COUNTING THE PEOPLE

CONSTRAINING CENSUS COSTS AND ASSESSING ALTERNATIVE APPROACHES

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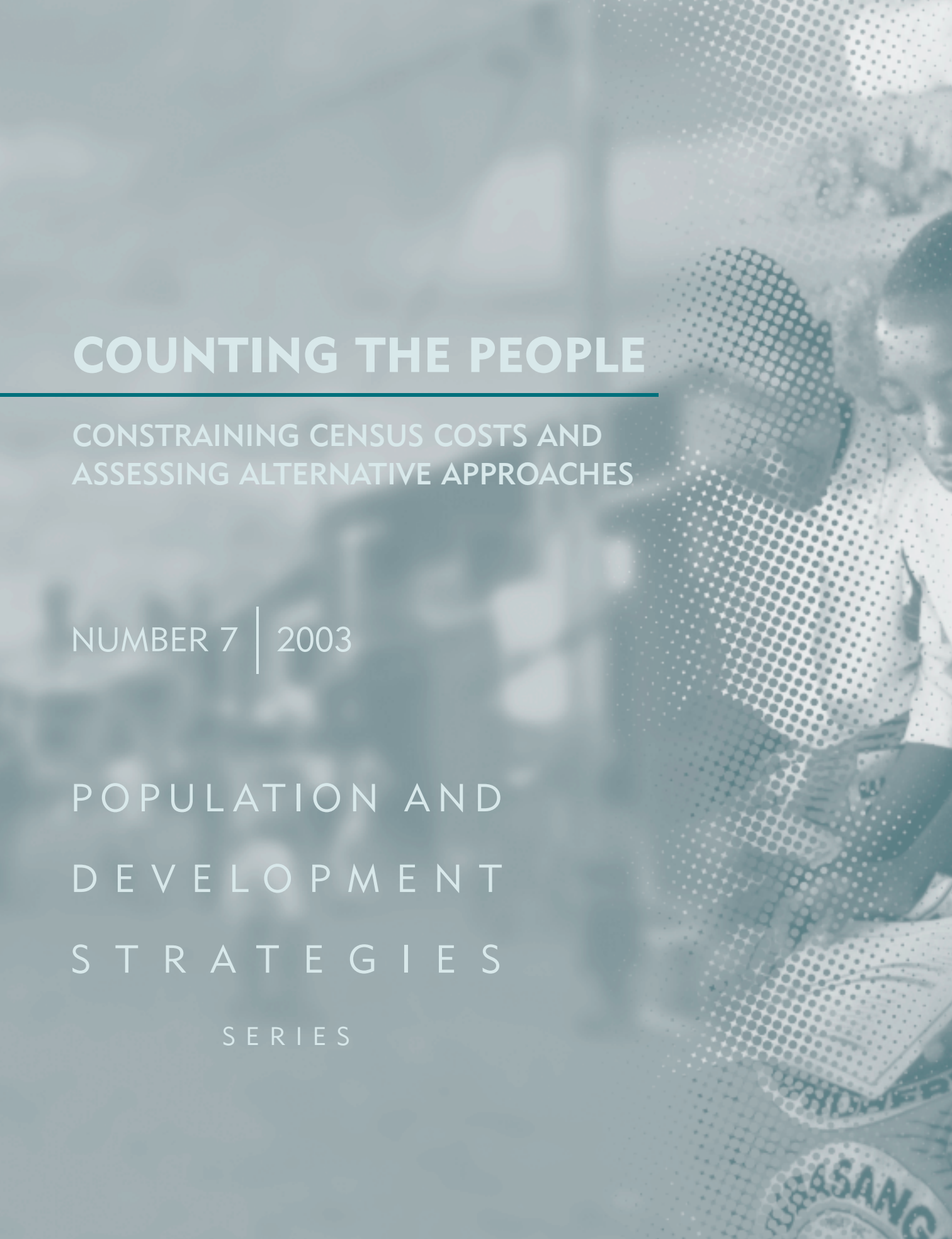

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FOREWORD

UNFPA working in partnerships, especially with the United Nations Statistics Division, has led worldwide support for population and housing censuses since its inception in 1969 and continues to play a leadership role. A census is the primary source of information about the number, distribution and characteristics of the population. It provides data on disadvantaged regions and vulnerable populations, such as the poor, the young, the old, and especially the female population. Only a census can provide the level of resolution and the accuracy of data that allows analysts and policy makers the requisite detailed population and development information.

Census information establishes an objective evidence base on which to formulate development strategies. Thus with census data many of the population-based indicators required for monitoring the Millennium Development Goals (MDGs) and the agenda of the international conferences of the 1990s, notably the International Conference on Population and Development (ICPD) and ICPD+5, can be obtained. No other data source allows for such a comprehensive gender analysis of population-based indicators.

As the number of countries in the world has grown and the cost of conducting censuses has risen, it has become increasingly difficult for donors, including UNFPA, to support governments in their aspirations to conduct a first, or subsequent census. Yet, for example, in a post-conflict situation, where the national statistical system has often collapsed, a census not only provides basic planning data, but crucially also provides the foundation for the development of democratic institutions and good governance.

Almost all developing countries have had some experience in census taking over the past several decades, although many still lack the financial and human resources to conduct regular censuses without at least some external technical and/or financial assistance. For countries that cannot afford the full cost to undertake a census, international support is critical. The scale of demand far exceeds the capacity of any single organization. And so UNFPA frequently assists in mobilizing support for censuses from a wide range of bilateral and multilateral donors.

The time is rapidly approaching when the ever-growing costs of funding a census will no longer be able to be met, even from the combined available resources of developing and transition countries, United Nations agencies and other donors. It is therefore prudent, and indeed increasingly essential, to identify and develop alternate strategies that will enable countries to maintain and improve their capacity for *Counting the People*.

The papers in this report are based on an edited selection of presentations made at two meetings on population censuses. The first was the *UNFPA/PARIS21 International Expert Group Meeting on Mechanisms for Ensuring Continuity of 10-Year Population Censuses: Strategies for Reducing Census Costs* held in Pretoria on 26-29 November 2001 and generously hosted by the Government of South Africa. The main purpose was, in the light of funding constraints experienced by developing countries in the 2000 round of censuses, to review census funding issues, and to help map the way for achieving stability and cost effectiveness in the future funding of censuses. Summaries of all the presentations made at that meeting are contained in UNFPA (2002a), and at http://www.unfpa.org.

The second meeting was a UNFPA *In-House Capacity Building Workshop on Population Censuses: New Directions and Cost Saving Strategies* held in Princeton, New Jersey, on 21-23 October 2002. The main purpose of that meeting was to review the strategic guidance on UNFPA support for population and housing censuses.

Census taking is the most costly data collection activity that a national statistical system undertakes. Unless timely and sufficient resources are available census taking will have an uncertain future. Partnerships with major stakeholders, including bilateral and multilateral system part-

ners, civil society and the private sector, are essential for ensuring continuity of censuses. This report provides some of the new ideas for reducing census costs and for assessing some alternative census-taking approaches that were presented at the two meetings.

On behalf of UNFPA, I would like to take this opportunity to thank PARIS21, EUROSTAT and the United States Bureau of the Census for their support of the Pretoria Meeting, as well as to Statistics South Africa for hosting that meeting. Thanks are also due to all the participants who attended the meetings mentioned above for sharing their expertise and wisdom in the area of population censuses. I would like also to thank my colleagues from the Geographical Divisions at UNFPA Headquarters, especially Africa Division, and the census experts in the UNFPA Country Technical Services Teams (CSTs) for their good support. Finally, I would especially like to thank members of the report team and paper contributors (**Page vi**) for their hard work and commitment in contributing to this report.

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List of Acronyms

APR	Asia and Pacific [Census] Recommendations
CAC	Computer Assisted Coding
CARICOM	Caribbean Island Community
CCA	Common Country Assessments
CIDA	Canadian International Development Agency
CSO	Central Statistical Office (synonym: NSO)
CST	(UNFPA) Country Support Teams
DFID	Department for International Development (UK)
ECA	Economic Commission for Africa
ESCAP	(UN) Economic and Social Commission for Asia and the Pacific
ECOSOC	(UN) Economic and Social Council
FNUAP	Fonds des Nations Unies pour la Population
GIS	Geographic Information Systems
ICCC	Interagency Census Coordinating Committee
ICPD	International Conference on Population and Development
IMF	International Monetary Fund
IMPS	(USBC) Integrated Microcomputer Processing System
MDG	Millennium Development Goals
NIDI	Netherlands Interdisciplinary Demographic Institute
NSO	National Statistical Office (synonym: CSO)
OCR	Optical Character Recognition/Reading

OMR	Optical Mark Recognition/Reading
PARIS21	**PAR**tnership **I**n **S**tatistics for development in the **21**st Century
PES	Post Enumeration Survey
PIC	Pacific Island Countries
PRSP	Poverty Reduction Strategy Paper
SADC	Southern African Development Community
SPC	Secretariat for the Pacific Community
TCDC	Technical Cooperation among Developing Countries
UN	United Nations
UNDAF	United Nations Development Assistance Framework
UNECE	United Nations Economic Commission for Europe
UNFPA	United Nations Population Fund (formerly the UN Fund for Population Activities)
UNICEF	United Nations Children's Fund
UNSD	United Nations Statistics Division (formerly UNSO)
UNSO	United Nations Statistical Organization (now UNSD)
USAID	United States Agency for International Development
USBC	United States Bureau of the Census
WB	World Bank

INTRODUCTION

To the uninitiated, the collection, processing and release of reliable and timely statistics is deceptively simple: *'You ask a few questions, tabulate the results, and release them. What's the big deal?'* It is often difficult to convince people who hold such views that it is not only worthwhile, but essential, to budget the sums necessary to conduct a decennial census of population and housing. It is especially important to convince decision makers, particularly persons who control the keys to the national treasury, of the unparalleled wealth of information that a census provides.

The problem of getting sufficient funding for compiling and processing statistics in general and censuses in particular, is a common one and not limited to developing countries. It is indeed a fortunate National Statistics Office (NSO) Director whose minister appreciates the importance of statistics as an indispensable aid to decision making. Yet, in order to obtain the funding required to conduct a census, the Director will need to advocate to ministers and their senior civil-servant advisers of the importance of this information for the public well-being. To achieve this, the statistician needs to be able to explain comprehensively but persuasively precisely what is involved in the acquisition of statistical data and, more importantly, the cost to the nation of not having this information.

The papers included in this document are selected from two meetings expressly aimed at identifying ways of promoting the continuation of decennial national censuses while at the same time coming up with

innovative ways to contain or reduce costs without reducing quality, timeliness or output. After going through these papers (presented here as chapters), the reader should be left in no doubt that a census is a mammoth undertaking requiring meticulous planning and execution but reliant on adequate funding if it is to produce the quality information at the level of resolution and disaggregation required for small area and special-topic analyses.

Developed countries have other potential sources of information that, if really necessary, can be used as proxies for census data. By contrast, developing countries rarely, if ever, have comparable sources because of the absence of the well-maintained administrative databases that might be mined for statistical purposes. This makes the conduct of regular, periodic censuses extremely important for national, regional and socio-economic planning in less developed countries both for government and for those national and international agencies that aim to improve the standard of living of the citizens in those countries.

This report is aimed principally at census planners / managers who have the unenviable task not only of being responsible for the planning and execution of their country's national census but of marshalling the campaigns needed to raise the funds required for such an undertaking. This has commonly been a difficult task in most countries contemplating the next census but it is now apparent that, for developing countries, the task has recently become even more challenging.

A secondary target for this report is the local representative of the international donor community to which NSOs go for assistance to help finance their censuses or other surveys. These papers demonstrate to the sympathetic, statistically under-informed potential donor, what is involved in census taking and can assist in understanding the risks involved in supporting such an enterprise, what the NSO is doing to mitigate those risks, and the benefits that will accrue if a census is successfully completed. The report also provides the local representative of the donor community with some ideas for convincing those in the local office that statistical assistance is warranted and worthwhile.

This publication cannot do justice to the contributions of the many participants at these meetings. What it aims to do is to offer a few of the papers presented at the meetings in order to encapsulate the flavour of

the proceedings. In doing so, the report demonstrates the diversity of ideas and approaches available to statistical offices in wrestling with the problems of planning a census, financing it, conducting and processing it, disseminating it and having its data used for many worthwhile national, sub-national, public and private purposes.

This synthesis makes one thing very clear: there is no one way, or approach, to addressing the problems of mounting and financing a census. However, the probabilities of successfully launching and carrying through a census endeavour are greatly enhanced through international cooperation and teamwork, and by building on the efforts of those who have already developed expertise and benefited from experience.

Richard Leete and ***Lalan Mubiala***, in the first paper (**Chapter 1**), explain why censuses are important and why it is essential to replicate them on a regular basis. They also demonstrate that the conduct of a decennial census programme is under threat and exhort the statistical community to come up with innovative new strategies, to continue the census tradition. They also assure national statisticians that they are not alone and that, if they are prepared to be innovative, there are international players that are prepared to help them in their census projects.

Warwick Neville and ***Hasan Abu-Libdeh***, in the second paper (**Chapter 2**), outline the steps that a census manager needs to go through to complete a successful census while controlling costs. These observations and strategies are set in the broader context of issues relating to advocacy, capacity building, and research.

Iqbal Alam (**Chapter 3**), focuses on cost control measures at each stage of the census cycle and makes a case for more deliberate sharing of knowledge and resources through cooperation between developing countries.

The fourth paper (**Chapter 4**), by ***Harry Freedman***, introduces the rolling census concept as a strategy to be shared between countries. This methodology relies on cooperation and sharing so that each country's census can be considered as a component of a series of parallel, but lagged, efforts where the resources are pooled and the earlier parts of the series are training grounds for the following ones. This strategy has been tried by some Caribbean and Pacific nations with some success but needs to be tested in a consortium of larger countries.

The fifth paper (**Chapter 5**), by ***Laurence Lewis***, relates how the Pacific Island Countries, mostly small states distributed over a huge expanse of ocean, have grappled with census taking. For these countries meeting census costs is a particularly acute problem and most of them have recently moved quite rapidly to develop a regional approach.

In the sixth paper (**Chapter 6**) by ***Richard Dackam-Ngatchou***, the author discusses some of the issues specific to the countries of Africa. While there is a clear resonance with the problems of census taking in most developing countries, there is an acuteness to the problem and a frustration to the efforts of those attempting to mount and successfully carry through this task that is less pervasive in most other parts of the world.

The seventh paper (**Chapter 7**), by ***Philippe Pommier***, provides a radical, perhaps even revolutionary departure for dealing with the problems of conducting a census. The traditional view calls for a census to cover a national territory within a very short period of time. Pommier recommends taking a census over a long period, perhaps even ten years, by rolling data collection from region to region throughout the country and placing an emphasis on sample surveys for additional information and as an updating mechanism. The author suggested that Colombia was interested in using this methodology. If it does, the whole statistical community will watch the experiment with interest because of the novel way it levels the workflow and reinforces professional knowledge development and retention.

Finally, in **Chapter 8**, ***Graham Jones*** and ***Laurence Lewis*** address one of the most challenging of current circumstances in which to undertake a census: the post-conflict environments of countries like Afghanistan and Cambodia. To all the problems of the majority of less developed countries must be added the daunting task of operating in a high-risk situation with little supporting infrastructure either in terms of logistics / physical mobility or data collection. The issues are complicated by attempts to implement democratic elections and the risks of contamination that accompany taking a census as the basis for determining the electorate.

A reactive way in which the national and international donor community might respond has already been noted. There is also a proactive way that donors can benefit from this report once they have an appreciation of the mechanics of census taking and how specific action or inaction

affects cost, quality and timeliness. Once a donor has agreed to support a particular census activity there is a need to ensure that subsequent actions and procedures promote positive performance. The chapters of this report illustrate how that can be done. A donor has considerable leverage to nudge NSOs in the right direction. Donor agencies should also try to amend their own procedures when they act as impediments to positive performance.

CHAPTER **1**

THE FUNDING CRISIS IN THE 2000 ROUND OF POPULATION CENSUSES

Richard Leete / Lalan Mubiala

Introduction

For more than three decades UNFPA, working in multiple-partnerships, has played a leadership role in supporting population and housing censuses in developing and transition countries. Many countries across all continents would have been unable to conduct censuses without technical assistance provided by the Fund. This contribution ranges from support for entire censuses, particularly in countries conducting a first modern census, to highly technical elements of census capacity building in other countries. In many countries, censuses have provided the only stocktaking of the population and its characteristics. Without census information, evidence-based population and development planning would not have been possible.

Population censuses are essential for policy and planning purposes. Censuses provide the foundation for good governance and for measuring development progress. They should be held every 10 years as part of a country's strategy for compiling sequenced and integrated information. Funding constraints have seriously affected the 2000 census round, especially in least developed countries: several countries have postponed censuses or are experiencing funding shortages.

A lack of data is not only seriously hampering policy-making and planning across a broad range of sectors in many countries, but also the measurement of progress towards national and international development goals. Developing countries are at differing levels of statistical capability and this is reflected in the quantity and quality of the data

they produce. Several lack financial resources, especially in sub-Saharan Africa and cannot even afford basic computer equipment and software. Limited human resource capacities, especially technical and managerial, compound institutional weaknesses.

The high and growing cost of censuses, coupled with shrinking public sector budgets in many developing countries, has put a serious question mark over their future. Cutbacks in funding for international development assistance, which in the past has been a major source of funding for censuses, has exacerbated the situation. This chapter makes the case for ensuring adequate and timely support for censuses in developing and transition countries lacking sufficient technical and financial resources, and makes proposals for helping to avert a funding crisis in the next round of censuses.

The Value of Censuses

Population-based data and indicators are crucial in four major areas of current concern: for national and sub-national policies and plans; for development frameworks, such as the United Nations' Common Country Assessment (CCAs) and the World Bank (WB) / International Monetary Fund (IMF) Poverty Reduction Strategies Papers (PRSPs); for results based management; and for tracking progress towards the Millennium Development Goals (MDGs). Censuses provide a unique data source for meeting a good proportion of these needs. Combined with sample surveys they can provide the requisite data for most of them.

A census is the primary source of information about the number and characteristics of the population. Its strengths and distinctiveness arise from completeness of coverage; continuity of statistics from census to census; possibilities of inter-relating various characteristics of the population and households; and the details it provides about individuals in local areas and population sub-groups. No other data source meets these needs. And no other data source allows for such a comprehensive gender analysis of population-based indicators. A census also provides the baseline for population and related functional projections that are crucial for sectoral planning. Censuses can provide for comparability of basic development indicators between countries, provided that international definitions and classifications are used.

Data gaps are inevitable in the absence of a recent census. In such circumstances, surveys are obliged to use outdated sampling frames with a likelihood that they will produce seriously skewed estimates. Administrative boundaries will be inaccurately drawn. National, regional, and sectoral planning and related decision-making will be based on outdated and unreliable statistics. Even basic information on population size and age composition will be unavailable or unreliable. Such a lack of basic population data leads to serious policy and resource allocation distortions.

Box 1.1

Population Counts Based on Registers

There is some controversy as to the practicality of this methodology as an alternative to conventional census methods in the collection of comprehensive and quality population and housing data. Anticipation that there could be widespread adoption of this method in the foreseeable future seems improbable and, it has been suggested, is based on a series of myths in the belief that:

- ***register-based censuses are cheap:*** establishment and maintenance of registers is very expensive; the process of deriving statistics from those existing registers is relatively cheap;
- ***suitable registers will become available:*** registers have not been designed to provide demographic information and there compilation and use for this purpose is, in some instances, likely to run contrary to privacy considerations and identification of individuals on the basis of certain social or cultural characteristics;
- ***registers are capable of providing the full-range of quality data:*** as administrative records, registers are maintained only at a level of quality sufficient to satisfy their primary purpose rather than as a supportive database for statisticians;
- ***users of conventional census methods have not seriously considered the use of registers as a viable alternative:*** many countries have considered the use of such data and in practice rely on certain categories of information for making their intercensal estimates; it is salutary to note, however, that such estimates are commonly heavily revised when the results of the full conventional census emerge.

With all their faults, conventional censuses provide a benchmark that in only rare cases could be replaced satisfactorily by other sources. Nevertheless, registers can be expected to play an increasingly important part as supplements to traditional sources. The computerisation of public sector and administrative data has made it much more feasible than before to use such sources for statistical purposes.

