmentation was done to Identify key audiences; Message identification, products design and medium/channel for reaching out to propose dissemination products, research and brainstorm on dissemination strategies/approaches, Document/develop dissemination approaches. Among the approaches used was mass communication –

- One of the successful approaches for reaching out to masses; Adopted to publicize census products and results through: Radio and TV programs; Press releases, Newspaper inserts, Street banners, Roll-up banners; NSO website and Data Dissemination Platform; Distribution - Libraries, Universities, District Councils/City Assemblies; Distributed Census results through memory cards – easy sharing.

-The second approach was: Interpersonal communication – planned working sessions, data literacy engagements with various groups including Members of Parliament, NGOs, CSOs, NSS/Line Ministries etc., social media- for updates and reminders: FB, Twitter, WhatsApp;

-The third approach included: Partnerships which included involvement of other organizations/institutions; Building third party and celebrity endorsements who carried along the messages from census; NSO website link on UNFPA-Malawi webpage; Advocacy/promotion activities which included making presentation during meetings, Panel discussions on census results during events (e.g. Launch of Data Dissemination Platform)

Malawi was faced with a challenge of including unplanned costs to cover DSA and high professional fees to engage communication experts.

**Mozambique**

From the 2017 census, the following products were produced: Preliminary and final Report (selected table); Brochure of National and Provincial summary results; Projection at national and provincial level; Shape file and geographic codes; REDATAM; PX-WEB; 10% public use micro data simply. Other products included: Atlas for children and general; Infantile brochure; Comics for teenagers and youth; Informative board on roads and borders.

**Eswatini**

Thematic reports and population projections reports were produced but the Launch of thematic reports was delayed by two years because there was a shortage of staff to undertake data cleaning. UNFPA provided a Census Technical Specialist who was stationed within the NSO, managed the production of census products.

The process of developing census products entailed; the involvement of subject area specialists from within and outside of government (NSO personnel including the GIS Unit, health, education, the UN and others); So far they have produced a series of thematic reports packaged in 10 publications.

**Tanzania**

The Initial Census Results was launched by the President of the United Republic of Tanzania on 31 October 2022, 45 days after completion of enumeration. During the launch the president, also launched the National Guideline for Utilization of Census Results. This is the first time Tanzania had such guideline. The main goal of the Guideline was to increase understanding, transparency and expand the scope of the utilization of the 2022 PHC Results for the Government of the United Republic of Tanzania and the Revolutionary Government of Zanzibar, Citizens and all stakeholders in inclusive planning for sustainable social development, economic and environmental.

In Tanzania, several dissemination platforms were used including the

i. **Traditional Media:** Newspapers (Printed and Online), Press Releases, Television and Radio Broadcasts

ii.**Digital Platforms:** Social Media (Facebook, LinkedIn, Twitter), Interactive databases, Geographic Products (Map Books, ATLAS), E-Government Portals, Mobile Technology (SMS)

**iii. Web Dissemination:** NBS and OCGS Websites, Online Data Access Platforms eg Tanzania Census App for dissemination (This can be downloaded from the GooglePlay Store or App Store)

**Other Approaches:** Public Dissemination Events, Workshops and Training Sessions based on the dissemination strategy, Thematic Workshops (this is planned to be conducted after the release of thematic reports).

In implementing the guideline for Utilization of Census Results, which identifies various groups that should be provided with the census results for planning and assessing various programs implemented by the government and stakeholders, the National Bureau of Statistics (NBS) has developed a strategy to Disseminate the results to different Government leaders and other relevant stakeholders.

The first census product was the Initial Results Publication, this was mainly developed by census technical team. Other products that include the Administrative Units Population Distribution Reports, Age and Sex Distribution Reports, The Tanzania Basic Demographic and Socio-Economic Profile and Constituency Population Distribution Reports were developed in collaboration of NBS/OCGS staff and other members from ministries, higher learning institutions and retired staff. Currently the Government is finalizing the Regional Basic Demographic and Socio-Economic Profile Reports which are also developed in the same manner.

There is a plan of contracting experts from the universities to write Monographs, however through development of these reports staff from NBS and OCGS and interns from universities will be involved to build capacity.

