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AND HOUSING CENSUSES IN THE PACIFIC
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Experience from the Pacific – Lessons learned for 2020

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1. INTRODUCTION

Population and housing censuses represent one of the major source for the data collection on the number and socio-economic and demographic characteristics of the population of any country. It is a part of an integrated national statistical system, which includes other censuses (for example, agriculture), surveys, registration systems and administrative records. As we know, censuses provide at regular intervals the benchmark for the population counting at national and sub-national levels. For small geographical areas or sub-population it may represent the only source of information for certain social, demographic and economic characteristics. For many countries in the Pacific the censuses also provides the only source for a solid framework to develop sampling frames.

In this paper we summarise the main purpose for taking censuses - the user information needs, and related data products for meeting the identified user needs. The paper then notes the various technical support to countries to produce some of the listed census data products and services, as well as highlighting the census information gaps. The paper concludes with a summary list of census products that could create more user demand for relevant census result.

Please note that the paper looks at a broader census information services as opposed to focusing on census analytical reports which is just one of the many census information products. What the paper does not cover is charging users for census information products and services in the name of production cost recovery.

2. THE INFORMATION NEEDS

Population censuses serve as one of the main source for information in support of government development policies and strategies. Such census information needs are usually discussed with census users and documented early in the census planning and questionnaire design stages. For some countries, the census is the only source of this information on the socio-economic characteristics of their populations.

With the rapid development of information and communication technologies, census data users have an increasing interest in a broad range of data products and services from the census offices that meet specific information needs. Furthermore, the increasing availability and accessibility of computers and related technologies with internet connections, some data users increasingly prefer to obtain soft copies of census products or online downloading rather than in printed form. However, there are still many users in the Pacific who would prefer to receive census results in printed form. The high cost of

producing census products in various formats, for example, printed, in computer media or online, as well as the skills (of both users and producers) required for such undertaking restricts Pacific countries in the choice of census products development and subsequent dissemination.

In addition, some data users need specialized products that the census offices do not produce as part of the general census product development. In such cases, census offices provide the specialised requests direct to users (upon request), usually on a cost reimbursement basis or just free. As noted above, consultation with data users is usually recommended prior to deciding the type of services and products that may be required by different data users – even then, many data users in the Pacific do not know what their data needs are which makes it difficult for census offices to develop relevant data products and services.

Therefore, understanding the information needs and producing the products to meet such needs are important to make census relevant to information needs of the government and of the other users. Knowing the information needs of users then leads to developing information packages and making them accessible which can be realised in a number of ways. For example, tabulations required by only a few users, such as certain government offices or specialized research organizations can be supplied in unpublished form (that is to say, unpublished hard copy tables or tabulations in soft copy). Some data may not be tabulated until they are specifically required by users.

Further, computers and internet provides the opportunity to produce a greater number and a wider variety of tabulations than was the case with census tabulation procedures in the 1980 and 1990 round of censuses. As is commonly noted, data stored in the census databases represent a rich source of information, which allows fast and relatively inexpensive production of additional tables or related products as they are requested. Online access or dissemination of such census information greatly contributes to expanding census data user base and thus the increased demand for census data. However, it is also important to inform users about possible data errors as part of the product development process. Similarly, confidentiality issues need to be addressed and appropriate safeguards established during the census product development process and related dissemination.

3. SUGGESTED CENSUS PUBLICATIONS/PRODUCTS

In this Section of the paper, we summarise a list of key census products (and a brief description of the content of the products) suggested under the *UN Principles and Recommendations For Population and Housing Censuses Revision 2*.

(i)   Provisional results

The initial release of population counts is generally awaited with anticipation, from the general public to programme and policy administrations. Thus, some countries release provisional results very soon after enumeration is completed. Data users should be made aware of implications of using provisional population counts. The schedule and description of upcoming releases of final results and products should be made public early in the process to maintain interest by the public in the census. The releases can be staggered, from simple, descriptive one-page summary fact sheets covering a country's major geographical divisions initially, to more comprehensive tabulations and descriptive reports later on.

> **(a)   Products based on new census questions** – during the preparation for the production of provisional results, it would be a good idea to consider cross-tabulation specifications and related product specifications for new census questions introduced in the current census. A new question is defined as a census question on any topic or subject-matter asked in the present census which was not asked in any previous census. In such cases, it is best to engage with users of new questions to collaborate in product specification and development.