SOURCE: Based on Griffin (n.d.).

Population information based on household registers is viable for countries that have established registers, as in parts of Europe, for example (**Box 1.1**). But the costs of establishing and maintaining household registers are such that they preclude the use of this option in developing countries for the foreseeable future.

The 2000 Round of Censuses

The United Nations Statistical Commission, ECOSOC, in resolution 1995/7, recommended that all Member States carry out population censuses during the period 1995-2004. Now, approaching the end-point of this period, it is apparent that the implementation of the 2000 round of censuses does not compare favourably with that of the 1990 round (**Table 1.1**).

Several countries, especially in sub-Saharan Africa, have postponed their censuses, thereby increasing the time interval since the previous census to more than 10 years (**Box 1.2**). Other countries have secured funding at a very late stage in their census preparations, thereby forcing compromises in decision making and execution, while yet others are experiencing funding gaps that are slowing post-enumeration activities and curtailing plans for the dissemination of census results. Funding delays and uncertainty almost inevitably lead to delays in data processing and affect the range and quality of census results.

In most developing countries and countries in transition, a census is financed in part by the national government with the balance provided by assistance from the international community.

Box 1.2

Sub-Saharan African Countries Censuses with Intervals Exceeding Ten years

Census interval 11 to 12 years (actual or expected):

Burkina Faso; Ghana, Malawi, Mali, Nigeria, Rwanda and Uganda

Census interval 13 + years (actual or expected):

Angola, Cameroon, Central African Republic, Mauritania, Niger, Senegal, Sierra Leone and Tanzania

Sometimes governments tend to allocate unrealistically low amounts for censuses with the expectation that international assistance will provide the balance. Many countries organise donors' meetings for this purpose, and the outcome is not always successful. Meanwhile the census time-schedule continues to move forward. Experience shows that governments and donor agencies often allocate funds just prior to the actual enumeration. This statistical brinksmanship may lead to compromises in the decision-making process and negatively impact the quality of census operations. For best results, allocations of the necessary resources for a census should be made well in advance of the census moment.

Box 1.3

Ingredients of Cambodia's Successful 1998 Population Census

In 1998 Cambodia held its first population census since 1962. Despite the difficult political conditions prevailing at that time, the relatively weak state of communications, infrastructure and the need to mobilise and train a field force of some 25,000 enumerators and 8,000 supervisors from a low-skill base, the census was a remarkable success. Key contributing factors were:

Project findings:

- strong commitment at all levels of government;
- strong collaboration and coordination between the government, donors and United Nations organisations, led by UNFPA, in the provision of technical, financial and logistical support;
- a well targeted census advocacy campaign that increased awareness and gained widespread support for the census at all leadership levels;
- dissemination of positive messages about the census to the Cambodian people through mass media campaigns.

The census results provide important population, social and economic data for the preparation of the national development plan and serve as a baseline for monitoring the international development goals. The census experience also helped to build capacity of the national census and statistical office in, inter alia, technical and managerial skills and by the provision of data processing equipment.

The international community recognises that many developing countries lack the financial and human resource capacity to conduct censuses without at least some technical assistance. Even the countries with economies in transition face constraints in carrying out censuses due, for example, to collapses in institutional infrastructures and an inability to give priority to censuses amid competing demands on resources. Thus the recommendations of the 1999 United Nations' Special Session of the General Assembly on the five-year review and appraisal of the Programme of Action of the International Conference on Population and Development (ICPD) called for the United Nations and donors to strengthen the capacity of developing countries, particularly the least developed countries and those with economies in transition, to undertake censuses and surveys on a regular basis. But with rising costs of censuses there appears to be some donor fatigue in meeting gaps in census funding.

Almost all developing countries have had some experience in census taking during the past several decades. But staff turnover during the long interval between censuses, coupled with inadequate documentation of what happened, or poor documentation retention, often meant that previous censuses are of limited relevance. This may, in part, be overcome by the judicious use of new developments and accumulated experiences in census operations and state-of-the-art microcomputer technology. If the skills are there to use these resources effectively, they will do much to reduce cost and maximise the utility of the information.

The United Nations Statistical Division (UNSD) has helped create a strong normative basis for census taking through its manuals, handbooks and, with the US Census Bureau, census software. For example, publication of the *Principles and Recommendations for Population and Housing Censuses, Revision 1, 1998*, provides countries with guidance on the use of new developments and techniques, as well as accumulated knowledge and experiences of census operations. **Box 1.3** outlines a successfully organised census with well-coordinated international collaboration led by the UNFPA.

Rising Costs of Censuses and Cost-Saving Strategies

Censuses are the largest, most elaborate and costly data collection activity that Statistical Offices undertake, and costs are rising. In many countries a census constitutes approximately 10-15 per cent of the budget of

Statistical Offices over an entire decade. One factor contributing to the increase in census costs in developing countries is relatively high population growth. In many, annual population growth exceeds two per cent per annum implying an increase in population size of at least one-third over a normal ten-year census period. Another is that labour-saving and time-reducing technology comes with a hefty price tag. Even in industrialised countries, *per capita* census costs are rising, despite the use of mail-out and mail-back questionnaires, sophisticated computer data processing technology and relatively small annual population growth. For example, the United States population census for the year 2000 is estimated to have cost $4.5 billion, or $16 per head, compared with a figure of around $10 per head in 1990 (Kent et al., 2001).

Rising costs of censuses, coupled with a lack of detailed data about census costs, led the United Nations in its *Recommendation for Population and Housing Censuses*, to emphasise the need for countries to keep account of the cost of each census activity. Summary cost indicators, such as total census cost per capita, are subject to limitations that make it difficult to say that one census is more or less expensive than another. They do not take account of variations in the quality, quantity and timeliness of census results.

Censuses need to be more cost effective. But they will remain costly despite the use of modern, relatively low-cost, computer technology. There is a fine balance between keeping census costs to a minimum and preserving the unique advantages of a census. UNFPA has found that unless sufficient resources are available at each stage of the census the quality of the entire census can be jeopardized. Three activities tend to constitute the bulk of census operation costs.

First, *census maps.* Accurate maps provide the basis for a variety of census operations, including setting enumerator assignments, ensuring completeness of coverage, estimating travel time and costs, and establishing field offices. The use of GIS, with ground-truthing, can lead to significant cost savings in the determination of enumeration areas. Further, the continuous and multiple use of maps by, and across, different government departments can help spread cartographic costs. Continuous use, with on-going updating, also helps maintain the currency of the maps.

Second, *population enumeration.* This is the most expensive census operation. Each individual, and living quarter in a country must be enumerated within a short period of time. Enumeration costs depend upon factors such as method of enumeration; the source of supply of enumerators and the number of questions asked in the census questionnaire. Sampling of common characteristics can reduce census enumeration and processing costs, and improve the quality of information. Sampling during enumeration reduces the field, training and processing costs of the main census, and enhances the quality of the additional data collected from a sub-sample of households. However, considerable care needs to be taken in sample selection and implementation to avoid biases in the results.

Third, *data capture, processing, analysis, and dissemination.* Continued advances in computer systems technology, such as electronic scanning of marks and characters have greatly increased the speed and reliability in producing and disseminating tabulations, making automation the standard method of processing. However, modern high-level data processing technology, and the skills to handle it, are frequently in short supply in developing countries. Furthermore, it is by no means self-evident in labour surplus situations that such technology should necessarily be chosen to replace personal computers. Although avoiding human transcription errors, such as data misreading or mispunching, the technology may have limited usefulness in the years following a census. By contrast, a large number of personal computers and related equipment brought to facilitate census data processing may help permanently upgrade institutional capacity.

Even among countries with a well-established record of census taking, there is no clear consensus on the most efficient or cost-effective methods to be adopted. For example, censuses in the UNECE region and beyond to central Asia and North America display many similarities but also significant differences. Some of these differences can be explained by local circumstances or conventions, but many cannot (Griffin, 1999). The time is ripe to consider cost-saving strategies beyond census sampling. These strategies might include: coordinating international census data requirements; sharing of experiences between countries; and sharing of selected census activities among groups of neighbouring countries with similar data needs. Sharing of selected census activities might include: selection of a common census year; joint development of

absolute minimum core questionnaires; and the sharing of questionnaires, manuals, training, data processing, analysis and dissemination activities.

UNFPA has supported the adoption of these strategies for countries in the Pacific region, Central Asian countries, and parts of Africa since 1999 through the Southern Africa Development Community (SADC). Successful implementation of these measures requires strong political commitment from the countries concerned. It also requires considerable technical support from the international donor community. UNFPA, in collaboration with other partners, has supported a number of workshops to promote this strategy.

International Support for Censuses

Technical cooperation and assistance from multilateral agencies, led by UNFPA, and from bilateral donors, have played a major role in the success of past censuses. Given the limited budgets available to many Statistical Offices and their limited capacity, there is a continuing need for such cooperation and assistance, particularly in the poorest countries in sub-Saharan Africa. New sources of funding will need to be tapped, including greater involvement of Foundations and the private sector. Yet both from a supply and a demand perspective, census data largely constitute a public good. So for the foreseeable future, international technical and, to a limited extent, financial assistance for census taking (including from the World Bank and regional development banks) will be required to complement national inputs.

For more than three decades UNFPA has played a leadership role in supporting census programmes in developing and transition countries. The Fund has also been prominent in helping to mobilise support for censuses in post-conflict situations where previous census data may no longer be relevant – as, for example, in Cambodia, Kosovo and Afghanistan (see Chapter 8). Many countries would have been unable to conduct censuses without such assistance. However, with competing demands on its limited resources, coupled with reductions in core income over the past five years, supporting countries census-taking activities has become ever-more difficult. The Fund's policy has been to try to limit support to countries taking their first or second census. But this is insufficient in many developing and transition countries where there is lack of resources and capacity. A particular problem facing transition countries is the lack of familiarity with international standards.

UNFPA continues to play a pivotal role in helping mobilise resources for censuses in most developing countries, in conjunction with multiple partnerships, donors and technical assistance organizations, such as the PARIS21, European Union, USAID, the World Bank and others. Promoting awareness and disseminating knowledge of the current status of technology and its applications in a timely fashion has been an important contribution, as in the case of the NIDI/UNFPA meeting of experts on innovative techniques in the run up to the 2000 round of censuses (NIDI and UNFPA, 1996). The Fund also plays a key role in the six-monthly meetings of the Interagency Census Coordinating Committee (ICCC) for sub-Saharan Africa which is attended by representatives from UNFPA, UNSD, USAID, the US Bureau of the Census, CIDA (Canada), and the World Bank.

Donors are conscious of the critical need for census data for many purposes and of the consequences of not having such data (UNFPA, 2000). Yet there is a sometimes donor fatigue at the idea of having to support yet another census, particularly when the donor support has been given to a particular country for several previous censuses. The amounts requested from donors are relatively large in relation to their budget allocations for particular countries. Often requests to donors for support for their censuses are received late and the budget is overly ambitious. Developing countries need the requisite skills to negotiate with, and coordinate, a large number of donors. They also need to make an early start in trying to bridge the budget gap between resources available from the government and estimated census costs.

There is a need to redefine negotiating positions whereby

- governments start too high;
- donors are reluctant to commit before the size of the government commitment is known (each side waits for the other);
- donors are reluctant to commit funds for necessary pre-enumeration preparatory work for fear it will be wasted.

Moreover, guidelines on what donors are prepared to fund can give rise to costing distortions and inefficiencies. Thus some donors will support the purchase of expensive technology but decline to meet any of the local costs of a census.

Technical cooperation and assistance from international agencies and the donor community have played a major role in the success of past censuses. There will be a continuing need by many countries, particularly the poorest countries, for such assistance in future censuses. Pooling of international agency and donor resources could be a cost-effective strategy for meeting the diverse demands expected in these censuses.

Conclusion

Censuses will continue to be a unique source of data for policy dialogue, setting and monitoring development goals and for poverty reduction strategies. In order to avert a funding crisis and ensure their future stability there is a need to:

- conduct research into census costs and operational methods to determine what practical measures can be taken to reduce costs, as well as how to maximise the timely dissemination and use of census results;
- assist countries in advocating the need for conducting censuses at regular intervals and securing the necessary funding within countries, and across the donor community. Much more needs to be done by line ministries to support the efforts of national statistical offices in making the case to finance ministries for supporting national censuses.

Similarly, international agencies that use national census data for a variety of purposes could help support the case of UNFPA to convince bilateral and multilateral donors to provide support for censuses. In any case, UNFPA, working in partnerships with others and building on comparative advantages, will continue to play a leadership role in support of these aims.

TABLE 1.1: Population Censuses Held and Planned in the 1990 and 2000 Rounds

AFRICA

Country	1990 Census Round 1985-94	2000 Census Round 1995-04
Algeria	03/87	06/98
Angola	-	**2004**
Benin	02/92	02/02
Botswana	**08/91**	**08/01**
Burkina Faso	12/85	12/96
Burundi	**08/90**	-
Cameroon	04/87	12/02
Cape Verde	**06/90**	**06/00**
Central African Rep.	12/88	06/03
Chad	**04/93**	**2003**
Comoros	09/91	09/02
Congo	**11/84**	**07/00**
Cote d'Ivoire	03/88	11/98
DR of Congo	**07/84**	**2003**
Djibouti	-	2003
Egypt	**11/86**	**11/96**
Equatorial Guinea	07/94	02/02
Eritrea	-	**12/03**
Ethiopia	10/94	05/04
Gabon	**07/93**	**2003**
Gambia	04/93	04/03
Ghana	-	**03/00**
Guinea	-	12/96
Guinea Bissau	**12/91**	-
Kenya	08/89	08/99
Lesotho	**04/86**	**04/96**
		05/01
Liberia	-	10/03
Lybia Arab Jamahiriya	-	**08/95**
Madagascar	08/93	09/03
Malawi	**09/87**	**09/98**
Mali	04/87	04/98
Mauritania	**04/88**	**11/00**
Mauritius	07/90	07/00
Morocco	**09/94**	-
Mozambique	-	08/97
Namibia	**10/91**	**09/01**
Niger	05/88	05/01
Nigeria	**11/91**	**11/02**

AFRICA continued

Country	1990 Census Round 1985-94	2000 Census Round 1995-04
Reunion	03/90	03/99
Rwanda	**08/91**	**08/02**
St. Helena	02/87	03/98
Sao Tome and Principe	**08/91**	**08/01**
Senegal	05/88	11/01
Seychelles	**08/87**	**08/97**
	08/94	**08/02**
Sierra Leone	12/85	01/03
Somalia	**02/87**	-
South Africa	03/85	10/96
	03/91	10/01
Sudan	**04/93**	**2003**
Swaziland	08/86	05/97
Togo	**11/93**	**11/02**
Tunisia	04/94	2004
Uganda	**01/91**	**08/02**
United Rep. of Tanzania	08/88	08/02
Western Sahara	**09/94**	-
Zambia	08/90	10/00
Zimbabwe	**08/92**	**08/02**

AMERICA, NORTH

Anguilla	**04/92**	**05/01**
Antigua and Barbuda	05/91	05/01
Aruba	**10/91**	**10/00**
Bahamas	05/90	05/01
Barbados	**05/90**	**05/00**
Belize	05/91	05/00
Bermuda	**05/91**	**05/00**
British Virgin Islands	05/91	05/01
Canada	**06/86**	**05/96**
	06/91	**05/01**
Cayman Islands	10/89	-
Costa Rica	-	**06/00**
Cuba	-	-
Dominica	**05/91**	**05/01**
Dominican Republic	09/93	11/01
El Salvador	**09/92**	-
Greenland	-	-
Grenada	**05/91**	**05/01**
Guadeloupe	03/90	03/99

AMERICA, NORTH continued

Country	1990 Census Round 1985-94	2000 Census Round 1995-04
Guatemala	**04/94**	**2003**
Haiti	-	09/01
Honduras	**05/88**	**07/00**
Jamaica	04/91	09/01
Martinique	**03/90**	**03/99**
Mexico	03/90	02/00
Montserrat	**05/91**	**05/01**
Netherlands Antilles	01/92	01/01
Nicaragua	-	**04/95**
Panama	05/90	05/00
Puerto Rico	**04/90**	**04/00**
St. Kitts and Nevis	05/91	05/01
St. Lucia	**05/91**	**05/01**
St. Pierre and Miquelon	05/90	1999
St. Vincent and the Grenadines	**05/91**	**05/01**
Trinidad and Tobago	05/90	05/00
Turks and Caicos Islands	**05/90**	**08/01**
United States of America	04/90	04/00
United States Virgin Islands	**04/90**	**04/00**

AMERICA, SOUTH

Argentina	04/91	11/01
Bolivia	**06/92**	**09/01**
Brazil	09/91	08/96
		08/00
Chile	**04/92**	**04/02**
Colombia	10/85	10/03
	10/93	
Ecuador	**11/90**	**11/01**
Falkland Islands (Malvinas)	11/86	04/96
	03/91	04/01
French Guiana	**03/90**	**03/99**
Guyana	05/91	05/02
Paraguay	**08/92**	-
Peru	07/93	2003
Suriname	-	**01/03**
Uruguay	10/85	05/96
Venezuela	**10/90**	**10/01**

ASIA

Country	1990 Census Round 1985-94	2000 Census Round 1995-04
Afghanistan	-	2003
Armenia	**01/89**	**10/01**
Azerbaijan	01/89	01/99
Bahrain	**11/91**	**2001**
Bangladesh	03/91	01/01
Bhutan	-	-
Brunei	08/91	05/01
Cambodia	Not held	**03/98**
China	07/90	11/00
China, Hong Kong SAR	**03/86**	**03/96**
	03/91	**03/01**
China, Macao SAR	08/91	-
Cyprus	**10/92**	**10/01**
East Timor	10/90	2003
Georgia	**01/89**	**01/02**
India	03/91	03/01
Indonesia	**10/90**	**06/00**
Iran Islamic Rep. of	09/86	09/96
	12/91	-
Iraq	**10/87**	**10/97**
Japan	10/85	10/95
		10/00
Jordan	**12/94**	**2004**
Kazakhstan	01/89	02/99
DPR of Korea	**12/93**	-
Rep. of Korea	11/85	11/95
	11/90	11/00
Kuwait	**04/85**	**04/95**
Kyrgyzstan	01/89	03/99
Lao People's Dem. Rep.	**03/85**	**03/95**
Lebanon	-	-
Malaysia	**08/91**	**07/00**
Maldives	03/85	03/95
	03/90	03/00
Mongolia	**01/89**	**01/00**
Myanmar	-	2004
Nepal	**06/91**	**06/01**
Occupied Palestinian Territory	-	12/97
Oman	**12/93**	**12/03**
Pakistan	-	03/98

ASIA continued

Country	1990 Census Round 1985-94	2000 Census Round 1995-04
Philippines	**05/90**	**09/95**
		05/00
Qatar	03/86	03/97
Saudi Arabia	**09/92**	-
Singapore	06/90	06/00
Sri Lanka	-	**07/01**
Syrian Arab Republic	09/94	2004
Tajikstan	**01/89**	**01/00**
Thailand	04/90	04/00
Turkey	**10/85**	**10/97**
	10/90	**10/00**
Turkmenistan	01/89	01/95
		01/04
United Arab Emirates	**12/85**	**12/95**
Uzbekistan	01/89	-
Viet Nam	**04/89**	**04/99**
Yemen	12/94	2004

EUROPE

Albania	**04/89**	**04/01**
Andorra	-	-
Austria	**05/91**	**05/01**
Belarus	01/89	02/99
Belgium	**03/91**	**03/01**
Bosnia Herzegovina	03/91	03/01
Bulgaria	**12/85**	**03/01**
	12/92	
Channel Islands	03/86	03/96
	03/91	04/01
Croatia	**03/91**	**03/01**
Czech Republic	03/91	03/01
Denmark	**01/91**	**01/01**
Estonia	01/89	03/00
Faeroe Islands	-	-
Finland	11/85	12/95
	12/90	12/00
France	**03/90**	**03/99**
Germany		04/02
Germany, Democratic Republic of	**1991**	-
Germany, Federal Republic of	05/87	-