**Ghana**

The Ghana 2021 Population and Housing Census (PHC) dissemination phase aimed at sustained engagement with data users and proposed presentation of census statistics in interactive and user-friendly ways to promote uptake of the data over the next decade; The 2021 PHC dissemination activities aimed to: Communicate the results of the 2021 PHC, Highlight the resourcefulness of the data; Build public trust in the accuracy and quality of the data collected; Conduct consultations with data users to assess their needs; Present statistics in interactive and user-friendly ways to promote uptake of the data; Conduct sustained intercensal activities for continuity and maintain public awareness of the importance of the census; Share lessons learned from the 2021 PHC with the global community.

The Modes of Stakeholders Engagement included: Contextual interviews with key stakeholders; Publication of release calendar; Briefing of high-level government officials and census committees; Publication and dissemination of print and online reports; Publication of summary sheets and policy briefs; Interactive census results dashboard; Use of WhatsApp platforms (priority on platforms with high-level officials such as Ministers, CEOs,) for dissemination of graphics and short videos; Email updates to mailing list; Infographics, videographic and data visualizations; Interactive maps; Dissemination seminars/webinars with data users; Capacity building of data users to make data-driven decisions; Statistical awareness and educational programmes using traditional and new media; Blogs and podcasts; Statistical literacy course for journalists; Development of data product souvenirs (posters, calendars, notepads, novelty items, etc.); Statistical outreach activities and public policy advocacy; Publication and dissemination of annual population fact sheet; Development of a statistics for schools programme to encourage the use of census data ; Institution of an annual census awareness day to highlight census statistics; Documentation of the ways that census data is used for decision-making to be incorporated into the publicity, education, and advocacy campaign for the next census; Using Dissemination to Sustain Census Interest: Collaborating with Statistics Denmark to establish online databank; Launch of small business hub on census website; Post-release stakeholder data user seminars/webinars (MDAs, MMDCEs, private sector, media, CSOs, religious institutions, educational institutions, etc.

Release of thematic reports; Release of analytical reports; post-release media engagement; Census awareness day (annual); Launch of statistics in schools programme; Publication of annual statistical bulletin; Launch of share your census story campaign (in collaboration with Statistics Denmark. Dissemination – “Targeted Users”: Policy makers; Public administration; Academia/Researchers; Businesses; Development partners; Librarians; CSOs; Students; General public.

**Egypt**

The 2017 census results were published via a platform on the CAPMAS website. The platform disseminates the data from their Census. CAPMAS set up a Geoportal for GIS data from the Census. It used Google Analytics to monitor who are using their Census products. CAPMAS issues an annual schedule of publications, bulletins, indicators, statistical data, they are released and disseminated using various tools that include hard copy publications; soft copy on CD, press statements, Press releases, workshops & Conferences; Fax and Flyers.

CAPMAS was eager to provide users with the updated data upon their completion, so priority was given to the electronic publication of the preliminary results of the census until the results were published on the official website of CAPMAS. Website Analysis was done using Google Analytics specifically the usage of Google Analytics on the Website Analysis such as Wherefrom (Users’ login, total of users, their category such as: country, language, and detailed data page on views).

**Zimbabwe**

Zimbabwe produced 8 preliminary reports on a modular basis to provide quick feedback to the 2022 PHC users. Data on census preliminary reports was supposed to be used during 2023 National budget preparation and delimitation of constituency boundaries. Hybrid dissemination workshops were held both physically and virtually using Zoom and Team platforms. Subject matter discussions were also held. The census results were also presented to two Cabinet meetings. The rreports were also uploaded on the website [www.zimstat.co.zw](http://www.zimstat.co.zw) and Census page on the ODP was created. Social media was used like: Live streaming of presentation of results on Facebook (Zimstat), Twitter posts and updates (@zimstat), WhatsApp; Electronic and Print media: Invited journalists to attend dissemination workshops, Interviews in local languages Shona and Ndebele held; various Infographics. Some products generated included Census National Report; 10 Census Provincial Profile Reports; Vital Statistics Report from 2022 PHC data; 16 Census Thematic Reports building on 2012 experience; Census Atlas; and Thematic maps.