(ii)   Basic tabulations

Every effort should be made to publish the principal results of a population census (such as those on age, sex and geographical distribution of the population) and of a housing census (such as a geographical distribution of sets of living quarters, households and population by type of living quarters) as soon as possible after the enumeration, otherwise their usefulness and the extent of their interest to the public will be diminished. With the universal use of computers and in a few cases using scanning technology for the processing of census data, the time required for processing has been greatly reduced in comparison with that for older forms of processing. Tabulation products could be printed, soft copies in CDs or stored in table retrieval systems or similar media.

The topics for population and housing census tabulations listed below are intended to provide, in published form (printed or soft), the most important census information needed as a basis for programmes of economic and social development and to be used for research purposes. They do not in any way represent all of the tabulations that a given country may publish and certainly not all of the tabulations that may eventually be prepared for special purposes. The tabulations do not take into account the form in which information may be entered into a database, which may be more detailed than that required for these illustrative census tabulations.

Please note that while the census is the main source of information for the tabulations below, other sources may include surveys and civil registration. This is particularly the case for countries with well developed vital statistics systems that provide input to the tabulations on fertility and mortality.

List of general topics or areas for tabulations for population censuses:

Group 1. Tabulations on geographical and internal migration characteristics
Group 2. Tabulations on international migration and immigrant stock
Group 3. Tabulations on household and family characteristics
Group 4. Tabulations on demographic and social characteristics
Group 5. Tabulation on fertility and mortality
Group 6. Tabulations on educational characteristics
Group 7. Tabulations on economic characteristics
Group 8. Tabulations on disability characteristics
Group 9. Tabulations on housing characteristics

(iii)   Metadata

Metadata is a key element of census product to ensure that the underlying concepts and definitions are well understood and that the results are well interpreted. All tabulations should include the following metadata or references to where this information can be obtained. Census questions; reasons why they are asked; conceptual definitions (census dictionary); geographic hierarchies used; changes since the previous census with regard to content, operational methods or geographic boundaries; and quality indicators such as coverage rates and item non-response, etc. When the census tabulations include suppressed data cells due to small numbers, the metadata should also include a methodological note on the rules and methods of suppression.

(iv)   Thematic analytical reports

These are the most commonly developed data products or services. Many countries prepare different types of thematic or analytical reports. They may range from volumes presenting extensive and detailed statistical tabulations, particularly cross-tabulations, to more analytical reports that combine tabular and graphical materials with some interpretative or analytical text. This latter group of reports might include, for example, *volumes of national and provincial or outer island analysis* on such subjects as population counts and characteristics, or housing conditions of urban areas, and population

distributions; and comparisons of key social and economic indicators such as education, living arrangements, housing conditions, water and sanitation and economic activities, including remittances. Other such reports might include *community profile analysis*, of, for example, the indigenous population, and so forth and *profiles of specific population groups*, such as families, children, youth and the elderly population. Reports on *population growth and distribution* that examine changes in the demographic characteristics of the country's population with breakdowns by two or three levels of administrative areas are often useful. Such reports might focus on the growth, location and mobility of the population at the national and sub-national levels, and lower administrative areas.

The definition of development indicators that links to specific policy/planning frameworks and data mining/extraction to populate the defined indicator list makes such products more relevant to user needs.

(v)   Other reports

It is important that users of census products be provided on a timely basis with as much relevant information regarding the census as possible. A publication that contains information on all types of products that will be available following the census is very useful to users. A brief description of each product should be provided including the estimated timing of release, the level of geographical detail that each product carries and, for products released periodically, the frequency of release. In the case of large census operations, several such documents tailored to the needs of different sets of users (for example, users in education, health or local government or Island Councils) may be useful.

Some countries publish a *census dictionary*, which contains comprehensive definitions of terms and concepts and detailed classifications used to present census outputs. Some countries also publish geographical classifications and codes and the definitions of areas used in the census and their relationships with the administrative areas. Explanations of user-defined areas for specific census tabulations and the type of format available (printed or electronic) may be provided. Information contained in these types of products usually serve as additional or main input into census metadata products.

(vi)   Procedural report

One of the most important reports in any census publication programme is the *administrative report (sometimes called census director's report in some countries),* which is a record of the entire census undertaking, including problems encountered and their solutions. The report may include the following topics - brief history of the census in the country, legal basis for conducting the census, budget requirements and control, census committees and their activities, census organization and personnel structure, quality control procedures, census calendar, census cartographic work, development and design of the questionnaires, enumeration methodology of each census, field organization, manual editing and coding, data-processing development and organization, data capture, computer editing and imputation procedure, computer hardware and software used, census evaluation, publication and data dissemination programme.