EUROPE continued

Country	1990 Census Round 1985-94	2000 Census Round 1995-04
Gibraltar	10/91	-
Greece	**03/91**	**04/01**
Hungary	01/90	02/01
Iceland	-	**03/01**
Ireland	04/86	04/96
	04/91	04/02
Isle of Man	**04/86**	**04/96**
	04/91	**04/01**
Italy	10/91	10/01
Latvia	**01/89**	**03/00**
Liechtenstein	12/90	12/00
Lithuania	**01/89**	**04/01**
Luxembourg	03/91	**02/01**
Malta	**11/85**	**11/95**
Monaco	07/90	-
Netherlands	**01/91**	**01/01**
Norway	**11/90**	11/01
Poland	**12/88**	**05/02**
Portugal	04/91	**03/01**
Republic of Moldova	01/89	-
Romania	01/92	03/02
Russian Federation	**01/89**	**10/02**
San Marino	-	-
Slovakia	**03/91**	**05/01**
Slovenia	03/91	03/02
Spain	**03/91**	**10/01**
Svalbard and Jan Mayen Islands	-	-
Sweden	**11/85**	-
	11/90	
Switzerland	12/90	12/00
Frmr Yugoslav Rep Macedonia	**03/91**	**11/02**
	06/94	
Ukraine	01/89	12/01
United Kingdom	**04/91**	**04/01**
Yugoslavia		
Montenegro	**03/91**	-
Serbia	03/91	04/02

OCEANIA

Country	1990 Census Round 1985-94	2000 Census Round 1995-04
American Samoa	04/90	04/00
Australia	**06/86**	**08/96**
	06/91	**08/01**
Cook Islands	12/86	12/96
	12/91	2001
Fiji	**08/86**	**08/96**
French Polynesia	09/88	09/96
Guam	**04/90**	**04/00**
Kiribati	05/85	11/95
	11/90	11/00
Marshall Islands	**11/88**	**06/99**
Micronesia, Federated States	09/04	04/00
Nauru	**1992**	**09/02**
New Caledonia	04/89	04/96
		08/03
New Zealand	**03/86**	**03/96**
	03/91	**03/01**
Niue	09/86	**08/97**
	11/91	
Norfolk Island	**06/86**	**06/96**
	08/91	-
Northern Mariana Islands	04/90	09/95
		04/00
Palau	**03/86**	**09/95**
	04/90	**04/00**
Papua New Guinea	07/90	07/00
Pitcairn	**1991**	-
Samoa	11/86	11/01
	11/91	
Solomon Islands	**11/86**	**11/99**
Tokelau	1986	-
	11/91	
Tonga	**11/86**	**11/96**
Tuvalu	06/85	11/02
	11/91	
Vanuatu	**01/86**	**11/99**
	05/89	
Wallis and Futuna Islands	12/90	10/96
		2003

SOURCE: Cited from UNFPA PDS #4. Current update based on http://www.census.gov/ipc/www/cendates

CHAPTER **2**

CENSUS ENUMERATION: CONTAINING COSTS WHILE ENHANCING EFFICACY

Warwick Neville / Hasan Abu-Libdeh

Background

The UNFPA/PARIS21 International Expert Group Meeting on *Mechanisms for Ensuring Continuity of 10-Year Population Censuses: Strategies for Reducing Census Costs* met in Pretoria, South Africa, 26-29 November, 2001. This meeting, attended by country representatives, donors and multilateral agencies, identified a number of common problems, many of which stem from funding deficiencies.

In some countries, lack of resources has meant that no censuses at all have been taken recently, if ever. Such countries are likely to face immense problems in ensuring the effective functioning of many of their democratic institutions. They will also be obliged to confront a lack of population-based data for formulation of national and local policies and plans, and for monitoring progress towards national and international development goals.

For the majority of developing countries represented at the meeting, censuses had been undertaken recently. However, the census-taking and census-using processes are beset by problems such as skill shortages and other capacity constraints, insufficient analysis, poor dissemination and less-than-optimal use of census results.

In most instances where census taking has occurred or is likely to occur in the near future, a primary requirement is to improve the efficiency of census enumeration without compromising the quality of the census data. Methods need to be identified and implemented to achieve reduc-

tions in census costs without subverting the objectives of census taking. Especially critical in this context is the assurance of completeness of coverage and maintenance of the reliability of the information collected.

Cost-effective strategies need to be developed in the broader context of the economic and social benefits that can accrue from more efficient planning and performance in both the public and private sectors. The costs of enumeration, when spread over a ten-year period, are only a very small proportion of overall government budgets, yet the information derived from the census can achieve substantial savings and greatly enhance efficiency.

As a consequence of this diversity of applications of census information, multidisciplinary perspectives and approaches need to be adopted when planning, conducting and supporting the use of a census. But in addition to responding to the immediacy of these demands, pragmatism dictates a judicious melding of these priorities with the views and requirements of stakeholders. This inclusive type of approach broadens ownership of the census and builds alliances capable of providing the requisite advocacy for mobilising essential resources.

Box 2.1

The Central Role of a Reliable Population Database

The process of census taking and processing needs to be fully integrated within national statistical systems rather than being isolated as a stand-alone operation. Furthermore, while census information is integral to the administrative functions of government, it should also be viewed as an essential tool for developing strategies to identify and meet the needs of the poor. Without a comprehensive population database it is virtually impossible to systematically develop, and effectively implement, programmes to reduce poverty in all its multifaceted dimensions.

As countries approach the next census round, 2005-2014, there is a window of opportunity for exploring systematically, and in detail, some of the concerns and ideas raised, and of carrying these forward towards a better understanding and, where practicable, a positive resolution. Similarly, there is scope for making an assessment of the utility that cur-

rent and prospective changes in technology might have on census enumeration and analysis and what the longer-term impact might be on accepted best practice.

Focus on the Future

The census constitutes the most widely accepted of the major tools for collecting fundamental and comprehensive demographic data, outstripping registration and sample surveys in its applicability and reliability in statistically unsophisticated environments or otherwise difficult circumstances such as low levels of literacy. Looking towards the next few decades, the census can reasonably be presented as an essential global tool for demographic stocktaking and socio-economic development.

The modern version of the conventional census has long had its staunch advocates, as a review of the relevant literature demonstrates. Nevertheless, even in past decades when there was a fair degree of unanimity among more developed countries with the resources to mount a decennial census, many permutations and variations in methodology as well as content, characterised the process. Demographers even then, as now, were constantly reassessing the situation, not only attempting to stay abreast of trends in technology and their applications to the census process but also seeking conceptual and methodological alternatives. For example, one such study, by Philip Redfern (1987), outlines in some detail the merits and demerits of the conventional census, makes comparisons among fourteen European countries plus the United States and with the register-based census, and then details the main features of each of the fifteen censuses. The study raises many of the issues still being contended with early in the new millennium.

While it is desirable to consider modified or alternative forms of basic population data collection in the longer term, right now there are more pressing issues. For the immediate future, a strategy of developing common procedures, training, expanding a significant core of skilled census practitioners and facilitating regional cooperation and mutual support, offers the most cost effective benefits for the majority of developing countries. The objectives of comprehensive spatial coverage, complete population response, rigorous analysis and quality output must therefore become as universally accepted and achieved as possible, and all reasonable means harnessed to ensure these outcomes. With this broad aim in view, the following essential concepts are proposed as offering feasible pathways along which to move forward.

Essential Concepts

Four major conceptual approaches have been identified as the focus for further steps to enhance the efficiency and cost effectiveness of the range of processes associated with census taking. The concepts are ***advocacy, capacity building, research*** and ***strategies***. While these terms convey fairly specific areas for advancement, each carries connotations and implications for a range of contexts and at varying levels of intervention. Thus, for example, while advocacy is perceived as dealing primarily with persuading governments and donors of the efficacy of the census and the desirability of its implementation, there are also operational aspects for which advocacy is desirable if statistical offices are to participate fully and proactively in mounting a census. The same is true of the other concepts.

In the outline which follows, there is a brief assessment of the broad context in which each concept needs to be considered, followed by a set of issues which focus on a number of different facets requiring to be addressed. There is a certain amount of overlap between the four sections as specific issues can be dealt with by appropriate action in more than a single conceptual context.

Advocacy

The context

Anywhere in the world, census taking is a major and costly procedure. For many developing countries with a vast array of needs all competing for limited resources, census taking has been placed low down on the list of priorities commanding attention, particularly in terms of the allocation of financial resources. This phenomenon has often been paralleled by shrinking contributions from bilateral and multilateral donors as they re-evaluate their goals, priorities and programmes of financial support. One way and another, given the enormity of the census-taking task in itself and the obstacles to a successful outcome from a comprehensive census-taking exercise, many governments and donors alike tend to discount the benefits of a census relative to the cost and other pressures it will exert on available resources.

Stakeholder groups, in turn, are to be encouraged to undertake an advocacy role in the particular areas in which they are capable of being most informative and persuasive. Such a tactic may require stakeholders to develop and strengthen strategies to overcome indifference or negative

Box 2.2

Stakeholders Are Both Advisers and Beneficiaries

Raising awareness of the benefits of the census, what is involved in conducting a census, how it can be funded and the long-term spin-offs for benefiting the economy and society constitute a necessary starting point in many instances. This necessitates the systematic identifying, approaching and involving of the main stakeholders at a very early stage in the process. Governments, parliamentarians, bureaucrats, community leaders, and the multiplicity of potential public and private sector users of census data need to be consulted and convinced of the efficacy and necessity of the census as a tool for policy development and/or its implementation.

attitudes that deplore the cost, the diversion of expertise and the long-term commitment required to achieve satisfactory completion of the whole census process. Leaders at the highest levels of policy development and decision making must be persuaded to speak out and act in support. In particular, governments and the bureaucrats involved, together with the United Nations system, must convince potential donors of the credibility and viability of any given national statistical office succeeding in this enterprise.

Explicitly identifying the nature and range of data to be collected and its potential applications is likely to be an integral component in mounting an effective argument for support. Even censuses which aim to confine themselves just to core data collection can throw a great deal of light on the location and composition of the population in terms of family structure, age-sex distribution, characteristics of the labour force and significant social characteristics. Variables such as these provide the basic information to analyse and understand fundamental economic and social issues of society, and the dimension and scale of the remedies required to improve and promote areas of concern like education, employment, poverty eradication and housing provision.

Population and development are intrinsically interrelated, and a more comprehensive knowledge and understanding of the demographic profile of the population provides the essential ingredients for implementation of any effective development programme.

The issues relating to advocacy

Targeting

- carefully identify the main actors (governments and/or agencies, donors, regional and international agencies) and target their key decision makers.

Stakeholder involvement

- consult stakeholders / users;
- encourage national statistical offices (NSOs) to demonstrate the utility of available census data to stakeholders;
- satisfied stakeholders are effective advocates for funding / quality / continuity;
- the backing of stakeholders further legitimises the census process.

Government participation

- raise the political awareness of the census as a tool of economic and social policy formulation and implementation;
- demonstrate the utility of census data and the authority of quality census results;
- convince governments / agencies of the fundamental role of census information in the identification of the distribution of social phenomena (e.g., poverty) through society and around the country;
- demonstrate the implied costs of attempting to develop policies and implement (e.g., poverty) programmes without a census-derived data base;
- encourage dedicated and reliably available budget allocations to see the census process through all stages to completion (including publication / dissemination).

Donor response

- enhance linkages between sponsors/donors and recipients/clients;
- encourage feedback / approval of donors in response to quality performance;
- make use of the fact that the recognition and approval of donors further enhances strong advocacy.

Accompanying action

- provide options for dealing with issues to ensure past short-comings (inadequate processing, nil or incomplete publication of data etc) are overcome and do not negate the value of a census in the eyes of government, donors and others;

- cooperate with the PARIS21 Census Task Team to achieve effective and widespread advocacy measures;
- customise advocacy materials to accommodate country/cultural sensitivities;
- mobilise new resources for capacity building.

Capacity building

The context

As noted in the introduction to the concepts being promoted in this chapter, each carries connotations and implications for a range of contexts and levels of intervention. In the case of capacity building, this concept can be described either from an input or from an output perspective vis-à-vis the production of census information (United Nations Economic and Social Council, 2001). In the input perspective, the focus is on capability, that is, those factors that are needed for the production process such as the institutional milieu and human and capital resources. The output perspective concerns the realised capacity which can be described in terms of a country's quantity and quality of census-based output and census-based postcensal survey activity.

The input perspective offers the more obvious opportunities for national and international capacity building. There are several major elements requiring consideration. The first of these is the institutional milieu. Since only a government can be expected to undertake such a massive task as the national census, the public sector structure and the legal system underpinning it are of prime concern. While such specific items as remuneration levels and career paths may appear to be of more immediate consequence, this set of issues ultimately comes down to the existence of a supportive education system and adequate training facilities to achieve the requisite expertise.

Secondly, physical resources such as buildings, equipment, financial resources and other less tangible assets (e.g., appropriate software) are important elements of knowledge management. Thirdly, adequate human resources in terms of sheer numbers are as essential as executive expertise. Fourthly, the human knowledge resources themselves embody the most critical element of technical expertise requiring both theoretical and pragmatic skills. Finally, management resources and leadership are essential to ensure the realisation of the potential implied by the available capacity.

The following sub-section identifies some of the elements involved in capacity building and further develops points arising in this context from the recommendations and 'next step' findings of the Expert Group Meeting in Pretoria. The issues are couched in terms of positive steps that need to be taken in the process of advancement in capacity and competencies in census taking across the broad spectrum of the activities involved. The sub-section also introduces the notion of 'virtual capacity building' which envisages enhancement of national capacity by drawing on external resources, knowledge and best-practice information with little if any additional cost to the statistical office concerned.

The issues relating to capacity building

Virtual capacity building

- encourage capacity building at the regional level with cooperative, cost-saving measures for mutual sharing in training programmes, resources, best-practice information and census data exchange;
- facilitate creation of a census bulletin board to advise of surplus capacity or request support and to exchange census news between practitioners / countries.

A national statistical office

- establish / maintain an integrated, permanent national statistical system to provide the on-going organisational framework within which the census can be mounted on a regular basis;
- promote the role of a permanent national statistical system to build sustainable capacity and institutional memory (monitoring / archiving).

Planning

- ensure a capability for forward planning and integration with other NSO activities and schedules;
- implement early, comprehensive planning to ensure an accurate and cost effective census process;
- retain a permanent core of technical expertise and training capability;
- establish linkages between all the major components of the census (questionnaire design, enumeration, data processing, analysis);
- adopt appropriate levels of new technologies, improved statistical methods and training of personnel.

Managing

- reduce wastage (e.g., retraining of large temporary staff) and smooth the workload / work schedule by maintaining a small core of experienced employees operating throughout the intercensal period;
- maintain the capacity to complete the whole census process including such components as analysis, dissemination, storage / archiving;
- train and/or designate able people as managers in all key areas of operation including finance;
- ensure that managers meet frequently and implement optimal use of the existing capacity.

Research

The context

Systematic research provides the most effective mechanism for addressing and resolving the complex issues associated with taking a census. An integral part of that process entails identifying means of achieving cost reductions and greater operational efficiency. Much of the received wisdom disseminated in published form and based on long experience in more developed countries has built-in assumptions about administrative systems, resourcing and population responsiveness that do not apply in many developing societies.

An understanding of contextual problems and ways of operating to overcome severe constraints on the collection and recording of census information is fundamental. These include incomplete mapping of enumerator districts and related land registry information; high illiteracy rates throughout the population; poor communications by road and telephone; high levels of population mobility; and the complexities of achieving comprehensive coverage in high density urban housing and low density dispersed rural populations. Research on methods for coping with these varied and difficult circumstances can contribute to improved and cost-effective solutions to the problems posed. Comparative research, in which the experience of other countries in the same region or similar circumstances is systematically assembled, may expedite appropriate decisions elsewhere particularly if there is a strong basis for assuring the transferability of approaches, methods or systems.

Planning and administering the census constitutes another set of issues on which research can advantageously be focused. These are issues that arise from the central operational aspects of the census including

recruitment and training of personnel; accessing the requisite expertise, and deploying such people in sufficient numbers; and development of systems to manage questionnaire development, data capture, data retrieval, data processing and the like.

Funding, particularly in the context of developing strong and on-going links with donors, constitutes a central element in mounting a census and research-based guidance would provide inexperienced statistical office directors and their fundraisers with information needed in the lead up to census planning and implementation. This might comprise a systematic and on-going review of the best options and opportunities for gaining donor support; of the attributes of an acceptable census funding proposal and expectations that funding agencies generally require of their successful clients; and of the obligations that may be incurred in any particular instance.

Whilst issues requiring investigation are likely to derive from the expressed needs of national statistical offices and stakeholders, initiatives for the funding and implementation of research are likely to originate almost entirely with international agencies, donor organisations and professional researchers. Appropriate means of consulting the stakeholders are required in order to create the environment in which the most pressing themes for research can be canvassed and incorporated in the research programmes themselves.

Box 2.3

Adopting the Appropriate Technology to Achieve the Optimal Outputs

A major concern for the effective carrying out of a census is the adoption of the appropriate level of technology and related support systems. Awareness of new technologies and their capabilities is desirable but adoption of appropriate technology is even more essential. Research that provides a guide and recommends the appropriate level and type of equipment for particular circumstances could assist in avoiding serious pitfalls. There is no benefit and probably significant wastage of resources in the adoption of advanced technology that provides a capability beyond the quality, resolution or rigour of the data inputs.

The issues relating to research

Information and guidance

- identify cost-effective procedures and methodologies suited to developing countries that can be used without compromising the quality of the census;
- assess the suitability and availability of current conceptual and operational information available to countries on census taking, including methodologies, guidelines and frameworks.

Operations enhancement

- design efficient procedures / methods to minimise costs and maximise utility and quality at each stage of the census process;
- develop efficient methods for internal / external monitoring of census procedures;
- determine ways of optimising efficiency through the deployment of small numbers of well-trained and efficient enumerators / operators;
- develop a schedule of realistic costing for all of the major elements of the census process as a guide to cost savings and avoidance of wastage or being over charged.

Best practice

- review national census programmes to determine factors influencing resource allocation and mobilisation, cost saving and cost effectiveness, domestic and international resourcing;
- develop a set of indicators for measuring census capacity and performance;
- develop a 'best-practice' set of procedures for census planning and implementation based on the experience of systems (e.g., capacity and performance indicators) with varying capacities;
- investigate and test the suitability of particular procedures and instruments in their operational context before adoption and implementation;
- develop cost-effective approaches to training (especially temporary) staff suited to specific national / cultural contexts.

Virtual capacity

- review experiences of regional (e.g., SADC) cooperation and develop appropriate modalities for inter-country or sub-regional cooperation;

- draw on experiences of outsourcing, identify the particular components of the process amenable to this strategy and determine the circumstances in which this practice can be a preferred option.

Funding

- compile a practical guide to assist developing countries to identify potential donors of funds; basic donor requirements; and standard procedures for requesting funding;
- consult with bilateral and multilateral donors to establish and propagate information on favoured priorities and practices in the process of census taking that will attract / deter funding agency support.

Preparing for the next round of censuses

- initiate research on conceptual, methodological and operational issues and challenges for the next round of censuses;
- determine and recommend levels of technology appropriate to particular groups of countries / circumstances for the next round of censuses.

Strategies

The context

Preparation, planning, foresight, thoroughness: how things are done can be as significant for the final, quality outcome, as the basic mechanics of the process of census taking itself. There are many elements of a census

Box 2.4

Managing the Census

Two recent volumes go a long way to remedying the deficiency in comprehensive information on how to actually manage the process of census taking. Published by the (UK) Department for International Development and the United Nations, both derive from institutions with long experience of advising on and implementing census taking and with a concern for supporting NSOs in developing countries. The first, *Counting Heads: A Practical Guide to Census Management* by Mahon and Crone (1998), points out that, although in their book "*there is emphasis on the obvious, it is the obvious that is often overlooked: common sense, distinguishing the practicable from the desirable, having a clear idea of one's purpose, taking the simplest route, thinking ahead, testing every assumption and trying every procedure*". The United Nations (2000) *Handbook of Census Management* is divided into six chapters reflecting the census cycle and provides comprehensive and detailed advice on overall census management (including quality assurance), preparatory tasks, field operations, data processing, census products, and evaluation (including analysis).

enumeration that are not included in the three preceding concepts of advocacy, capacity building and research and yet are essential to the successful conduct of a national census.