The following dissemination methods will be used for the outstanding products: posters, leaflets, wall charts, population datasheets, flyers and brochures will be produced and distributed in all the provinces and districts; Round table discussions and seminars for thematic reports; Media briefs, media releases and fact sheets for all the products. To allow for greater access, the 2022 Population and Housing Census dataset will be added onto the REDATAM-based census database systems which are currently uploaded onto the ZIMSTAT website (www.zimstat.co.zw). This will allow users to generate user-defined tables, graphs and maps using the 2022 Population and Housing Census data. Statistical awareness and educational programs on the ways to access, interpret and use census information will be done for effective outreach. Partnerships with the media to improve the wider dissemination and understanding of statistical information from census.

**Mozambique**

Mozambique engaged various stakeholders (political parties, ministry's, medias, NGOs, Donors, etc) from questionnaire development stage to dissemination stage. A dissemination plan was elaborated and implemented in accordance with stakeholders’ segmentation in which they grouped the users into various groups, identified the purpose for which they use the statistics produced, and the format that would be most useful to a given group.

The groups included: Universities (students/professors) and researchers; Development Cooperation Agencies, donors, international NGOs, and the United Nations; children and teenagers; Entrepreneurs, Banks, and Private Sector; Government; media; Politicians; Statistics Producers (INE, Bank of Mozambique, SEN members); People with special needs / people with disabilities; General public (using an inclusive methodology); Civil society, NGOs and religious institutions. INE mapped suitable formats for each user group and designed a product for each segment, including school children (e.g. comics for the Youth).

In the last census (2007) the thematic studies were written by NSO staff in collaboration with local universities. Differently, with 2017 census the approach was to use consultants. This imposed challenge on data use by consultants that require deep involvement of INE staff; When users are involved, making data available, explaining how to use and interpret the data, they respond positively; (example, NSO stabilized a partnership with media association, reining the media and stabilizing flexible communication channels such as WhatsApp; NSO created journalistic award; In response: all media refer to the NSO when talking about statistics; they constantly request for data and clarifications in the WhatsApp group; weekly they publish something about statistics; The average visits increased from 171,207 (2017 and 2018) to 288,721 (2020 and 2021)

**Eswatini**

The first Census in Swaziland was conducted in 1956 and since then, following the United Nations recommendations, the Government has kept up to the 10 years schedule. The last census to be conducted was in 2017 census. The census preliminary report was published within four months (September 2017) after enumeration, the thematic reports were done after 30 months (December 2019) after enumeration and the population projections was done in August 2020 (more than 3 years). These reports were printed and availed in soft copy on USB flash disks, and on the Central Statistics Office and Government website. Each report was disseminated as soon as they were published, through stakeholder workshops and electronically for individual user requests.

## 10.3 Challenges and Lessons Learnt

Digital transformation is not without its significant challenges, which range from infrastructural deficits to a lack of technical expertise.

* Development of census products is an integral part of the entire census process, failure in one step affects the other (see the case of Eswatini).
* Dissemination of census reports by various means helps to increase the awareness and use of census results hence increase the value of money used to implement the population census
* **Financial constraint:** included among others – 1) financial resources being inadequate and unpredictable, 2) withdrawal and reprogramming of approved resources leading to scaling down and making budget adjustments, 3) difficultly to plan based on pledges and unstable resources disbursement plan. Some countries still lacked funding for more dissemination workshops such as university students who will utilize the census data for in-depth analysis as well as businesspeople for investing area etc.
* **Staffing issues:** Understaffing and high vacancy rates at the NSO leads to overlap of personnel duties. Limited technical expertise to develop offline dissemination products, effectively anonymize microdata data.
* **Effect of Covid19**: the preventive measures derailed and affected implementation of some planned activities for countries were already undertaking the census such as Malawi.
* **Online dissemination:** Countries were challenged with the high cost and unstable internet connections due to poor network. The user of unlicensed applications to avoid costs caused interruptions such as zoom meetings were often hacked into. It is noted that the speed, volume and reach of today’s digital information flows are also creating conditions for misinformation, fake news, and false ‘evidence’ to thrive.
* **Non acceptance of census results:** some stakeholders may refuse to accept the released results for various reasons as was the case for the 2019 KPHC data.
* **Failure to use simple language to explain concepts:** In Zimbabwe, users had problems in understanding concepts and definitions in the functioning, housing characteristics and labour force modules. Journalists had problems in interpreting and reporting on the maternal mortality ratio as well as Life Expectancy at birth. This was also coupled with failure to interpret census results in local languages.
* Mozambique appreciated that CAPI enabled the office to receive timely data thus making the production of census products more efficient than in previous censuses; for the office to use CAPI to its fullest advantage, the application had to run as smooth as possible; But because the data collection process was not 100% perfect, this resulted in the data processing unit taking longer to clean the data for use in analysis. This resulted in the launch of the thematic reports to be delayed by a couple of years.
* Disseminating through stakeholder workshops was the most effective way however, they are expensive as these workshops take place in hotels, lodges, and community halls where refreshments must be provided. Government does provide a budget which then needs to be supplemented by other development partners; availability of technical assistance to support the preparation of census products is key. This is necessary for strengthening the capacity of the NSO and local skills in general.
* Other challenges existed such as unstable government internet, insufficient funding for dissemination workshops, insufficient analytical skills for specialized themes such mortality, fertility, and migration.