The census administrative report is very useful both for the users and for the census organization itself. Given the long lapse of time between censuses and the likelihood of changes in personnel, the administrative report is an essential product for the planning of future censuses, serving as institutional memory.

In addition, with developments in information technology, the census data files and publications have become increasingly available in computers and internet. A description of the procedure in the development of these data files may also be included in the procedural report. Consideration of a separate volume of the procedural report for the processing and dissemination phases may be considered to ensure the completion of the planning and field operations phases immediately after the census enumeration.

(vii)   Basic mapping

Published analogous and digital maps are tools that make the census results more understandable and easier to use. The provision of maps serves two purposes: first, census area identification maps locate and show the boundaries of all administrative areas for which data are reported in census publications and, second, statistical or thematic maps present the significant results of the census, thus allowing the general user to visualize the geographical distributions and patterns inherent in the data. Well-designed and attractive maps will interest the users of census reports, and may raise questions that send them to the statistical tables for further details.

There are three major types of area identification maps that are commonly used in most census publications: (*a*) national maps showing the boundaries of the first- and second-order geographical divisions and of the major cities or metropolitan areas; (*b*) maps of each first-order division showing the boundaries of the second- and third-order divisions for which statistical tables will be prepared; and (*c*) urban or metropolitan maps showing small sub-area boundaries as well as general streets, roads and rivers.

The purpose of statistical maps is to present the results in terms of their geographical distribution. There is special interest in the current pattern of the distribution and also in changes in the patterns that have occurred over time, particularly since the last census.

(viii)   Thematic mapping

As regards *thematic maps*, priority indicators for a population and housing census are total population and its distribution by sub-areas, population density, urban and rural population or metropolitan and non-metropolitan population, and changes in the population totals since the last census. Other important indicators include age, sex, fertility, mortality, migration, educational attainment, employment, household size, type of housing, ownership, number of rooms, and sanitary facilities, with a growing demand also for data on communication (telephones, television, computers and internet access), transport (vehicles), a broad range of household amenities, and recently also population-based development indicators such as household access to safe water, household waste management, and multiple sources of household incomes, such as the incidence of remittances. This list of indicators is merely an illustration of the type of thematic maps individual countries might find useful to produce. Producing maps using the same set of indicators enables countries to meaningfully compare their results over time and with international or regional norms.

(ix)   Interactive digital outputs

We have always agreed that it is important that census data and information products are widely disseminated and communicated, and that organizations involved in this process have a user satisfaction focus, and place more emphasis on providing a customer/user service than merely providing products, and be guided by user-relevance and user-friendliness in all its operations, rather than by tradition in producing tables, graphs and reports that they have always produced.

While statistical tables or census reports, printed or digital maps and atlases, including the provision of some dynamic mapping capability, can be conveniently disseminated through various forms, including different types of ICT, growing demand by users for an ever-growing variety of census data outputs is most effectively and efficiently met by enabling and empowering ICT literate and online census data users to access census data themselves, and build their own customized tables or spatially configure data outputs according to varying spatial requirements. Analytical tools like population geographic information systems, data cube and REDATAM are good illustrations of recent developments that make census data accessible on national statistical office websites and through CD ROMs.

(a) Geographic information systems

Geographic information systems (GIS) embody hardware and software configurations designed to support the capture, management, analysis and dissemination of spatially referenced data. Applied to census activities and outputs, such systems facilitate census cartography and data capture, and by linking population data (demographic, social and socio-economic) to geographical areas, GIS provides very powerful data management functionalities in allowing users to explore, analyse, describe and communicate population census information according to their own data and information demands.

(b) Data cube

Data cube's on-line analytical processing capabilities enable analysts and managers to gain insight into various situation analysis through a wide variety of views of data organized to reflect its multidimensional nature. It gives insight into data through fast, consistent, interactive access to a wide variety of possible views of information. It is used to summarize, consolidate, view, apply formulae to, and synthesize data according to multiple dimensions.

(c) REDATAM

Redatam is an acronym for *REtrieval of DATa for small Areas by Microcomputer.* The program uses a compressed hierarchical database, which can be created in *R+G4*, and which can contain micro data and/or aggregated information with millions of records for persons, houses, city clocks or any geographical division of a country. These data can come from any combination of census, survey or other sources. A database can be processed in association with external databases in common formats such as dBase. Very large non-geographical hierarchical databases have also been created in such fields as International Trade.