In many respects the identifying of strategies is the identifying of pitfalls and their avoidance. While census manuals provide comprehensive information on the various components and phases of the process, they are less likely to provide advice relevant to developing country situations on the manner and style of implementation.

Box 2.5

Forward Planning and Effective Management Are Essential Strategies

Eliminating uncertainty by planning meticulously is the sine qua non of a successful census, yet a difficult strategy to achieve in the context of political, bureaucratic or financial unpredictability. Much depends on the ability to generate and deploy the requisite resources in the most effective configuration and to monitor and control the inputs and outputs to specification. Management style and efficacy is therefore paramount if the census is to be carried through to a satisfactory conclusion and not truncated by external intervention, shortage of funds or failure of the system.

Supportive networks nationally and internationally can contribute significantly to levels of coordination, cooperation and consultation that provide an increased degree of assurance for successful completion. These are built up over a lengthy period and comprise one of the many activities that should be pursued during the preceding intercensal period.

The issues relating to strategies

Comprehensive planning

- design desired census data outcomes / products early to focus and drive the whole process;
- find the means to break out of the repetitive cycle of inadequate funding, inadequate resources, poor quality output and the consequent risk of reduced demand;
- develop a strategic sequencing of longer-term capacity building;
- consider outsourcing for non-core activities in areas such as preparation of publicity material and enumeration area maps;

- cooperate with mapping agencies to avoid one-off, short-term updating and production of detailed maps for enumerators;
- adopt arrangements for procurement that include leasing, hiring, borrowing etc to cut costs on facilities or equipment not required permanently;
- design questionnaires to be labour saving at each stage of the census process.

Box 2.6

Operation of a Trust Fund Could Complement Donor Sponsorship

The *International Expert Group Meeting on Mechanisms for Ensuring Continuity of 10-Year Population Censuses: Strategies for Reducing Costs*, held in Pretoria, supported the notion that a UNFPA managed Trust Fund be established to support many of the tasks not otherwise adequately covered. In particular, those occurring during the post-data processing phase, including, *inter alia*, analysis, data dissemination, storage, archiving and policy dialogue on census findings. This could be an important component in facilitating strategies dependent on national and international coordination, cooperation and consultation.

Management of the census process

- put in place mechanisms for optimising coordination between the census office and census stakeholders;
- build on existing efforts and attempt to make more efficient use of what is already in place;
- systematise and implement comprehensive fieldwork strategies and training programmes / schedules to ensure quality is not compromised by shortcuts and cost-cutting;
- design a census management system incorporating all necessary processes including budgeting;
- plan the process and monitor the financial resources to ensure completion of the whole process including such components as analysis, dissemination, storage / archiving;
- develop internal coordination and integration;
- establish linkages and facilitate communication between all components of the census (questionnaire design, enumeration, data processing, analysis, publication and dissemination);

- develop liaisons with other departments / agencies in the intercensal period with a view to sharing / borrowing facilities and resources to mutual advantage;
- monitor and record the process, costs, operational and other problems for future reference assuming minimal continuity in staff personnel.

National and international coordination, cooperation and consultation

- design appropriate strategies for marketing census programmes to national governments;
- promote a sense of country ownership;
- strengthen international coordination and encourage and develop North-South mentoring synergies;
- explore South-South cooperation and inter-country attachments as ways of sharing skills and reducing costs of retaining international experts;
- compile a register of national expertise on the various phases of census taking for coordination, cooperation and consultation through South-South communication on common agendas.

CHAPTER 3

A CRITICAL APPRAISAL OF CENSUS COSTS[1]

Iqbal Alam

Introduction

Population and housing censuses are the largest and most costly data collection activities that governments undertake. Census data provide a unique quantitative foundation for use in national and sub-national planning across a large number of sectors. The increased demands for timely, accurate and detailed data, along with rising population numbers, have contributed to making decennial censuses more costly than ever to conduct. Consequently, there is growing national and international pressure for making population and housing censuses more cost-effective. Public sector budgets have come under closer scrutiny with constraints increasingly being imposed on public spending. Furthermore, there have been recent cutbacks in the funding for international development assistance which, in the past, has been a major source of funding for censuses in many developing countries. In this climate, increased attention is being focused on the resource requirements for carrying out censuses.

There has been little systematic cross-national study of the costs of collecting statistics, particularly through censuses, due mainly to the difficulties of obtaining meaningful comparable information (United Nations, 1996). The census operation involves numerous agencies (units) of government, the private sector, academic institutions and NGOs at various administrative levels. Partly because census activities extend beyond the routine operations of a single unit of government, and involve the contribution of many different organisations, full costs of censuses cannot readily be determined.

Frequently, the major and most readily identifiable costs, such as cartography, field enumeration, training, data processing, and publication of reports, are explicitly stated in census budgets, although actual costs are often underestimated. However, the additional resources required for a census may be contained in the budgets of other governmental units, or covered in an earlier budget, without explicit identification of the census component. Examples of this situation might include transportation provided by the Ministry of Transport, or publicity for census activities provided free of charge through the government broadcasting agency of the Ministry of Information. Given the constraints on obtaining accurate and comprehensive information on census costs, the discussion here focuses on the methodological issues in determining resource requirements for population and housing censuses. By identifying the main activities of a census and considering some of the areas where cost reductions can be made, countries can be better equipped to plan and conduct cost-effective censuses.

The discussion is divided into two sections. The first section deals with some of the general issues related to the development of census budgets and census costs, as well as some of the main activities that account for these costs. The second section considers cost-saving strategies in light of past experience. The chapter concludes by considering how countries might address issues relating to census funding through intercountry cooperation.

Issues related to census costs

Financial accounting practices vary greatly among countries and therefore the United Nations (1997) publication on *Principles and Recommendations for Population and Housing Censuses* does not suggest a universal system of census budgeting and cost control. The *Principles and Recommendations* do, however, emphasise the need for data on effective planning and control of the various census activities used to prepare financial estimates for the cost of each of the census activities.

The *Principles and Recommendations* recommend that to assist in monitoring the cost of current censuses and to have the information needed for the next census, detailed and precise data are needed on the following:

- number and cost of census staff classified by function and amount of payment;

- type of equipment and material used for the census, manner of acquisition (that is, purchased or rented) and cost;
- surface measurement of office space used and cost of office space classified by use and type of cost (that is., for construction or for rent);
- type of services used for census operations.

The usefulness of this information would be enhanced if sources of funding could be specified and recorded as expenditure from:

- the official census budget;
- other funds of the census office (for example., from a regular annual budget not specifically intended for census purposes, or from general funds of the governmental agency or department of which the census office is a part);
- other parts of government;
- non-governmental organisations.

This information is needed not only for fiscal planning and control, but also for examining the trade-offs in terms of costs and benefits among alternative ways of carrying out various census operations.

Because of the infrequency of censuses, the institutional memory of census organisations about precise costs is frequently ineffectual. Furthermore, in some contexts there is no history of census taking, and those responsible for making cost estimates lack a firm basis for doing so. In order to arrive at a realistic cost estimate, it is of paramount importance that persons at the administrative and supervisory levels responsible for the execution of each operation participate in estimating the budget item(s) for which they will be responsible. Such organisation of the work presupposes detailed advance planning and 'cost-consciousness' on the part of those responsible for a census.

Generally, at the census planning stage, plausible estimates of the costs of the census operations are calculated. However, the census plan commonly changes in a number of respects after the original calculations

have been made, and more often than not this tends to lead to higher costs than budgeted for. While a perfect correspondence between the estimates and the final costs is not to be expected, large cost discrepancies tend to undermine the credibility of census takers in the eyes of finance ministries and create difficulties for census authorities in obtaining necessary government approvals. In practice, the development of the census budget is usually an incremental process in which rough initial estimates are replaced by more detailed and precise statements of resource requirements. Adjustments to initial census cost estimates should be made as early as possible.

In the past, throughout the period of census taking and compilation of census results, budgets were evaluated and compared with plans. In some instances, at the time of planning, census costs were purposely overestimated and in others underestimated. Cost estimates are sometimes prepared mainly to ensure that census legislation is passed through the bureaucratic hurdles and that ministries of finance are authorised to appropriate funds. In cases where costs were underestimated, the census organisations generally submitted a revised budget close to the census date for additional funding. In cases where they were overestimated, ministries of finance have commonly made cuts before approving the budget. As stated earlier, such practices have greatly undermined the credibility of census organisations and census authorities are now finding it more difficult to get the necessary government approvals.

In order to avoid cost-overruns, initial cost estimates should be realistic and factor-in inflationary trends. With detailed information on expenditure, the governmental and census authorities will be better able to control the development of census operations within the census budget, as well as to assess and control the effectiveness and efficiency of these operations. The main activities accounting for the bulk of census costs are identified in the discussion that follows.

Census mapping / cartography

The preparation and assembly of maps for a population and housing census is one of the most basic and important preparatory tasks of the whole census operation. Accurate maps provide the basis for numerous census tasks, including the allocation of enumerator assignments, estimation of travel time and costs, establishment of field offices and the

Box 3.1

Deficiencies in Consistency and Continuity of Financial Records for Censuses

In the 1980s, the United Nation Statistics Division (UNSD) conducted an inquiry to find out whether and how financial records for census taking are kept. Among those countries that responded to the inquiry (95 out of 138), a substantial number maintained records of census expenditure by type and the stage of census operation. However, there was no uniformity in record keeping, and in most instances countries were unable to classify their administrative records in ways that enabled them to provide the specific details requested in the inquiry.

The inquiry also suggested that single cost indicators, such as total census cost per capita, are subject to a host of limitations, which made it very difficult to say that one census is more expensive than another. Summary cost indicators can, for example, obscure differences in the product (that is, the quality, quantity and timeliness of census statistics) or fail to take into account differences in census methods, organisation or funding. The inquiry also revealed that in many countries there was no central point within the census organisation, or statistical office, where census expenditures are compiled. While detailed data on the resources utilised for specific census operations existed in different agencies/ministries, or at different levels of government, they were often not readily accessible, and in some instances they were not retained for very long.

organisation of supervision. Furthermore, the prevention of omissions and duplication in enumeration depends to a large degree on the accuracy and precision of the available maps. In mapping, as with the other phases of the census-taking process, there is considerable variation between countries in the amount of work that must be done to produce maps. In many countries, the compilation and publication of maps is a continuous process and an integral part of the system. Comprehensive maps exist and they are updated routinely. In other countries, by contrast, the maps used for earlier censuses are often lost, misplaced or out of date so that the compilation of the requisite maps must begin again for each new census. As a consequence, countries require different amounts of time and resources to be devoted to the production of suitable census maps.

Costs of map preparation are often underestimated (because of lack of knowledge of the amount of work required to produce useable maps) resulting in budget shortfalls that lead to considerable cost overruns. Alternatively, in countries where suitable, detailed maps are available

elsewhere, the procurement costs of these maps are often overlooked, resulting in last-minute escalation and adjustment of the census budget. In addition, the census organisation commonly fails to appreciate that available maps do not fully meet enumerator needs because of the lack of the necessary detail, such as exact demarcation of the location of dwellings. Enhancing the details on existing maps for census use may require considerable additional expenditure in time and resources.

Alternatively, if adequate funds for mapping are not available the quality and detail of the maps may be compromised. This, in turn, reduces their usefulness, makes census fieldwork more difficult and inevitably reduces the overall quality and accuracy of the final census data. With the advancement in technology, a more cost-effective approach may be the adoption of digitized mapping. Even though the initial costs may be high, in the long run countries may save substantial resources and time in the preparing of census maps.

House numbering and household listing

In census planning and preparation, consideration should be given to providing a permanent identification to streets and buildings. There is a considerable challenge in preparing a reliable list of living quarters, particularly in densely settled localities, unless streets and lanes have names, and buildings have unique numbers. Establishing a permanent household and building numbering system is a costly operation but it can serve a great number of other administrative functions and purposes as well. Therefore, it is in the best interests of the census organisation to ensure that each building/living quarter has a unique census identification number. While the responsibility for house numbering in most countries may not primarily be the responsibility of the census office, the checking and numbering of all structures to facilitate and ensure the completeness of census enumeration must be carried out by the census office as part of the preparatory work. This task can have significant cost implications.

Administrations frequently adopt different techniques in rural and urban areas. Many countries carry out household listing in conjunction with house numbering. This list will be used by the enumerator to make sure that all buildings in the area of assignment are covered. This mode of operation means that all households will be visited twice during the census. In some countries, to reduce cost, the household listing and

house numbering operations are carried out as the first stage of census enumeration. A combined operation, if carried out diligently, does not reduce the effectiveness of this procedure.

Census tests

The importance of carrying out census tests cannot be overemphasised. The failure to pretest concepts and procedures can easily produce inadequate results, raising costs and losing time. A limited budget or lack of time or staff should not be accepted as reasons for neglecting census tests. In fact, it is precisely in situations where resources are limited that these tests are most useful, because they give valuable guidance in optimising the use of scarce resources by indicating the limitations of the operational plans. Such tests should be an intrinsic part of the process of planning a good census.

The first tests include those that evaluate field procedures relating to various aspects of the operation such as quality of mapping, suitability of the forms, clarity of the instructions, concepts and definitions, and assessment of workload. Such tests are generally called pretests. The last census test, and the most important one, is the pilot census, which is generally a comprehensive test of all census procedures taken about one year before the enumeration itself. It is therefore necessary that it should be conducted under conditions that are, as far as possible, similar to the actual enumeration. The estimates of costs vary considerably, depending upon factors such as the size, locations, and comprehensiveness of the pilot census.

Staff recruitment and training

The personnel and training requirements of the census organisation are wide-ranging. Since the majority of the staff are recruited and assigned work at short notice, training has to be organised and implemented as early as possible to equip people for their tasks. The categories of staff that have to be trained include:

- clerical, administrative and financial staff;
- technical personnel in charge of the census operations at headquarters;
- cartographic staff at headquarters and in the field;
- executive staff at regional and sub-regional levels;
- enumerators and supervisors;
- editors and coders;
- data-processing personnel.

It is necessary to structure the content and duration of the training programmes and to develop training materials appropriate to each category of staff, making provision in the focus of training for differing levels of responsibility among personnel within each category of staff.

The training of census field staff constitutes the largest non-military training programme likely to be undertaken in almost any country. The training of all levels of staff is important to the success of the census, but the training of the field staff, consisting of enumerators and their supervisors, is absolutely vital. The adequacy and intensity of this training ultimately determines the quality and utility of the census itself. Organising the training of the field staff is more difficult than organising the training of the other staff, mainly because of the large numbers and wide dispersal of supervisors and enumerators, but also on account of the severely restricted period of time over which the census has to be conducted. It is therefore of paramount importance that no shortcuts are taken in the training process, even if this necessitates acquisition of additional funds.

Enumeration

The enumeration or collection of information on the population and households of a country is the central operation in census taking. This operation is of singular importance, not only because every individual and housing unit in a country must be enumerated, but also because the enumeration, which can be enormous in scale in many countries, must be completed within a short, fixed period of time. The enumeration phase constitutes the crucial stage for all census planning and operational implementation, and is the most expensive phase of the entire census process. The cost of census enumeration depends on such factors as the method of enumeration (canvasser method versus the householder method), scope of the enumeration, number of questions on the census questionnaire, the size of population, the quality of field workers, and the enumerator workload.

While deletion or addition of one or two questions usually has an insignificant impact on the resources required to conduct a population census, large additions to the number of questions normally included may require more resources in the enumeration and data processing stages of the census operation. Moreover, in terms of the resources required, not all questions rate equally. In particular, recording of data

Box 3.2

Conflicting Principles of Questionnaire Compilation

The selection of items on the schedule for a population and housing census represents two conflicting principles :

- **the demands for additional questions in order to maximise the range of themes addressed in the questionnaire and to satisfy the needs of the many stakeholders and users of the census data, all exert pressure to expand;**
- **the problems with a lengthy questionnaire of prolonged interviewing, the possible reduction in the quality of information supplied, and the increased costs, all exert pressure to keep the number of questions to a minimum.**

for responses that cannot be pre-coded (for example occupation, industry and detailed place of residence) constitutes a particular concern. Also some items, such as number of children born/living, require that a particular, knowledgeable member of the household should respond, and this may result in a substantial increase in interviewing time. It is, therefore, of the greatest importance that items to be included in the census questionnaire should be carefully considered and their value weighed, not only against alternative questions, but also against issues such as quality of data, alternative sources of information and cost implications.

Another important consideration in census enumeration is the size of enumeration areas. For census purposes, a country is divided into enumeration areas which are generally small enough to be covered by one enumerator during the period of time allotted for enumeration. The method of enumeration, the size of an enumeration area, the number of households in each enumeration area, the length of the questionnaire, respondent characteristics, and the duration of the enumeration determine the size of field staff, all have important cost implications. The criteria for determining the appropriate size and character of a single enumeration area are likely to vary between urban and rural areas.

Adequate supervision of the enumeration process is essential. When the enumeration lasts only a few days, the quantity and quality of the work accomplished after the first day of enumeration is reviewed in order to facilitate the eradication of inefficiencies and the maintenance of satis-

factory progress during the remainder of the enumeration period. Where the enumeration extends over more than a few days, periodic and systematic assessment is required. It is essential to budget for appropriate supervisor-enumerator ratios so as not to compromise field control and quality checks. Similarly, field travel budgets need to include supervisory field visit costs.

Use of sampling in the enumeration

The impact of the use of sampling on census costs is of crucial significance. Generally, it is assumed that the use of sampling reduces the cost of an enumeration and improves the quality of information. In many instances this is correct. However, numerous factors govern the cost of sampling and it is essential that they are fully weighed before a decision is made to combine a sample procedure with a complete count. One important factor, for instance, is the size and complexity of the sample, which in turn is governed by the objectives of the survey and the procedures that are regarded as most efficient. One of the main problems observed in the use of sampling together with a full enumeration is the biased selection of sample households. In order to avoid selection bias, it is important that the actual selection of the sample units should be carried out either in the central office or in regional offices, under the supervision of a sampling expert.

Data processing

No matter how thorough and accurate the census enumeration may be, the usefulness, quality and timeliness of the census tabulations suffers unless the collected data are properly processed. An important element of a successful processing operation is the close and continuing collaboration, at all levels, between the data-processing staff on the one hand, and the subject-matter and general statistical staff on the other. At a minimum, the subject-matter and the general statistical staff need to become familiar with and take a continuing interest in the processing plans and operations, while the processing staff need to become familiar with and take a continuing interest in the substantive aspects of the census. Problems in developing close and productive relationships between these groups of staff may delay processing time and hence increase overall census cost.

The choice of an appropriate data processing method depends on the circumstances of each country. Rapid advances in computer technology

have greatly increased speed and reliability in producing detailed tabulations, making automation the standard method of processing in most countries. Microcomputers are now used in practically every phase of census operations. All tasks, including editing and tabulation of data files, can be done on small-sized desktop systems which can be located in participating departments and in field offices. Consequently, the cost advantages of a centralized data processing facility and of decentralized processing options should be carefully evaluated before deciding on the main approach. Other factors that would determine the overall costs of census data processing are the number of statistical tables that must be produced, the complexity of these tables, and the degree of geographical breakdown that each table entails.

Coding

The trend is towards providing for *pre-coded* responses from census questionnaires with numeric or alpha-numeric codes printed next to each category of response. Since computer editing and tabulation of textual variables is not practical, verbal responses are replaced by a code. This is done by a coder (possibly computer-assisted) or by a dedicated computer program for automatic coding. There are obvious advantages to directly coding the respondent's answer into the questionnaire during the interview, since the respondent is still present to provide clarifications if necessary. Unfortunately, in most cases this is not practical because enumerators are normally insufficiently trained and they cannot be expected to carry the required codebooks and manuals during enumeration.

The number of items to be coded and the complexity of the codes are two of the most important factors affecting the coding cost. The more pre-coded items that can be recorded directly on the questionnaire the fewer coders required. In addition, the length of time required to complete the overall coding work affects the coding cost. Some countries employ more than one shift of coders in order to meet the coding time requirements, but this approach usually requires that more funds are made available earlier in the processing stage.