Some of the limitations for proper archiving of census materials and products include:

* Legal obstacles- there may be no sufficient policy framework in place to guide in archiving of the census records and materials.
* Technical capacity obstacles may include lack of in-house capacity to handle complex aspects such as data anonymization and curation of microdata to ensure its long-term availability. Lack of training in creating metadata records for microdata. Lack of capacity to administer existing microdata dissemination platforms and limited microdata archiving skills.
* Technological challenges, for instance lack of adequate computers, lack of a functional website or outdated website or websites that are not optimally functional. Nonexistence and outdated microdata dissemination platforms. This is coupled with the rapid pace of technology and the fast-changing nature of electronic data storage media present a challenge to the preservation of information over a long period of time. With the rapid change of technology, migration of archival systems to modern ones is inevitable. This calls for digital migration to improve cost effectiveness, avoid media decal and adhere to new user requirements.
* Inadequate financial resources to support the process of undertaking documentation of microdata files, to meet the costs of creating access tools and safeguards, and of supporting authorization enquiries made by the research community; helping data users of microdata files to navigate complex file structures and variable definitions.
* Limited budget allocation to archiving - Government and donor expenditure is allocated mainly for data collection, and very little funding is provided for the long-term preservation, archiving of census records, and sharing of micro-data.

## 10.4 Recommendations

Based on the case studies and lessons learned, it is recommended:

* The tabulation plan and analysis should be handled by the subject matter experts from within the NSO and the relevant line ministries to guide on the relevance and interpretation of the results to enhance its use.
* Ensure adequate budgeting and resource mobilization for development of various products, dissemination and archiving should be in time to ensure the financial support is availed in time.
* Timely launch of the reports has been necessitated and facilitated by technology. Countries should therefore commit to availing the various products in time to the stakeholders to use in the programming and policy formulation.
* Planning and development of the census products should be well thought out, planned, and budgeted to have a successful outcome of the census without delays in release of findings. Untimeliness compromises quality and trust in the data.
* There is a need to address geographical boundary disputes before launch and dissemination of reports by administrative/political boundaries. These disputes affect enumeration and can be resolved and agreed upon during map verification.
* Need to identify various users/stakeholders in time and engage them in the entire census process as this ensures key indicators are included in the various products and provision of technical/financial support; Identification of thematic experts and engaging them in time.
* For archiving, the nature and format of the census data files created in the data processing and dissemination phase should be anonymized microdata and become a standard feature of census data dissemination for the 2030 round of censuses.

Based on the challenges and lessons documented, the following recommendations are proposed:

* NSOs need to plan for dissemination of results ahead of time as it informs resource allocation for the census. Having a successful dissemination schedule/plan necessitates all reports and publications to be produced and released within the timelines; A dissemination plan is priceless as it allows easy implementation of dissemination activities.
* Solicit for the government political will and stakeholder involvement in all census phases to avoid rejection of results. For instance, engage the Office of the President during release of the data to build goodwill from the public as well as give adequate publicity for the dissemination.
* Additionally, census implementing agencies should leverage on technology developments and social media platforms for the census products to reach a wider audience while taking care not to neglect those not able to access the technology.
* There is need to further decentralize the dissemination of census results from regional down to constituency levels.
* In Eswatini, a national user consultation and telephonic surveys was scheduled. Participants concluded that user involvement is important and productive in all phases of census and development of thematic studies is better to prioritize engaging technical personnel from NSOs, universities and relevant Ministries.

## 10.5 References

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