The user can define any area of interest in a database (such as an EA) or any combination of areas, create new variables, obtain various types of tabulations extremely rapidly, export outputs to other software and graphically display results. The data at different geographical levels can be combined hierarchically to create aggregated variables and the results shown on maps in *R+G4* or transferred to a Geographical Information System (GIS).

(x) General interest products and special user reports

The traditional approach to the publication of census information is through release of cross-classified tabulations. This is not, however, easy for non-expert users to access. As these traditional forms of data on population and housing censuses are being published, there are many ways to disseminate census data in a more accessible form of packaging and thus increase the utilization of the information collected. It should be noted that the following data products can only be effective in encouraging the use of census information if it is prepared in a timely and professional manner. This will require specialist skills from people used to writing for these audiences, the use of high quality materials and considerable planning. As such resources are often expensive, any country planning to undertake such campaigns should allow for the costs of such activities when planning their census budget.

(a) Posters

One of the most common ways to disseminate census information consists of publishing posters highlighting key facts such as: How many are we? Where do we live? and summarizing a profile for the major administrative divisions or islands of a country. Posters could also be prepared addressing issues relevant to special population groups: teenagers or youths, adults, indigenous populations, older age groups, and women's groups, etc. Since the objective of a poster is to catch the eye at a distance, relatively few facts should be presented in a way so that the key message is immediately visible. Posters can be greatly enhanced by the addition of a well-designed graph and the use of fonts to increase the readability and comprehensibility of key messages.

(b)   Brochures

Professionally designed brochures are another way to disseminate basic census data. These brochures should be written in a very easy and comprehensible language indicating the demographic profile of the country illustrated with suitable graphics and explanatory material. In some countries these brochures could be addressed to specific relevant population and development issues. They are particularly suitable for preparation as give-aways for people attending events, such as the launch of more traditional materials, or for inclusion on display shelves in libraries of government offices.

(c)   Special user reports

Information generated by a census is by definition of use to a wide range of users with a wide range of statistical expertise. Thus, NSOs may wish to prepare specific analytical reports for special audiences. While these reports may not require the attention attracting features of the posters and brochures, they will need to incorporate a high level of very sound analysis undertaken by subject-matter specialists. The target audience might be any part of the census user audience interested in the topic and may respond to issues raised by the public during census user consultations of the collection.

(d)   Videos

The use of graphics such as charts or maps included on videotape; compact disc (CD) or digital video disc (DVD) format are media useful to promote the story behind the numbers and thus increase use of census data. These might indicate how census data can assist policymakers, planners and people in general to understand their societies and how census data can assist in identifying the main problems and assist with evaluation of solutions.

(e)   Instructional materials

Instructional materials in an easy to understand form can be prepared for the general public, indicating the advantages and limitations of census data. Such material can often form the basis of information campaigns as part of the advocacy material for the next census.
A particular implementation of instructional materials can be the preparation of a kit for use in schools. Not only will this provide high quality information for the students but, by including exposure to the use of statistical materials in the school process, it will encourage the use of evidence based analysis throughout society. It should be noted that professional assistance should be sought in ensuring that these materials follow sound educational practices and can be accommodated within the appropriate curriculum.

4.   CENSUS PUBLICATIONS/PRODUCTS DEVELOPMENT ASSISTANCE TO PACIFIC COUNTRIES

Technical assistance to countries to develop census products were mobilised and delivered in the following manner:

(i)   Direct technical assistance to census offices – technical adviser working with one or more national counterparts;

(ii)   Short-term consultants engaged to provide support externally with specific TOR and time frame; and

(iii)   Work attachment to complete the production of data products and services.

The following were the common census data products/services where external support was sought by Pacific countries during the last (2000) and the present (2010) round of censuses:

(i)   Provisional results

UNFPA, SPC and other partners had assisted many Pacific countries to produce this products in the form of simple, descriptive one or two page summary fact sheets covering a country's major geographical divisions and age and sex compositions with tables and charts initially, to more comprehensive tabulations and descriptive reports later on.

(a)   Products based on new census questions

SPC experience with some countries in the present round of census is the there were difficulties by census analysts in properly determining what outputs were to be produced for some of the new questions added in to the census – which were determined during the data analysis as they progressed. Of course this is not a best practice as we can't produce some desirable outputs on the fly. Best practice is to design and specify relevant products in collaboration with the users who sponsored the new census questions well in advance of census product development stage.