Data capture

The most common form of census data entry relies on *keyboard data* entry using microcomputer software with built-in logic controls. Some of the tasks performed include:

- verification that enumeration area codes are valid, followed by automatic copying from one record to the next;
- totalling the persons in a household automatically (and possibly also the number of households) within an enumeration area;
- switching record types automatically if the program logic requires it;
- ensuring variable values are always within prior determined ranges; and skipping fields if the logic so indicates;
- supporting keyboard verification of the information entered earlier; and generating operator statistics.

The complexity of actions that have to be performed during data capture can affect the overall time and cost of processing.

In order to avoid delay in data capture, data entry applications should limit the checking to problems that are either very serious (such as wrong enumerator area code), or are caused by a simple misreading or a keying mistake. More sophisticated checking is deferred until the editing stage. Various technologies, such as: *optical mark reading* (OMR; also often called optical mark recognition), *optical character reading* (OCR; also called optical character recognition), and *imaging techniques and scanner devices*, together with OCR software, have recently been used by several countries for data capture. The choice of appropriate technology largely depends upon the available resources. In most countries, the time required for census data capture is the determining factor for overall census data processing. As in the case of coding, many countries apply two or three shifts per day to optimise the use of the available equipment and to shorten the processing time. To determine the census processing costs, census planners must carefully analyse the need based on the quantity of equipment to be procured, the average number of keystrokes per data-entry operator, the number of shifts that data-capture staff can work and the time required to complete the data processing. Where a premium is placed on timely release of the census results, deployment of more equipment and staff must be expected to increase costs.

Publicity

The successful implementation of a census requires the full cooperation of the public, and it is only reasonable that the public should be notified of a forthcoming census well in advance of the census date. Efforts should be made to utilise all available media and communication channels to inform the public about the information being collected in the

census, the confidentiality of the information collected, the importance of collecting complete and reliable information and its intended use for a wide range of social and economic planning.

Cost Saving Strategies

There is a fine balance between keeping the vast census costs to a minimum, and preserving the unique advantages of the census as a tool for a complete stocktaking of the size, distribution and characteristics of a country's entire population. Cost-reducing strategies should not compromise the quality of the information that is being collected. Nevertheless, with escalating census costs (often partly attributable to rapidly growing population numbers), countries have to weigh up carefully the various costs and benefits of their approaches to census taking at every stage of the operation.

Census topic selection

Administering a streamlined census questionnaire which contains only a minimum number of basic topics will utilise fewer resources than if the questionnaire contains a large number of topics. Additional questions add to the cost of a census at every stage, from collection through processing to tabulations and dissemination. Census takers should ask whether users' needs can be satisfied with information from other sources, and recognise that not all types of subject matter are suitable for inclusion in a census or capable of yielding robust results. Questions should be factual, well tested, and capable of being easily asked and readily answered. One cost-reducing strategy is to exclude topics that can be covered more economically by surveys because the data sets do not require analysis for sub-groups or at a disaggregated geographical level, degrees of resolution at which the census excels.

Sampling for collection and processing

Sampling in a census can be adopted either at the time of enumeration and/or at the time of processing. The rationale for sampling at enumeration is for reducing field, training and processing costs and enhancing data quality, or providing an opportunity to ask more detailed questions from a sub-sample of households. It also lessens the burden of response for households not included in the sample, and at the same time leads to improvements in the quality of the information collected from the sampled topics. However, where sampling at the enumeration stage is contemplated, great care should be taken in deciding upon the appro-

priate sampling design, and the instructions given for its implementation and supervision.

In countries with large population size, sampling at the processing stage enables quicker production of preliminary tabulations after the census date and reduces costs, particularly of coding, data input and editing. It is one means of reducing the considerable cost of data processing within a restricted time frame. Sampling at the processing stage avoids many of the operational difficulties of sampling in the field. However, after releasing early sample results it is important to process the remaining questionnaires without undue delay. The release of sample results should not obscure the objective of timely processing of the entire census.

Training of field staff

Recruitment, training and management of a large but temporary field force of census supervisors and enumerators constitute expensive components in the census operation and require careful planning and consideration. The problems connected with the recruitment of a large temporary workforce are compounded by the need for highly competent staff who are capable of collecting information according to specific definitions and instructions and who are available and willing to work diligently throughout the short but very active period of enumeration. The principal sources of personnel for staffing the enumeration phase are: teachers, students, other government employees and unemployed educated young people.

Where sampling is employed in a census, the qualifications of the field staff will differ between those involved in the full census count and those involved in the sample enumeration. Different approaches to training are required, and these also have different cost implications. In large countries, a cost-effective approach to training is to commence the process at census headquarters, usually for senior permanent officials. Following that, the training of middle level census staff takes place, mainly at the provincial level. Finally, supervisors and enumerators are trained at the local district levels.

Data processing

Computer technology has led to a continuing revolution in the processing of census information. This in turn has had important implications

for questionnaire design and the nature and format of production and dissemination of census results through electronic networks and computer-based media. Cost reducing devices include: use of microcomputers for data entry at decentralized levels; optical mark/character reading (OMR); computer-assisted coding (CAC); and user-friendly multifunctional software packages. Adoption of new technology, while it might be considered a cost-cutting strategy, requires an extensive knowledge of recent developments in this rapidly changing field. Otherwise, selection of inappropriate equipment produces delays and inefficiencies while still resulting in similar or even higher costs.

Cost reductions in census data processing can also be achieved by a set of simple strategies such as having:

- well designed census questionnaires;
- comprehensive editing specifications that produce clean census data master files in one run, avoiding reprocessing;
- less complex and smaller sets of census tables as the primary output;
- an in-house computer maintenance capability or, lacking that, an appropriate contract with a local company that can provide this expertise.

Conclusion

While it is universally recognised that population censuses provide a continuity of comparable statistics for a wide range of social and economic planning purposes, the very high costs of conducting censuses coupled with shrinking public sector budgets has raised doubts over their future. The time may have come to consider the cost-saving advantages of going beyond the application of census sampling strategies within individual countries. This might entail learning from the experiences of other countries or even sharing selected census activities among groups of countries with similar data needs. For many countries, these activities might include sharing of census questions or questionnaires, and developing common training programmes, census manuals, data processing facilities, and analysis and dissemination mechanisms. SADC countries, for instance, have developed questionnaires with common core questions, a regional training programme and a system of sharing available technical expertise among member countries (for example, Zambia provides Namibia with a cartographer.) These countries have established a mechanism to share information on census costs, and this in turn provides the foundation for establishing a census cost-reporting system.

Arrangements such as these require strong political commitment from participating countries, sub-regional cooperation and efficient networking. To achieve this, countries must be more proactive in clearly specifying their needs and the direction in which they wish to move. Increased technical cooperation among countries in their sub-regional clusters will be needed for the successful implementation of their censuses. New sources of funds will need to be tapped with greater involvement of the private sector offering one important potential avenue to be further explored in the future.

CHAPTER 4

COOPERATIVE RELAY CENSUSES AS A CENSUS COST-SAVING STRATEGY

Harry A. Freedman

Introduction

It has often been stated that a census is the largest mobilisation of sustained manpower activity in a country in peacetime. The analogy between a census and military operations can be extended further. A successful census, like a successful military campaign, requires meticulous planning; adequate financing; well-trained, disciplined, and dedicated personnel; detailed geographic intelligence; logistical expertise and equipment, to get the myriad of items required in the right place at the right time; and a good questionnaire. The questionnaire should be capable not only of collecting the information required accurately, without bias, but should also be structured in such a way that the responses can be captured, efficiently and accurately, in a timely manner. Finally, a sound processing system is required along with a flexible tabulation and dissemination system.

Unlike a military campaign, however, there is no enemy to confound. This makes for greater difficulty in achieving the requisite priority for adequate funds to be allocated in sufficient time to do the job as planned. There is also no way for wile to make up for weaknesses in resources, preparedness or execution.

Another problem for census managers, is that the periodicity between censuses is quite long, typically a decade. In the interval between censuses, much of the hard-learned experience is lost. Thus mistakes made in earlier cycles are more likely to be repeated unless there is some way for these hard-learned lessons to be transmitted to the new staff.

Finally, the cost of censuses is escalating at an ever-increasing rate, at a time when governments are finding it more challenging to fund all the tasks they are being pressed to underwrite.

This makes it imperative for all National Statistical Offices (NSOs), but especially those in less developed countries, to find innovative ways of conducting their censuses more cost effectively. This needs to occur concurrently with efforts to improve data quality and release these data more quickly and in formats that are easier for all clients to access, use and understand. This seems like an impossible challenge, and will be unless NSOs can determine new ways of overcoming traditional problems.

The only ways to overcome the conundrum of doing the same, or more, with less, is to eliminate waste, introduce efficiencies, and purchase goods and services more economically. This can only be achieved by exercising effective planning control over the process so that personnel and materiel are productively deployed and capable of dealing with both the expected and the unexpected as they occur.

One strategy that the private sector adopts to address this challenge (and that governments have difficulty using) is to grow and introduce economies of scale in order to reduce unit costs. Private operators do so either by expanding their markets or by merging with their competitors, or both. An NSO has only limited potential in this direction. It can simulate this approach, to some degree, by introducing standardisation in processes, procedures, hardware and software, since these measures eliminate some duplication and improve efficiency and expertise. This is a constructive step but, by itself, is unlikely to achieve economies on a sufficient scale in the current environment.

While NSOs cannot merge with others to become larger, they can achieve similar ends through cooperation with neighbouring statistical offices by sharing expertise, development costs, hardware and software. The larger the cooperative consortium, the more scope there is for savings and the greater the consequential degree of flexibility. This solution has been tried in the Caribbean region and the Pacific Islands with apparent success.

The Strategy

The census is such a major undertaking that most developing countries have difficulty in finding expertise to master each of the stages. Sub-optimal solutions to difficulties encountered along the way not only increase the cost of each stage but also tend to affect subsequent stages, thereby having a cumulative impact on the cost and quality of the census. In a census consortium, each constituent statistical office can identify its particular strengths and choose one or more of them as an area of expertise and specialisation it will contribute for mutual benefit in a census cycle. Other members rely on this expertise in developing and executing their censuses.

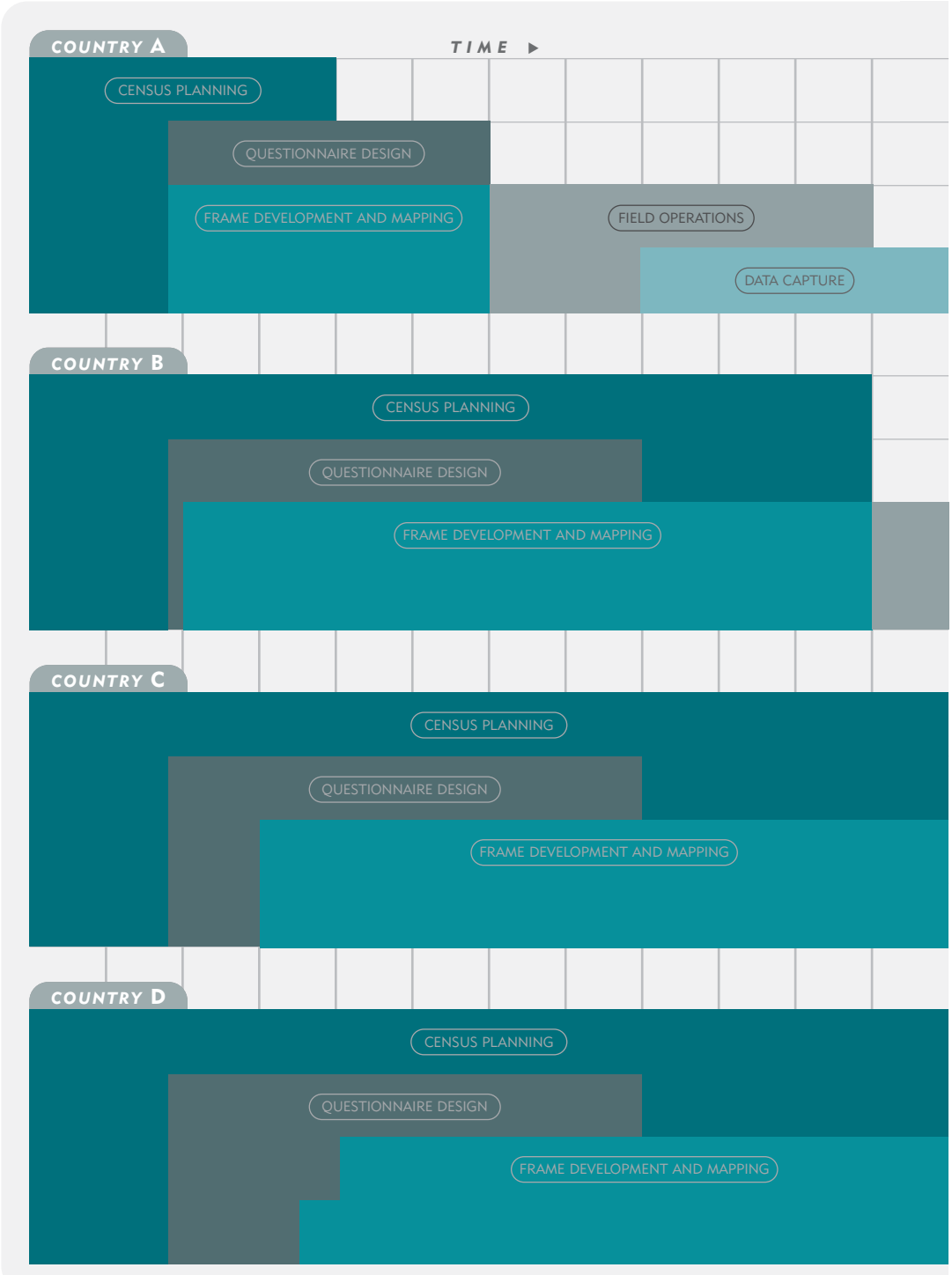
The strategy involves having a number of countries plan their censuses together and stagger their timing so that the second country begins an operation shortly after the first is scheduled to complete. This strategy allows an NSO to use some of the staff from the partner country as managers or mentors for novice local managers, all of its own staff (some of whom would have been involved, as apprentices or journeymen, in the first country's operation) plus some staff of countries who will carry out this operation subsequently (**Fig. 4.1**). Thus all staff will be involved in the same tasks more than once in a relatively short period of time. Skills learned will be reinforced and honed. This expands the manpower pool and makes it easier to deal with the unexpected since there is more experience to draw upon. This approach is also more efficient and, because of repetition, there is a much greater probability of skill refinement and retention for the longer term.

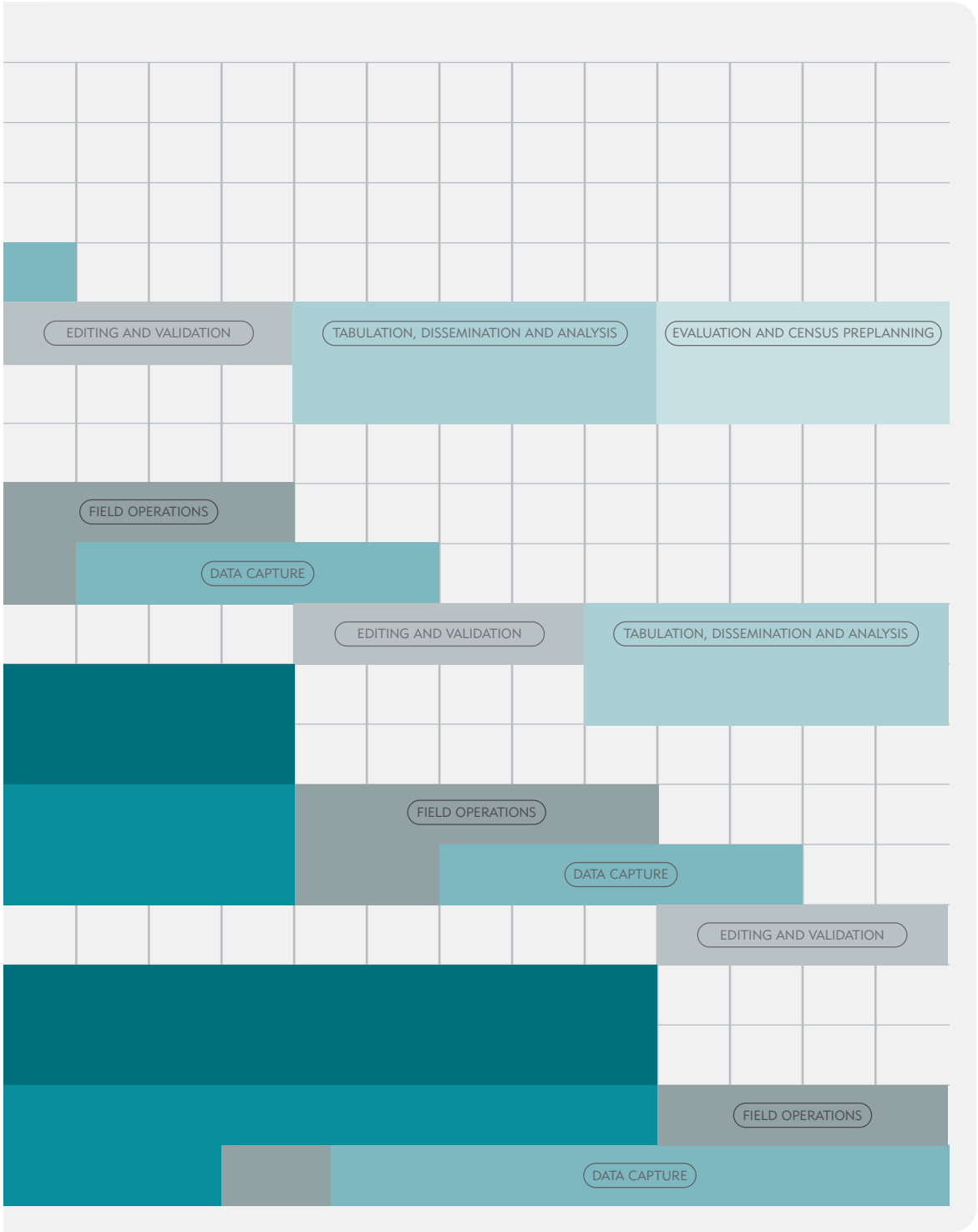
The ways such a strategy could be implemented are limited only by the resources available to each partner country, and the imagination, flexibility and cost implications of alternative solutions. If each partner feels that it derives greater benefits from the consortium than it costs it to participate, the strategy has a good chance of succeeding.

Prerequisites

Every new approach comes with costs, some of them monetary, but many are of a less substantial nature. The biggest cost of this approach is the apparent loss of independence of any one NSO to follow its own preferred way. This is the real cost of cooperation.

FIGURE 4.1: A Cooperative Relay Censuses Schema




EDITING AND VALIDATION
TABULATION, DISSEMINATION AND ANALYSIS
EVALUATION AND CENSUS PREPLANNING
FIELD OPERATIONS
DATA CAPTURE
EDITING AND VALIDATION
TABULATION, DISSEMINATION AND ANALYSIS
FIELD OPERATIONS
DATA CAPTURE
EDITING AND VALIDATION
FIELD OPERATIONS
DATA CAPTURE

However, it is a true cost only if a country has the means to carry out a census alone! If it does not, this cooperative approach may be less costly than other alternatives or than the cost of not doing it at all. How large such a cost is depends on how different the current approaches are; how open to innovation members are; their willingness to adopt best practices; and how creatively they can deal with problems among themselves.

Setting the Stage

While it is difficult for any NSO to master all components of a census, each office has done better in some areas than others or has externalities that re-enforce certain skills or expertise. Because it is such an intensive and intermittent process, there is difficulty in mastering and retaining all the needed skills. If countries can agree to stagger their censuses and cooperate in their execution, each will be able to benefit from another's skills and have multiple opportunities to hone and retain any skills acquired.

NSOs in countries that are already cooperating in other ways, may find it easier to contemplate census cooperation although they may still need a supranational organisation to act as initiator and honest broker to get the process under way. Certainly, they must recognise the need for planning ahead, planning accurately, and fulfilling commitments.

Dividing the Census into Components

Census operations comprise numerous parts, some of which overlap so that it may be difficult to get consensus on just where one component ends and the next begins. The following outline provides one possible illustration of how the census process may be divided and how NSOs may benefit from cooperating. The outline is not intended to be comprehensive, nor is there any claim that it is superior to some other version of which the reader may already be aware.

Census planning

This is a critical stage of the census. If the plans do not provide adequate time and resources for each stage, the impact on the census becomes cumulative through subsequent stages. This implies that the Planning Team must have access to, and the wisdom to profit from, expertise relevant to all stages. A census consortium has a greater ability to put together a good Planning Team than any NSO acting alone, and its strength will grow progressively with each successive census. Since

there is likely to be a relatively short interval between each of the series of censuses (the interval may vary through negotiation but is unlikely to be more than one year), there should be plenty of time and sufficient continuity for skills to be acquired, retained, and passed on.

Questionnaire design and format

This may appear to be the most contentious area for cooperation. However, most national census questionnaires have a substantial proportion of their questions in common. There may be some debate over question wording and question order, but these can be resolved if expertise rather than emotion or tradition takes priority. Furthermore, there it is not necessary for ***all*** questions on a questionnaire to be the same. Issues that are important in one country may be less so in another. In such circumstances, a portion of the common questionnaire can be allocated to special topics that differ from country to country.

Questionnaire format and questionnaire printing issues are determined after carefully balancing the need to communicate clearly to respondents in order to minimise the likelihood of response error, and the requirements for efficient and accurate data capture. The more countries that use the same approach, process (and perhaps even printer), the more substantial the economies of scale and reduction in unit cost.

Frame development

In order to ensure that a census is complete, a frame must be developed to allocate materiel and personnel. It is also needed to verify the success of the census in meeting its objective of comprehensive coverage. Cartography and Geographic Information Systems (GIS) technology are the accepted means of defining and implementing frame requirements. Past experience has shown that this is often a weak point in the execution of many censuses.

Frame development is another area were huge cost savings can be made through cooperation. The skills required to maximize automation benefits are scarce and the hardware and software acquisition and maintenance costs high, so that sharing can be hugely beneficial.

Field operations

This is the most difficult and expensive stage of the census. It requires a long preparation time, the rapid accretion and training of personnel and a relatively short collection period. Throughout, careful monitoring is essential to ensure that everything is running to plan, that unexpected problems are being quickly and successfully resolved, and that collected questionnaires are arriving at their intended destination. Generals spend their careers developing the necessary comparable skills. Census offices, by default, have been relying on the best organisers available. Even the best census managers admit, in retrospect, that they wished that they had been better able to deal with one or more things that went wrong.

Instituting partner censuses as, inter alia, the training ground for each subsequent census, solves the problem of loss of census memory. The redeployment of a proportion of the best field staff from one census to the next is not only beneficial for the series of partner censuses, but also serves to transmit and improve the knowledge and skills of additional personnel.

Data capture

There are two main methods of data capture: key entry and scanning, each with a number of possible variations. Many countries, by default, opt for key entry because, despite their desire to benefit from the greater timeliness scanning can provide, they cannot justify the cost and training required to adopt that option. This is an issue that is exacerbated by the lack of intercensal opportunities to utilise the requisite equipment for anything else.

Each method has its champions and detractors and examples of successes and failures using each are available. Scanning does have greater appeal for a consortium strategy because of the improvements in timeliness and greater benefits from economies of scale. One way of mutually benefiting and simultaneously dealing with national confidentiality concerns, for example, could be by housing the scanning equipment and processing staff in transport trailers, and moving the equipment, and some or all of the personnel, to where they are needed next.

Editing and validation

While financial savings in this area may be less, this is more than compensated for by the probable improvements that occur in both timeliness and the transfer of expertise.

Tabulation and dissemination

Until such time as informatics expertise becomes commonplace, even this area provides a great deal of opportunity for savings from cooperation whether in traditional areas or the emerging areas of electronic and web dissemination.

Training

On-the-job skill transfer is a component of all the preceding census phases. Cooperation also permits savings in the more general area of professional development including, especially, computer hardware and software training needs.

Miscellaneous

Once countries and their NSOs have commenced cooperating on the census process, other possibilities will present themselves - some with a greater pay-off than others. These might include, for example: human resource planning and development; information technology hardware and software acquisition and training; standardization of concepts and definitions, including nomenclature and coding normalisation; and the sharing of development costs for new statistical programmes; and numerous others.

Many of these benefits can accrue to Statistical Offices even if they choose to cooperate selectively rather than whole-heartedly. The more extensive the cooperation the greater the benefits are likely to be since some forms of cooperation provide multiple benefits.

Conclusion

This chapter illustrates one way that NSOs can address the increasingly difficult task of financing and resourcing decennial census efforts. This is particularly important for countries which need the assistance of international donors to supplement national budgets. Many are finding it more difficult to attract the attention and support of these donors. Partnership and its associated cost savings may have sufficient novelty to attract donors back to Census projects.

CHAPTER 5

REGIONAL CENSUS STRATEGIES: REDUCTION OF CENSUS COSTS IN THE SMALL PACIFIC ISLANDS

Laurence Lewis

An Historical Perspective on Pacific Island Censuses

Spread over 30 million km2 of the Pacific Ocean, are to be found some 7,500 islands comprising the 22 Pacific island countries (PICs) of the South Pacific. The largest of these, Papua New Guinea, has a population in excess of 5 million. All the other PICs have populations below one million. The smallest, Niue, Tokelau and Pitcairn Island have populations below two thousand. Of these countries, 15 are covered by the UNFPA regional population programme and can request assistance for conducting and analysing their population censuses.

The broadest and most common groupings of the PICs, based on geographic as well as ethnic, cultural and linguistic differences, is into the sub-regions of Melanesia, Polynesia and Micronesia. Political developments in the 1960s and 1970s saw the majority of the PICs emerge as sovereign states.

The historic evolution of censuses varies widely across the Pacific. In some countries, impressive census records date back to the mid-19th century. In others, the first censuses were taken as recently as the 1960s. The earliest estimates of populations were not, in a modern sense, the result of censuses. For example, most of the records that have survived from the 18th century were provided by sailors, whalers, and other casual visitors. Estimates of the populations of the islands during that period are notoriously unreliable. By the mid-19th century, however, many of the islands had been settled by missionaries and several attempts were

made to conduct what were called censuses, but which were in fact little more than crude population counts. While no doubt more accurate than the sporadic population estimates in existence at that time, very few of these 'censuses' contained more than a rough estimate of total population numbers.

In the early part of the 20th century the situation improved, as the various colonial administrations sought to establish their authority over the Pacific territories. Thus German, United States, British, Japanese and French administrations carried out routine censuses throughout Polynesia and Micronesia. But even these were very limited in scope, restricted generally to total population, disaggregated in some instances by sex and native and foreign populations. Establishing systematic population estimates for the Melanesian countries was move complicated, given the harsh terrain in many of the islands, the scattered populations, and the numerous local languages.

The post-Second World War period marks the beginning of the modern census-taking era. By the 1950s, the Polynesian and Micronesian island states and territories were conducting regular population censuses. By the end of the 1960s, all PICs and territories had conducted at least one population census.

However, the scope of these censuses differed widely between countries. While global and regional recommendations existed, census design and the development of concepts, definitions and procedures depended largely on the practices and wishes of the colonial administrations. The constitutional linkages, for example, of the former Trust Territories of the Pacific Islands to the United States ensured that they were included as an integral part of the decennial US censuses. Similarly, the strong linkages between New Zealand and the island states of Tokelau, Niue, Cook Islands and Western Samoa, set in motion a practice of five-yearly censuses aligned to the New Zealand census programmes.

For a time, even following independence, little in the way of regional consensus existed in the periodicity of censuses, their scope and methodology. Indeed, in some of the newly independent island countries, a noticeable absence of continuity emerged as the search for donors and as the problems of developing census-taking capacity were tackled. In successive censuses, for example, the (Western) Samoan gov-

ernment was assisted by universities in the United States, New Zealand and the Statistics Office in Fiji.

Supported largely by the UNFPA, two significant developments occurred that were to lead to a remarkable convergence in the approaches that the PICs adopted to census taking. These were:

- for convening of regional and global meetings on population and housing censuses by the South Pacific Commission (SPC), ESCAP and the (then) United Nations Statistics Office (UNSO). The exchange of views that was encouraged in these meetings, and the production of a series of reports and census recommendations, provided new opportunities to develop census strategies relevant to the development needs of newly-independent countries;

- for the provision of technical advisory services. The Pacific island countries were well-served by the strengthening of the SPC demography programme from the mid-1970s and the establishment of the ESCAP regional advisory service. These regional programmes were supported by the inter-regional advisory service of the UNSO.

Thus, even before a focused programme of intercountry cooperation was initiated, a considerable convergence in census practices was beginning to emerge. For example, despite the diverse histories in census taking across the Pacific islands, in more recent times surprisingly little variation is found in the topics and questions included national censuses.

A parallel development that deserves some attention is the role played by national users in providing momentum for the improvement of censuses as a source of information. In the past, much of the pressure for conducting censuses came from overseas and to some extent from international and regional agencies. The growing awareness among policy-makers, national planners and decision-makers, that sound development plans and implementation strategies required reliable data has provided new impetus. In the absence of good civil registration systems and alternative sources for economic, demographic and social data the pressure on national statisticians to conduct regular and consistent censuses has grown very rapidly. In much of the Pacific, the population census remains the single reliable source of demographic information.

Box 5.1

Continuity v Innovation in Meeting Census Stakeholder Needs

Because of the vital role that censuses play in the PICs, it is essential to ensure close cooperation with census users and to develop an appreciation of the limitations of the national census in providing quality data. While sample surveys can be sufficiently flexible in their design and content to meet the very specific needs of users, censuses, by contrast, are necessarily bound by past experience and precedents. For any given census, there is a need to balance new developments and the demands for the inclusion of new topics against the importance of consistency over time and very severe financial constraints. This conservative element in planning and conducting population censuses has, in its own way, further contributed to uniformity in their design and content.

By the mid-1990s, there was a prevailing sense of confusion in the National Statistical Offices (NSOs) regarding the conduct of the next census. Traditional areas of support were drying up, and dependable alternative sources were difficult to identify. The introduction of the Country Support Team concept into the Pacific had meant that the advisory services previously available from the UNFPA-funded ESCAP regional advisory services in population censuses and the population programme within the South Pacific Commission were both largely defunct. To be sure, technical assistance was available from the CST, but it was no longer possible for UNFPA to provide direct support for population censuses at the same level as in earlier years. While there may have been an expectation that countries would by now be self-sufficient in census taking, the small size of most of the PICs meant that for many reasons this development had not been possible.

Towards a Regional Approach

By the late 1990s at least two factors had been identified that effectively slowed progress in census taking and introduced the risk of making the 2000 round of censuses more difficult than the previous round. First, there was evidence that sources of funding were drying up. UNFPA and the more traditional bilateral donors were, for a variety of reasons, unable to maintain overall levels of funding to the Pacific and, at the same time, support from other donors for national population censuses did not enjoy the priority it had a decade before.

Secondly, the established processes of preparing for the 2000 round of censuses at the global level had largely neglected the views of the PICs themselves. In preparation for the 1990 round of censuses, for example, ESCAP held two census meetings, one exclusively for the PICs, to solicit views and recommendations for the region. In the past these views were reflected in the report known as the *Asian and Pacific Recommendations for Population Censuses (APRs)*. For the 2000 round, no regional meetings were held and the APR had not been revised to reflect Pacific problems. Although the Expert Group on the 2000 World Population and Housing Census Programme was convened in New York and revised the global *Principles and Recommendations* for Population and Housing Censuses, apart from the participation of the UNFPA/CST from Suva, there was no representation from the PICs.

Given these harsh realities, UNFPA, UNSD and UNFPA/CST Suva held extensive discussions during 1997 on the strategies that the PICs might pursue for the 2000 round of censuses. A useful model was the approach adopted by the Caribbean countries (CARICOM) for the 1990 round. The essential feature of this CARICOM approach was the development of regional census perspectives. Thus for the 1990 round, *inter alia*, a standard questionnaire was developed and common data processing services were made available. A similar approach was being considered by a number of Central Asian countries, where a joint census meeting to discuss the 2000 round had been held in March, 1997.

For the Pacific, it was agreed that a Seminar would be convened in November 1997 to consider a regional approach to census taking and to develop, as far as practicable, common strategies to achieve a number of important objectives. Such a meeting would provide a forum:

Supported largely by the UNFPA, two significant developments occurred that were to lead to a remarkable convergence in the approaches that the PICs adopted to census taking. These were:

- for the countries concerned to discuss and promote the importance of the 2000 round of censuses in order to determine the basic statistics required by planners and others for national and regional development;

- to discuss ways to develop more cost-effective methodologies and procedures that facilitate cost rationalization, bearing in mind the severe financial constraints already referred to above;

- to facilitate a high level of collaboration in the region through the adoption of common approaches to the development of census design, fieldwork, processing and utilisation that, apart from cost considerations, would contribute to improving overall census quality and maintenance of higher statistical standards;

- for agencies such as UNFPA, the UNSD, SPC and other potential donors and technical support agencies to understand more fully the joint needs of countries in the region, and to coordinate and network their financial and technical support activities.

A preliminary meeting was held in July 1997 in Suva, Fiji between the UNSD, UNFPA, SPC and the US Bureau of the Census: to consider the structure and scope of the Seminar, and the number and level of participants; to develop a provisional agenda; and to assign responsibilities for planning and conducting the workshop. During this meeting it was also decided that the opportunity would be taken at the forthcoming SPC Eleventh Regional Meeting of Heads of Statistics to promote the Seminar, but especially to apprise heads of NSOs of the importance of sound preparation and their roles during the Seminar in order to ensure its objectives would be met. In the event a special session was held at the SPC meeting to prepare for the regional census Seminar.

This regional census Seminar provided an important breakthrough in achieving overwhelming consensus on ways to rationalise census taking so as to reduce costs, raise the quality and improve comparability between countries. It was considered as important that representation should be at the highest level to give weight to the decisions made. In the event, agreement went far further than anticipated and, if mechanisms for effective follow up could be put in place, it could be claimed that recommendations from the Seminar provided the basis for a truly regional approach to censuses.

Opportunities for Reducing Costs

While many of these recommendations will clearly go some way to reducing census costs, it was also apparent that the meeting could make only a start in agreeing to a set of principles. Whatever was agreed, the major problems of financing the field operations, the testing, the mapping, the listing, the enumeration and the PES - all the elements that together make up the major costs of the census - would for

the most part remain. Thus, while cost reduction was one of the recurring themes of the discussions, setting out strategies that would lead to a regional approach to censuses was a more effective way to channel the energies of participants. Even though indirect, in the long run this approach is more likely to lead to sustained reductions in census costs. The recommendations that follow need to be considered in this light.

This chapter highlights some of the more far reaching recommendations from the Seminar, adding some comments as appropriate on the effectiveness of implementation in reducing census costs. The most important of these recommendations was to set up a regional census

TABLE 5.1: Summary of Recommended Core Census Topics and Questions

TOPICS	QUESTIONS
GENERAL	Place of enumeration Place of usual residence Relationship to head Sex Age Marital status Citizenship Religion School attendance Educational attainment
MIGRATION	Place of birth Place of residence five years ago
FERTILITY/MORTALITY	Children living at home Children living elsewhere Children who have died Date of birth of last child born alive
ECONOMIC	Work for pay or profit or in family business during past week
EMPLOYMENT	Engaged in agriculture fishing in past week with market orientation wholly subsistence Industry Occupation Status in employment Hours worked
UNEMPLOYMENT	Looked for work last week Available for work
NOT ECONOMICALLY ACTIVE	Reason for not working

network comprising NSOs and regional and international agencies. For most purposes, the regional inter-governmental organisation, the Secretariat for the Pacific Community (SPC). would serve as the focal point.

To ensure greater cooperation in census design, processing and analysis, it was seen as important that a core set of census topics and questions be agreed. Given the convergence already attained in most of the countries, the meeting was able to agree on a core set for both population and housing topics. These topics were based on current practices, but also took account of the requirements of the Minimum National Social Data Set that had been endorsed by UNSD. This core list was further refined in a follow-up meeting held in 1999. The plan was to develop a supplementary list of topics and questions that could be adopted by countries if they wished.

Box 5.2

Contributing to a Common Census Design

The agreement on a core set of topics and questions means that, in time, a common design will become feasible. In many of the smaller countries, the production of census forms and documentation is difficult as no in-country facilities exist. The recommended centralisation of regional technical support also means that common services such as printing of questionnaires and production of training manuals and other documentation can be provided, if necessary, by the central support group.

More immediately, cost saving can be achieved through the coordination of data processing. As a starting point, the regional meeting agreed that IMPS should become the standardized software for census processing. However, whether or not countries adopted IMPS they would still be part of the regional network. Already, this recommendation has led to significant economies as common software and training has been possible for recent censuses. Clearly, all regional and international agencies and donor countries are supporting the IMPS standard.

In time, the benefits of the regional approach should be felt more widely, and some of these potential areas emerged at the regional Seminar. With a common or near-common approach to census form design and content

and to census processing, the production of common tables could readily be achieved. The regional meeting envisaged a core set of tables that countries should be encouraged to produce, effectively improving comparability and providing opportunities for reduced costs. Taken one step further, common strategies could be adopted for analysis, at least for the production of the main census report. But even where countries adopt a different approach to analysis, say to meet the needs of particular agencies, the NSOs should be encouraged to document the analytic methodologies. Examples of particularly good analysis would be circulated throughout the region.

Improved and cost-effective data dissemination would also be encouraged on a regional basis. NSOs would be apprised of the most suitable media for data storage and transmission, again learning from the recent experiences of others. Technical support would be available from the regional secretariat and other participating agencies.

The regional approach adopted by the countries also helps supporting agencies to identify areas in which they may play a part. From a UNFPA position, for example, it may no longer be possible to support each country in the conduct of its census. But the support provided for the regional meetings has contributed significantly to the strengthening of regional cooperation. In the context of these joint efforts, intercountry cooperation should also be easier to organise. The regional meeting identified technical cooperation among developing countries (TCDC) and attachments of appropriate NSO staff to other NSOs in the region, as two possible approaches. Others include short-term attachments to SPC, the USBC or to other relevant institutions or agencies.

Comment

The Pacific Island Countries have moved rapidly to develop a regional approach to census taking. The efforts to work together have already produced more cost-effective approaches to censuses and should lead to improved quality. But the effort of organising a Pacific-wide census structure has more far reaching affects. It opens up many novel approaches and possibilities for further improvements and cooperation, not only in the South Pacific but among many developing countries, and it is these opportunities that provide the challenges for the future.

CHAPTER 6

NEW STRATEGIES TO IMPROVE THE COST-EFFECTIVENESS OF CENSUSES IN AFRICA

Richard Dackam-Ngatchou

Introduction

A population census comprises the entire process of collecting, compiling, evaluating, analysing and publishing or otherwise disseminating the results. The value of these demographic, economic and social data lies in their comprehensiveness and specificity in time and space, and it is these characteristics of the census, as distinct from a statistical survey, that constitute its major strengths, namely: everyone is enumerated, and the enumeration occurs at the same time, countrywide.

Most African countries still recognise the practical usefulness of a census, but these days the practicality of taking a census has been thrown into doubt because of the relatively high costs of the operation; and this problem is reflected in widespread defaulting on the ten-year periodicity by a number of African countries. An assessment of various censuses carried out in Africa has identified the following recurrent weaknesses in the process

- the high cost of the census as a data collection method;
- dependence on external funding;
- long delays in the publication of the results;
- the poor quality of the results in many instances;
- the high cost/utility ratio.

This chapter examines the nature of the issues that account for the high cost of censuses in Africa, and then outlines proposals that have demonstrated their utility in reducing the cost-utility ratio.

An integrated national programme for the acquisition of demographic and social data

A national programme of data collection can be expected to comprise a set of complementary collection methods implemented by the appropriate government agencies in order to provide stakeholders with needed data, indicators and related information. Such a programme undertakes collection in a systematic way, temporally and spatially, in order to meet the predetermined requirements for demographic and social data in the design and management of national, sectoral and regional development programmes.

The lack of coordination of an integrated demographic and social data collection system is commonly the main factor resulting in an ineffective national strategy of demographic and social data acquisition. There tends to be a proliferation of independent projects of data collection, often unrelated to any coherent national programme, and consequently, while there may be an abundance of data collection activities going on, they are producing poor quality and sometimes even contradictory data.