(ii)   Basic tabulations

SPC supported some countries with the production of these products. Some countries had spent work attachment periods in Noumea to produce and finalize tabulations.

(iii)   Metadata

SPC and partners have commenced assisting the countries to produce metadata on the most recent censuses. Many countries present in this meeting had attended some of the training workshops organized by SPC. It will be interesting to know what progress had been made since the training.

(iv)   Thematic analytical reports

This is the most common census product that is supported by SPC, UNFPA and partners. Many countries in the Pacific had utilized external technical support with the development and production of this or related census products like population profiles. These are developed either in country or outside the country. However, many of these products are restricted to total population distribution, composition, growth, as well as population processes, including housing characteristics. There is much thematic information from censuses that are usually not analysed and reported because there is no demand in country or because there is not skilled human resource to produce these in countries. The main reason for lack of demand is usually because many users do not know what census information is available or they simply lack the knowledge and skills to link census results to their policy or research needs.

The definition of development indicators – SPC has worked with countries to define National Minimum Development Indicator (NMDI) Database in support of policy work and some of the key sectors where SPC works in countries. NMDI database has a subset on MDG, and others like food security indicators will be developed in collaboration with countries as work progresses over the coming months. Other census products in this category included Pacific Youth Database, and Culture is also considered.

(v)   Other reports

A few countries have developed products like these that contained information on all types of products that will be available following the census. A brief description of each product was provided including the estimated timing of release. Some of these products contained definitions of terms and concepts and detailed classifications used to present census outputs. Some countries also published geographical classifications and codes and the definitions of areas used in the census.

SPC had recently produced a number of information products covering different aspects of the census – Scanning, Census Cartography and Pacific Census Managers Guide (in collaboration with Vanuatu National Statistics Office).

(vi)   Procedural report

Some countries in the Pacific had produced some of these procedural reports for the census as a whole of some aspects of the census operations and procedures.

(vii)   Basic mapping

Some countries in the Pacific had produced some aspects of basic census maps with SPC assistance.

(viii)   Thematic mapping

Some countries in the Pacific had produced some census thematic maps and compiled atlases with SPC assistance.

(ix)   Interactive digital outputs

There exists a lot of potential for development in this area of census product when resources are available and when users realise the opportunity for such product developments.

(a)   Geographic information systems

This tool based on census data was introduced in some countries in the Pacific either with SPC assistance (PopGIS Application) or with the assistance of UN DevInfo Team (DevInfo Application).

(b)   Data cube

This tool was discussed in the Pacific in various ways but yet to progress in mobilising resources and support to progress development.

(c)   REDATAM

This tool was introduced in the Pacific in 2011 through a UNFPA supported workshop in Suva. How far it has progressed in-country is yet to be evaluated.

(x)   General interest products and special user reports

A few countries produced census products on CD or DVD, including the PopGIS products. However, not many countries developed and produced many other products under this category for various reasons –resource constraints and lack of demand were the main reasons; opportunity for development in the next round of census.

5. CENSUS PUBLICATIONS/PRODUCTS AFTER THE 2020 ROUND OF CENSUSES

The challenge for many NSOs or census offices in the Pacific is to create the demand for census data products that are relevant to user needs and are user friendly. But from the above review it can be seen that there are a few products that are commonly produced, which are not quite attractive (looks) or very user friendly for many potential census data users. These include:

- Provisional results – many countries have produced these products

- Basic tabulations - many countries have produced these products

- Lengthy analytical reports - many countries have produced main census reports, demographic reports, reports on specific socio-economic topics, population topics

- **The definition of development indicators** – many countries have produced summary list of indicators extracted from thematic census reports which do not link to particular policy needs..

The challenge for the Pacific is to consider developing data products that are short and simple and that carry key development messages or behavioural change information which would lead to creating user demand for such census products. The following products have the potential for creating demand for census results if they are specifically linked to policies and plans of users:

- **The definition of development indicators** – that are linked to national development strategies, sector strategies/planning documents, regional or global reporting requirements (MDG/CEDAW) or new emerging reporting/monitoring priority areas (climate change and food security).

- Basic statistical maps

- Thematic map – development indicators on maps would potentially create demand

- Interactive digital outputs – like GIS Applications, data cubs or REDATAM

- Metadata - will add a lot of value to all other products, many advanced users will appreciate information about the input data used in producing the above products.

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