The census as a short-term project

In many African countries the population and housing census is viewed as a one-off, ad hoc project to be completed over a relatively short-term period. An ad hoc approach has a number of serious weaknesses including:

- little sense of ownership by the government;
- donor contributions often become difficult to coordinate efficiently;
- nationals perceive the project primarily as a means of developing the institutional capacity of the central statistical office (CSO) rather than as a tool to track programme progress;
- the institutional basis for undertaking a census is not permanent;
- there is little investment in staff training (including acquisition of appropriate advanced educational qualifications) for development of national capacity in the longer term.

The reliance on external funding compounds this problem since staff training cannot be scheduled as required, well ahead of the implemen-

tation of the census itself. Commonly, it is only when the project has already started, and the budget and funding finalised, that staff are sent for training, whereas it is precisely at that point that trained people are required. The staffing difficulties are often exacerbated because, as soon as the trainees return, they are frequently redeployed on other duties.

Although the census recurs on a predictable ten-year cycle, the project approach makes each census a discrete event with the consequence that:

- people who had acquired considerable experience with an earlier census have been moved on to other sectors where there experience may, or may not, be of relevance;
- lack of institutional capacity and maintenance of technical expertise may mean that previous experience is of limited relevance due to significant changes in the technology (notably in cartography and data processing);
- cartographic capacity has not been maintained through the intercensal period and outdated maps require instant updating;
- junior managers lack experience in executing large-scale data collection and processing, discouraging donors from contributing or hiring needed international experts.

Furthermore, it is not unusual for activities that should be part of the normal annual budget of a CSO to be incorporated in the census budget. Such routine items include the wages and salaries of permanent staff, maintenance of buildings, electricity and telephone charges, office supplies, vehicles, furniture, fuel, and other day-to-day expenses. The census, and possibly any other large, separately funded project becomes the principal source of financing for many routine statistical activities. Consequently, these large-scale data collection exercises, such as demographic and health surveys, household budget surveys and the like become essential to the CSO as a subsidy for normal operational budgets.

Administrative statistics

The national registration systems in many countries in Africa are far from satisfactory. Despite the fact that the registration of vital and related events has been recognised almost universally as essential for administrative purposes, and laws and regulations exist in most countries making registration of births, deaths, marriages and divorces com-

pulsory, these records are seriously deficient. Completeness of registration for most African countries is less than 90 percent. Unless governments maintain an official and complete vital or civil registration system, there are few alternatives for obtaining comprehensive population data other than a population census or large-scale survey.

Other official departments and agencies are supposed to provide statistics on health and education, but in African countries few if any administrative sources are capable of collecting or disseminating such data. As a result, the census provides virtually the only reliable source of information on family relationships and living conditions and their distribution throughout the country.

Length of questionnaires

African censuses generally include all of the core variables designated as essential in the United Nations recommendations: geographic, demographic, economic and social, educational, household and housing characteristics. Several evaluations of these censuses have suggested that they generally do not provide adequate information on economic activities. The informal sector in particular is not adequately catered for. Commonly there are just three or four variables collecting information on economic activities. In the 1993 *Population Census of Madagascar*, an attempt to fully utilise two questions, one on 'profession/occupation' and the other on 'branch of economic activity', accounted for a major part of the coding workload but finally resulted in the production of quite unreliable and inaccurate data.

Generally, in African censuses, questionnaires are not long, but even so, census outputs seldom represent the full potential of the variables included in the questionnaire, and this seriously increases the cost relative to the benefits of the census. Similarly, using a long questionnaire even on a sample basis to collect data beyond the basic population and housing information is rarely done in Africa.

Cost of fieldworkers

Fieldworkers' pay is usually the largest single item in the census budget. This component of census costs depends on the number of fieldworkers required at several levels: administrators responsible for the control of groups of supervisors; supervisors responsible for the control of groups of enumerators; and enumerators required to carry out the enumeration

of any one enumeration area. In Africa, enumerators are employed to actually fill out questionnaires during interviews with the households. This 'direct interview' method of data collection is necessary because of high illiteracy rates in the bulk of the population and the fact that many households do not have a literate family member. Consequently, all other enumeration alternatives that might be adopted to reduce costs (such as: telephone interviews, self-enumeration or postal returns) are not yet feasible for many parts of Africa. Furthermore, the telephone services themselves are not widespread in urban areas and are rare in rural areas; and postal services are not well developed.

The use of the direct interview method by enumerators not only increases the costs but also risks introducing errors of misunderstanding into the data collection phase. This use of enumerators is therefore one of the most significant factors in the high cost of the censuses. Even though they are not highly paid, enumerators commonly account for more than 30 percent of the cost of personnel. The greater the number of enumerators involved the greater the cost of supervisors, supplies, transport and other support services.

The proposal has been made to introduce the self-enumeration method into African censuses gradually, on the basis of an assessment of proportions of the population that are literate. For example, in a country where the literacy rate is over 50 percent, something of the order of 25-30 percent of questionnaires could be filled out by self-enumeration. The 1991 UN-ECA experts group proposed that regional population studies institutes initially test the local use of this method and evaluate its applicability before using it in any of the censuses.

Timeliness in dissemination of results

The cost of a census depends largely on the methodological approach adopted and the scheduling of the components involved in the process. There is widespread agreement that the protracted duration and escalating cost of the operation is often attributable to lack of an overview of what is involved in the many phases of the process and consequently in inadequate management especially of the technical aspects of the census.

The sequence of major census activities is as follows:

- preliminary work: administrative preparation including the legislation that constitutes the institutional framework of census implementation;
- design of the census: this mainly takes the form of detailed planning and documentation;
- technical preparation: choice of topics to be included, questionnaire design, development of the analysis / tabulation plan, cartography, elaboration of a guidelines manual, a pilot census, publicity;
- carrying out of the actual enumeration;
- a post enumeration survey;
- data processing;
- data evaluation;
- outputs delivery, including data analysis and dissemination.

It is essential that such a calendar should provide an explicit indication of the start and finish.

The length of the period of implementation has direct consequences for containing the costs of administrative management and the cost-utility ratio, since the longer the interval between the enumeration and the availability of the data, the less the usefulness of the results. To optimise benefits and timeliness, the procurement of computers and software must be well planned; so that data-processing is neither inefficient because of dated technology, nor delayed by unavailability of the requisite hardware or software.

Under-utilisation of census outputs

A number of factors contribute to the under-utilisation of censuses. In particular, these factors are likely to include:

- difficulties of accessing census outputs;
- inadequacy of the data due to lack of stakeholder involvement in the definition of the variables;
- non-availability of the data;
- availability of the data but curtailment of access to the information;
- unawareness of the existence of many outputs;
- absence of a customer service within the CSO;
- people do not know of the outputs nor how to obtain them;

- long delay between the enumeration and the dissemination of the outputs;
- for many applied purposes, outputs are obsolete after five years.

Inadequate preliminary work

In order to produce quality census output, there needs to be a comprehensive preparatory period during which as many tasks are possible are completed before the actual enumeration. In many countries, the funding allocated by the government is less than the total amount required to complete the entire census process. Unfortunately there is seldom any evidence-based advocacy strategy for resource mobilisation.

Many African censuses in the 1990 round completed only the enumeration phase. Official efforts to organise a census did not proceed as far as including data analysis nor to publication of information. One reason for this was the failure to recognize the continuity between data collection and data analysis at the design and planning stages. Complete separation of data collection and data analysis is completely inappropriate because of the synergies between data collection, data collection methods and data analysis. Similarly, the design of the post enumeration survey (PES) is often scheduled too late in the overall plan and, as a consequence, many PESs in Africa have been conducted but never utilised.

Major factors contributing to the high costs of censuses

The excessive cost of censuses relative to their utility in African countries can mainly be attributed to the following significant factors:

- absence of a recognized ten-year national programme of demographic and social data acquisition;
- limited political and resource commitment by governments that still tend to perceived the census as an ad hoc project;
- unreliability, incompleteness and inaccessibility of the relevant data from the civil registration system and other administrative sources;
- the protracted interval between enumeration and dissemination of census outputs;
- planning of the census fails to recognise and implement an efficient sequence of the component events;
- census outputs never match the full potential of the census questionnaire so that the cost-utility ration is very high;

- final outputs of many censuses are simply raw data and not processed information;
- financing from multiple external sources is not well integrated and allocations never cover the entire census process, partly because many work categories are omitted from the budget. In practice, many African countries (e.g., Benin and Senegal in 2002) have had to carry out fund raising during the implementation phase of the census;
- a good advocacy strategy for the mobilisation of resource is usually absent.

Strategies for the Reduction of Census Costs

For most of the countries of Africa the population census is still the main source of demographic and socio-economic data essential for planning and administrative purposes. Unfortunately, taking a census on a regular decennial basis is beyond the resources of many of these countries. There is therefore considerable urgency to reconcile this mismatch by reducing the cost of censuses while improving the cost-utility ratio.

Development of national programme of demographic and socio-economic data collection

To develop a national programme for the compilation of socio-economic and demographic data, it is necessary in most countries to rehabilitate and consolidate the coordination of the national statistical system. Population censuses, sample surveys, and other statistical data gathering should be developed as one part of an integrated national information system that functions throughout intercensal periods. This overall goal can be achieved through:

- establishing a coherent programme of data collection, analysis and publication;
- determining priorities among the objectives laid down for the collection of each type of data;
- defining the collection methods best suited to each type of data;
- promoting the complementary capabilities of various methods and sources to enhance the benefits for each operation;
- reinstating or introducing the collection of sectoral statistics to avoid overloading the census.

Box 6.1

The Approach Planned by Tanzania

Recognition has been given to the need for a clear sequence of national surveys in Tanzania, thus moving away from the 1990s pattern of ad hoc surveys. During the 1990s, ad hoc surveys were mounted primarily in response to specific requests from donors, with little attempt to coordinate a long-term series of surveys that responds to the needs and priorities of local data users. Although efforts were made to increase the use and comparability of the data from some surveys done between 1991 and 1996, further steps towards coherence are necessary. A planned and sequenced approach to surveys is being proposed. This will include the monitoring of indicators and variables which track and correlate with poverty. The framework for how this will be done outlines the overall sequencing of surveys, and the core set of poverty indicators from the Poverty Reduction Strategy for which data will become available during the next twelve years.

The Survey and Census Working Group has mapped these core indicators against the proposed sequencing of surveys to show the availability of data on these indicators over the coming twelve years. The process of mapping indicators across years and surveys enabled judgments to be made about the:

- optimal sequencing of the surveys;
- adequacy of the spread of data points
- history of each individual survey;
- capacity requirements for implementation.

Tanzania's poverty monitoring system based on the plan described in **Box 6.1**, is following an established schedule of data collection events as listed in **Table 6.1**.

TABLE 6.1: Sequence of Surveys and Censuses for Tanzania, 2001-2012

YEAR	NATIONAL SURVEY	YEAR	NATIONAL SURVEY
2001	X	2007	X
2002	Population and Housing Census	2008	Agricultural Survey
2003	Agricultural Survey	2009	Demographic and Health Survey
2004	Demographic and Health Survey	2010	Labour Force Survey
2005	Labour Force Survey	2011	Household Budget Survey
2006	Household Budget Survey	2012	Population and Housing Census

SOURCE: Tanzania, PRSP, 2001

Establishment of a permanent census bureau

One important development that can contribute substantially to the reduction of census costs is to institutionalise the census operating system by establishing a permanent census office within the CSO. Such a service takes responsibility for the on-going preparation, implementation and monitoring of census-related activities, including:

- the design, management and conducting of the census;
- the dissemination of the census products such as the data and information included in the data analysis report;
- the continuous updating of the cartographic requirements of the census, the setting up of computerized maps databases, generation of thematic maps and strengthening of the use of GIS; the promotion of the utilisation of census data for development planning at the national and sub-national levels;
- the production of the important complementary studies to basic census information such as regional monographs, demographic atlases;
- where possible, the establishment of permanent decentralized census offices (depending on the population size and level of development in a country);
- maintenance of the sampling frame required for samples surveys.

With a permanent census office, many recurrent, time consuming and expensive administrative and procurement processes are eliminated or reduced to normal routine, including: renting buildings and office equipment, identifying and hiring expertise, and even some of the logistical requirements. Experience and institutional memory preclude starting from scratch each time, as is virtually always the case for the 'census projects' approach. Even the period required for the preparatory phase can be shortened.

Improvement of the various official registers

There are many important reasons for identifying a strategy that will improve civil registration and the vital registration statistics in Africa. For instance, the new political and social environment characterised by the need to monitor the Millennium Development Goals (MDGs) and to provide the requisite information for good governance; requires the updating of the electoral lists based on reliable registers. The various sources of data are complementary for this purpose, and their reliable availablity could significantly reduce the cost of collecting related eco-

nomic and demographic statistics. The development of these sectoral statistics could also be expected to contribute to the reduction of the length of the census questionnaires. The broader the spectrum and sources of data, the more accurate and comprehensive the demographic, socio-economic or housing profile that can be developed, and full use should be made of existing sources, including administrative statistics collected routinely for a variety of purposes.

Advocacy needs to be capable of demonstrating that data is essential, whether in the form of statistics or other administrative information, and that the government will get good value for the resources invested in processing official register and administrative files, including the potential to reduce census costs. This is also a justification for the CSO having a regular, reliable and predictable budget in order to produce timely statistical information. If the production of statistics is an entirely government responsibility, then it might be expected that the costs of the census could decrease by as much as 15 to 30 percent, according to the estimates of some countries' CSOs.

Box 6.2

Making Full Use of Administrative and Other Statistics and Information

A wide range of data sources should be consulted, inter alia, official annual reports from ministries, national censuses and surveys, and databases from national statistics institutions and MDG reports. Existing data sources and reporting systems should be used where possible. Data collection is costly and often long term, and countries generally have very limited resources to develop and strengthen statistical capacity. Cost-effective and rapid assessment methodologies should be considered for additional data collection (CCA/UNDAF, May 2001).

Reduction in the length of the census questionnaires

If alternative means can be found for sourcing information and data, the reduction in length of census questionnaires could make it possible to increase the size of the enumeration areas in terms of the number of households that can be visited by each enumerator, hence reducing the total number of enumerators required. Other efficiencies can also be achieved by optimising the number of questions that can be pre-coded

and this requirement may also place a maximum on the number of variables included in the census in certain countries.

Generally, the acceptable average duration for the completion of a census from its initiation and planning to final publication of the results is five years. The recommendation of the regional technical support team of the UNFPA in Dakar is for an elapsed time of less than two years for the post-enumeration phase in order to provide information to users within a reasonable time.

A data analysis plan

Commonly, data analysis is not a component of the scheduled plan for the census in developed countries because there are numerous institutions, such as population institutes and universities, capable and willing to undertake in-depth data analysis. In many countries in Africa, however, only the CSO has the capability and human resources required for the data analysis required to transform data into usable information.

The objective of the data analysis plan is to facilitate and prioritise the work of all those involved in the post-enumeration processes: statisticians, data processing specialists, demographers and cartographers. The data analysis plan:

- ensures (well before the enumeration is undertaken) that the objectives of the census will be achieved if data collection is successfully carried out;
- determines the uses that will be made of each of the variables included in the questionnaire;
- provides for the preparation of the documentation required for analytical purposes; particularly for evaluation against external sources of data, comparative analysis, and the studies of change and trends;
- ensures that the analytical framework for the census is appropriate and guarantees that the specifications for the output provide for the full potential of the census data;
- enables the data processing specialists to determine ahead of time how the database will be constructed, what output will be produced, and to test the data processing tools on the pilot census;
- includes the useful contextual variables on health service centres, schools, and other community facilities during the pre-census mapping, as a prerequisite to generating thematic maps;

- enables each analyst to adopt a guide for self-direction on the topic that each is analysing; analysis designed on the basis of the draft questionnaire provides a good, on-the-job training tool, available eighteen months before the actual analysis is likely to commence;
- schedules the publication of data, statistics and information;
- provides the necessary rationale for evidence-based advocacy to secure the mobilisation of resources from an early date.

This approach has been applied in the case of some recent, successful censuses in Africa. These include: Benin (1992), Chad (1993), Guinea (1996), Côte d'Ivoire (1998) and Cape Verde (2000). Lessons learned from theses censuses show that, using the data-analysis plan as soon as the draft questionnaire is available, increases the cost-effectiveness and the cost-benefit of the census; and reduces the period between the enumeration and the availability of the final products (information, publications and other products beyond data).

Census outputs as an advocacy tool for the mobilisation of resources

In this instance, the purpose of advocacy is to persuade the partners to contribute to population census fundraising. Many potential donors are not aware of the extent of census outputs. Generally, the targets of advocacy are the government, the local administrative authorities, stakeholders in the private sector, and external donors.

Advocacy to achieve the mobilisation of resources for the census requires publicising of the following themes at an early stage of the census process:

- a comprehensive list of the census outputs;
- the census schedule showing that all expected outputs will be available in a timely fashion;
- a strategy to ensure minimal expense and expeditious execution of the census;
- the set of data and indicators needed to update the various databases or databanks;
- the benefits for each key stakeholder in terms of information;
- the capacity of the census to fulfill unmet information needs such as ICPD, MDG or CCA/UNDAF indicators;
- the capacity of the census to provide indicators for evaluating country population programmes;
- a plan for optimal dissemination and utilisation of census products;

- evidence of government support and commitment;
- the contribution expected from each key stakeholder.

Some donors decide to contribute to the census only after being advised of the census outputs. The UNICEF, for example, decided to support the censuses in several countries only after being convinced that the outputs would enrich their 'Child-Info' database at all geographic levels (Burkina Faso, 1998; Cote d'Ivoire, 1998). In some other countries, the ministries of health or for the empowerment of women also contributed to advocacy for resource mobilisation (Guinea, 1996).

The analysis plan is a powerful tool for evidence-based advocacy promoting resource mobilisation. The plan provides a synoptic table of the indicators (by topic and geographic level) utilised for the national and international programmes that will be produced at the end of the analytical process transforming the data into indicators and other useful information. Advocacy can also be used to demonstrate that the census method expands and consolidates the national capacity for data collection, data processing, analysis and dissemination of demographic and social data, indicators and information.

Box 6.3

Publicity and Advocacy for Censuses in Africa

The broader issues of advocacy have been addressed in an operational manual compiled by the UNFPA Country Technical Services Team in Addis Ababa. Despite the relatively long history of census taking in some African countries, undertaking a national population census still constitutes a serious challenge. In addition to the institutional and technical constraints discussed elsewhere, the support, cooperation and participation of citizens in census exercises has been most inadequate in many countries, often due to internal issues such as resource allocation and sectional representation. This situation tends to politicise the census process and detracts from both the response to and faith in the census and its outputs. The manual discusses strategies for securing the support, cooperation and participation of citizens in their national censuses of population and housing.

SOURCE: UNFPA (2002b).

Reduction in operational costs

Reduction in the costs of a census can also be achieved by improving implementation of the various phases of the operation, from design to dissemination.

A pilot enumeration This is an opportunity to test and refine the operation, to amplify and clarify the technical documentation, the controls, the management for all the components that will follow right through to the enumeration, and then also for the post-enumeration procedures.

The enumeration The strategy that aims at reducing the cost of enumeration also implies imposing some limitations on the objectives of the census. This can most readily be achieved by a lessening of the workload in the form of a short questionnaire with, as a consequence, a reduction in the number of the enumerators required or an increase in the size of the enumeration areas. Field personnel should be recruited and paid on the basis of a regular salary rather than on a per diem basis as the latter is likely to be much more expensive.

Logistics Leasing and borrowing equipment for the requisite period within the census operation can greatly reduce costs. Accessing existing national or regional resources owned by central or local government can be particularly cost efficient. This strategy can be especially effective for short-term or intermittent usage, as in the case of transport. Use of official vehicles in this way made the 1998 Burkina Faso census the cheapest in Africa.

Data processing Reduction in the cost of this important component of the census operation involves a number of basic issues, in particular:

- limiting the number of questions in the questionnaire;
- adopting a methodology that provides for as much pre-coded questionnaire processing as possible:
  - to reduce the workload;
  - to limit the manpower required for coding;
  - to minimise expenditure on data-processing equipment;
- using techniques such as optical character reading that accelerate data entry;
- developing a schedule of data-processing procedures early in the planning process, and observing it throughout;
- adopting software tools and procedures that allow as much autonomy as possible in the production of tabulated data.

TABLE 6.2: Modifications and Alternatives to the Conventional Census

THE OPERATIONAL METHOD	APPLICABILITY IN AFRICA
• *Micro-census or sample survey where the survey sample is less than 10 percent* *Sample survey where the survey sample is greater than 10 percent*	A sample survey cannot replace a complete enumeration particularly in view of the constraints of the national system of demographic and social data acquisition in supporting the process. These methods do not provide information down to the level of all administrative units in a country; they do not enable adequate profiling of rural localities and villages. **APPLICABLE BUT NOT ADEQUATE**
• *Combining the census with a survey where the traditional census is administered using two questionnaires: a short questionnaire for the basic census items responded to by everyone, and a longer questionnaire for the sample survey*	This method is recommended in several countries in Africa in order to capture and analyse population change and trends (South Africa, Madagascar). There are problems: such as sampling for the survey before having the detailed information to establish a sampling frame; and this introduces a second data set and sequence for processing in parallel. **APPLICABLE BUT NOT ADEQUATE**
• *Short census: very few topics are covered*	The number of topics depends on the circumstances. Since the administrative and civil registration systems are neither reliable nor complete, they cannot be used in a supplementary way. Unmet demographic and social data needs are a major obstacle to this approach. **APPLICABLE BUT NOT ADEQUATE**
• *Combining register data with a sample survey*	Combining some types of administrative (e.g., school) statistics with the survey data may be successful, but becomes very complex with regard to the registers of employment or even those of health, which are neither reliable nor complete. **APPLICABLE BUT NOT ADEQUATE**
• *Short census combined with an exhaustive exploitation of the civil registration for the reference year*	The civil registration system and administrative registers are neither reliable nor complete. **APPLICABLE BUT NOT ADEQUATE IN THE NEAR FUTURE**

THE OPERATIONAL METHOD	APPLICABILITY IN AFRICA
• *Civil registration combined with a sample survey*	Suffers from the same shortcomings as noted above. **APPLICABLE BUT NOT ADEQUATE**
• *Permanent registers of population*	Experimental application in population laboratories has given good results (Sine Saloun, Niakhar in Senegal). Not possible to implement at the national level. **APPLICABLE BUT NOT ADEQUATE**
• *Enumeration progressively by region in rural areas and by sampling in larger urban centres*	Two methodological obstacles limit the adoption of this methodology: determination of a date of reference, and the inability to measure internal migration. This type of enumeration distributes the costs in time; but does not reduce the costs. **APPLICABLE BUT NOT ADEQUATE**
• *The 'renovated census' of INSEE, France, and the rolling census*	This method is still at the pilot stage. Applicable where alternative data sources are reliable (Europe or North America). The real objective of the census has to be, not to test the method but, to give useful outputs. **APPLICABLE BUT NOT ADEQUATE**
• *Census by self-enumeration requires households to complete the questionnaire themselves*	Requires the population to be largely literate. Difficult to implement this method when the illiteracy rate exceeds 50 percent in the adult population in most countries. The method had not been tested; it is difficult to identify in advance the households ready for self-enumeration. **APPLICABLE BUT NOT ADEQUATE**

Box 6.4

Optimising the Cost/Utility Ratio

A number of simple measures can be taken that ensure that the census outcome is positive and worthwhile.

Inclusiveness: It is highly desirable that all the main users groups should be involved and consulted in the process of selecting topics to be incorporated in the census questionnaire. Potential users in the public sector, among local authorities, the private sector, NGOs, universities and research institutions, need to be informed of the advantages and the limitations of the census.

Meaningfulness: The census questionnaire must focus primarily on the real information needs of the society and the provision of information to facilitate development. The census is a huge waste of time and resources if the main users are not provided with the information they require.

Practicality: The methods used for data collection, processing and analysis should be practical, well-known, and widely tested. This is then a means for ensuring that each of the stages of the process is carried out efficiently and competently and that the eventual output is accurate, clear and as usable as possible.

Advocacy: The census questionnaire must focus primarily on the real information needs of the society and the provision of information to facilitate development. The census is a huge waste of time and resources if the main users are not provided with the information they require.

Creativity: Promoters can demonstrate to stakeholders and other potential users the usefulness of the census in providing new data, new approaches and new perspectives on the issues that command people's attention, such as:

- mapping national poverty;
- synoptic information for tracking the millennium development goals;
- indicators on the status of women and related gender statistics;
- indicators describing the status of children including: orphanhood, participation in schooling, economic activity;

Timeliness: A major concern for most users of statistical data is the currency of the information and that delivery of new data drawn from the census is delivered in a timely fashion; a failure to achieve timeliness in the release of information not only worsens the cost/utility ratio of the census but results in a disenchanted clientele and group of stakeholders.

Box 6.5

Recommendations for Key Census Stakeholders in sub-Saharan Africa

- support the development and the implementation of a national and ten-year demographic and social data collection programme;
- schedule and regularise the intercensal surveys;
- reinforce the complementarity of data sources and improve the administrative registration system: civil registration, school statistics, health statistics;
- encourage the utilisation of government and local administration equipment and vehicles, particularly for the census enumeration stage;
- promote South-South cooperation and harmonise the methodology and the periodicity at the sub-regional level;
- promote the permanent establishment of census bureaus within CSOs;
- encourage urban households, where most households have a literate member, to undertake self enumeration;
- develop and schedule the analysis plan as soon as the draft questionnaire is available;
- undertake evidence-based advocacy for resource mobilisation;
- improve the cost/utility ratio by providing census information for GIS mapping including thematic maps;
- ensure all preparatory work for the census is result based; that is, keep clearly in view the required output objectives.

Data analysis, dissemination and storage

The development of the plans for data analysis and specifications for the content and structure of tables to be produced are an essential part of the preparatory phase, and carried out competently from the beginning can save time and cost. Equally critical is completion of the necessary training of the team of analysts and the organisation of workshops to provide for consultation that will optimise the quality of the information outputs and achieve a favourable cost/utility ratio for the census overall. Recourse to micro-processing and use of electronic media (CD-Rom or DVD, internet sites) for dissemination implicitly brings a number of other advantages: better storage without loss of information; greater information storage capacity; and reduced storage cost.

South-South cooperation

Cooperation at the sub-regional level within Africa can contribute significantly to cost reduction. The Central African Republic (1988), Chad (1993) and Equatorial Guinea (1995) all made use of what is effectively regional, or South-South, cooperation to facilitate and improve their censuses. Neighbouring countries, with particular strengths and areas of good practice in their own censuses lent their expert staff for short periods (usually just one to two months) to assist the recipient country with the processing of output (Chad) or data analysis (the Central African Republic and Equatorial Guinea). UNFPA has provided the catalyst in implementing these arrangements which have had a very positive impact on the development of national technical capabilities through on-the-job training. This strategy also goes some way to mitigating the absence of 'institutional memory' that is a consequence of the high level of staff turnover within this region.

The Southern African Development Community (SADC) approach demonstrates that by standardizing and harmonising the census methodologies; experience and expertise can readily be shared, delays reduced and costs minimised.

Only a population census can give accurate and reliable data and information on the population for each geographic level of the African countries. Alternative methods are not feasible and other sources are not avail-able in sub-Sahara Africa, and cannot be anticipated in the near future. 'The census is the unique source of information for data on specific populations and sub-populations poorly represented in household surveys'.

CHAPTER 7

AN ALTERNATIVE STRATEGY FOR DEVELOPING COUNTRIES: COMBINING SURVEYS AND CENSUSES

Philippe Pommier

Finding an Alternative to Ten-Year Population Censuses is Essential

Observation

For over fifty years now, international recommendations on the collection of statistical data have advocated that, as a minimum, countries should conduct a five-year census of production and a ten-year census of population. These recommendations can be interpreted in different ways.

The **first interpretation** requires that data collection based on surveys should have a proper sampling frame, and that international recommendations for population censuses should be regarded as the minimum standard of periodicity for updating sampling frames, irrespective of the method adopted.

In the area of production / business statistics, this first interpretation has prevailed for a long time in a great many countries. Managing and updating a directory of companies and their units is acknowledged to be of prime importance, with data collection being carried out by means of periodic surveys using stratified random sampling. For large units, surveys are exhaustive and conducted on an annual basis. Medium-sized units are also surveyed annually but sampling fractions are a function of the number of units per stratum. Very small units are often surveyed on a multi-year basis (commonly every three to five years). Countries that have adopted this approach are generally considered to have succeeded in setting up an effective information system.

By contrast, countries that have confined their data collection to five-year censuses have commonly failed to set up a useful information system since, with the exception of the wealthiest countries, preparing and exploiting these censuses absorbs most of their resources.

The **second and more comprehensive interpretation** contends that the exhaustive collection of fundamental data for all observation units is required in order to measure any socio-economic structure properly, since sample surveys can be used only to supplement existing information and assess changes. In the area of demographic and social statistics, this second interpretation has always prevailed, since setting up and updating sampling frames was, for a long time, regarded as an obstacle that could not be overcome without first conducting censuses. The consequences of this are well known.

Box 7.1

Population Census Costs Are Exorbitant

In terms of overall annual budgets for national statistical systems, the cost of taking a census is extremely high:

- **between 1 and 1.5 times the annual budget in European countries;**
- **between three and five times in intermediate Latin American countries;**
- **between ten and twelve times in sub-Saharan African countries.**

These estimates, contributed by Directors of National Statistical Offices, demonstrate:

- **the large expenditure that censuses entail;**
- **the extremely modest size of budget allocations for statistical purposes;**
- **the impact on census budgets of the periodic need to re-equip National Statistical Offices.**

Data on costs also reflect the tendency for decennial population censuses, often under the pressure of demands by donors, to provide the survey mechanism for collection of all types of social data, rather than remaining simply population censuses. A major consequence is that it is virtually impossible to conduct censuses in developing countries without the external funding that is becoming increasingly difficult to obtain.

Aside from budgetary aspects, what is more serious is the fact that the ***burden*** of preparing, conducting and exploiting a census greatly exceeds the ***capacity*** of most National Statistical Offices (NSOs). The impact of this is twofold: many censuses are still poorly or inadequately exploited for the analytical information they can provide and therefore wasteful of resources, and many NSOs now lack the capacity to develop and conduct fundamental and sustained statistical work.

On the basis of these observations, French cooperation services decided over ten years ago to stop promoting and funding the conduct of population censuses, and have been pressing statisticians in developing countries to study alternative options. To do this successfully ***it is necessary to rethink the social and demographic data collection system as a whole***, in terms of both surveys and censuses, by identifying the optimal combination that can be designed to collect all essential demographic and social data.

A new paradigm

Recently, it appears that attitudes to the French suggestions have begun to change. Officials are becoming more aware of the rapidly changing situation resulting from debt reduction initiatives for heavily indebted poor countries and the implementation of Poverty Reduction Strategy Papers (PRSPs).

The impact of these changes on statistical systems and on the external support they may receive from international, bilateral or multilateral donors, is analysed jointly by the donors and their partners within a consortium created under the framework of the PARIS21 initiative. Through PARIS21, all partners have been made aware of the following three major changes:

- PRSPs should include a programme for strengthening their information systems, and their statistical systems in particular, since implementing development and poverty reduction policies calls for effective information systems;

- the funding of statistical systems should be borne by national budgets from the margins released by the debt reduction initiative and from the overall budgetary aid provided by the donors;

- the funding of statistical data collection and processing by external donors will soon come to an end. The remainder of 'project' aid, part of which will have been transformed into overall budgetary aid, will focus on support for statistical capacity building in the form of equipment, training, provision of expertise and pilots of methods suited to data collection and processing.

The impact of these rapid changes on demographic and social statistics will be of fundamental significance. During the first phase of a PRSP's elaboration, the results of a recent population census and of a large-scale survey of personal consumption would doubtless be very useful, where available. However, when implementing development and poverty reduction policies and assessing their impact, these data soon prove totally inadequate. It is essential, therefore, to put in place a permanent system for conducting household sample surveys. This is one of the objectives of the strategic programmes to be elaborated by countries for strengthening statistical systems.

This elaboration is subject to constraints both in terms of resources and funding. It will soon be apparent that, except in rich countries, the setting-up and implementation of survey programmes are incompatible with the conduct of large-scale periodic censuses, irrespective of whether these are population, economic or agricultural censuses. Comprehensive statistical systems must be designed to prevent any major peaks in funding requirements or the use of staff and computer resources.

Pragmatism Dictates Adoption of an Alternative Solution

There is now a pressing need to find an alternative to large-scale periodic population censuses so as to set up the sampling frames that are essential for household surveys. This would make it possible to break the current vicious circle of necessarily large-scale and costly censuses. In the absence of a coherent sample survey system (a lack due largely to the fact that all available resources are absorbed by censuses taking), censuses are expected to achieve too broad a range of objectives.

If it were possible to set up sampling frames independently of censuses, it would then be possible to build a coherent survey system as a matter of priority. This could, possibly, be supplemented by a small-scale population census, should it prove essential for meeting highly specific requirements.

Creating sampling frames without censuses

The solutions adopted by the few developed countries like Sweden which have succeeded in doing away with large-scale periodic population censuses or, as undertaken by France, in transforming them into continuing censuses, rely on the extensive use of administrative files. Clearly, these solutions are totally inapplicable to developing countries, particularly to African countries.

A solution therefore needs to be sought by exploring a completely different approach. Initially, this must involve evaluating alternative techniques for selecting representative samples for household surveys.

Random sampling for household surveys is, in practice, always an area or geographic sample. To start with, a random sampling of settlements is carried out; followed by a second random sampling of the chosen observation units, such as dwellings, households and individuals from within the sampled areas. Any solution must therefore contain both of these elements, that is: ways of setting up and updating a sampling frame for settlements; and ways of extracting a master sample, and identifying the observation units in the settlements chosen from the master sample.

Stage One: Setting up a sampling frame within settlements

A sampling frame is essentially a list of all the units from which information is required. It needs to be kept up-to-date. Three key elements need to be determined: a listed of settlements, stratification variables and weighting variables.

A list of settlements needs to be drawn up. What is a settlement? It is a delineated unit centred on a village in rural areas or on a district in urban areas within the national territory.

What stratification variates should be chosen? Selected variables should be easily observable, and identify settlements independently of their inhabitants. These are the sort of data that in France are found in the inventories drawn up by communes. They would commonly indicate whether there is a school, a medical centre, a company registered with the tax authorities, a water hole, distance of the settlement from a surfaced road, whether there is a connection to the power network, if there is a market, and so on.

What weighting variate should be chosen? At least one is needed. The simplest one to obtain is probably the number of dwellings.

Simply itemising the list is insufficient. Once it is drawn up it must be updated regularly.

Initially, settlements are recorded and identified using a non-significant identifier. Next, it is necessary to identify and include in the list the data corresponding to the stratification and weighting variables. This is most readily carried out by sending one or two investigators to the settlement to interview the local authorities, other administrative and traditional authorities, teachers, religious representatives, and similar people.

Updating the list should be a continuous process, with about 10 percent of settlements updated on average every year. Updating should take place more frequently (perhaps every five years) for areas experiencing high levels of migration or characterised by high-density populations, usually characteristic of urban areas and especially urban peripheries, and less frequently (maybe every twelve years) for rural areas. Countries in the process of conducting population censuses should capitalise on the opportunity and create such a list as a by-product of the census. The recommendation could be made to countries which have failed to marshal the resources needed to conduct population censuses that they utilise such resources as are available to draw up the list of settlements instead.

This proposed solution is not new. This method has already been implemented successfully in a number of countries (where they were commonly termed 'village files'), most notably in Togo - a country that adopted this solution as a substitute for a population census in order to conduct an agricultural census[2].

Stage Two: Extracting a master sample

Once the list is drawn up, it is necessary to extract a master sample in the form of a stratified random sample carried out independently of the settlement list updating plan. The master sample can be used for any number of years, five for example, and the appropriate proportion (a fifth in that instance) revised annually. When a settlement is incorporated in the master sample, two further important steps must also be implemented:

- an accurate and detailed map of the settlement must be prepared;
- individual dwellings must be located on the map, each with a unique identifier.

Building a coherent sample survey system

One effective strategy is to start with a periodic survey of employment at the core of the network. The survey would be conducted across a selected group of dwellings. During the first visit, the demographic data on the composition of the households living in the dwellings would be gathered along with the data on the occupants' formal or informal employment.

During subsequent visits, only employment data would be gathered. To measure change, at least two visits should be scheduled a year apart. To observe current trends, five visits should be planned at three monthly intervals and during one of the quarters the one-fifth revision of the selected group should be implemented. This core survey would be supplemented, every four or five years, by surveys of the informal sector, consumption, and other significant variables. In addition, variable modules concerning living conditions, health, education, migration, and the like, could be included in the core survey.

Should supplementary censuses be planned?

Sample survey systems allow the gathering of all the required data with an accuracy close to that of censuses, as long as one is not seeking information at a fine geographical level. If the gathering of information at the finest local level is of high priority, it is necessary to supplement survey systems with a small-scale population census involving simply a sex and age group count. This simple census might be supplemented with a few more simple variables, but the main consideration is to avoid the necessity for individualised schedules. Such a supplementary census could be conducted as a rolling census, with each settlement or set of settlements being surveyed during a given month over the ten-year period. The settlements that are to be integrated into the master sample and the other samples will thus be processed differently.

For the settlements being integrated into the master sample, the census should take the form of a complementary survey conducted when the settlement leaves the master sample, and involve only those dwellings that were not selected for one of the surveys. For those settlements

which are not to be integrated into the master sample, the supplementary census could be conducted when the list of settlements is updated.

Accepting the Challenge

This proposal offers a realistic solution to the challenge of finding an alternative strategy to conducting censuses for monitoring the population. The great advantage is that it enables the management of a coherent household survey programme by eliminating all the discontinuity and pressure of fluctuating workloads and funding requirements that currently confronts so many NSOs.

Box 7.2

Weighing Up the Adoption of Structured Sample Surveys

Several countries in the Americas are very interested in this approach and asked for it to be a priority theme during the next regional seminar organised by PARIS21 in Bolivia. Colombia even volunteered to try out the scheme on behalf of the Andean States. Nevertheless, because this approach runs counter to a well-established tradition it is inevitable that there will be considerable resistance, and in particular there is likely to be a great deal of reluctance among the countries of Africa.

Two important considerations must be addressed if this alternative strategy is to succeed. This proposal will be worthwhile only if implemented ***with continuity over a long period of time***. The question is therefore whether NSOs in developing countries are operating on a sufficiently sound basis to ensure such continuity. Complementing that proviso, is the implication that donors too must be prepared to commit themselves to long-term programmes. Currently, most donors almost invariably prefer to promote projects within a well-defined time frame. Secondly, for this solution to succeed ***genuine expertise and competence are essential*** in the fields of statistics, methodology and management at a more advanced level than that needed to conduct censuses. Do all countries have such a capacity?

If countries and their sponsors jointly decide to follow such a path, it would be most desirable to make provision for two important prepara-

tory measures. First, the creation at a sub-regional level of centres of expertise support countries in the implementation of the requisite techniques, Secondly, the establishment of an experiment in a few countries (say, in a French-speaking and an English-speaking country in Africa) since many NSOs, quite rightly, are sceptical of the workability of this approach and will not choose that path without proof that this solution is feasible in their particular environment.

French cooperation services recommend to all their partners that they fine-tune these proposals together. A consortium of donors including UNDP, UNFPA, the World Bank and the IMF, could be formed to fund pilot projects in two or three African countries. The countries that volunteer to carry out these pilot projects would have two advantages from participating at the pilot-project stage: firstly, they would be assured of significant external funding support; and secondly, they would gain a substantial methodological and experiential edge and themselves become the nuclei of future centres of expertise. France, for its part, is prepared to provide full backing, both financially and by providing a small group of experts, for those countries that choose this path.

CHAPTER 8

STRATEGIES FOR CENSUS TAKING IN POST-CONFLICT SITUATIONS: AFGHANISTAN AND CAMBODIA

Graham C. Jones / Laurence Lewis

Whilst the title of this chapter might give the impression there are census strategies that could be applied in post-conflict situations that were essentially different from more typical approaches to census taking, this impression would be largely false. The same principles always apply, but since there are wide variations in the circumstances and needs of countries in post-conflict situations, it is essential that these are fully understood and appreciated prior to approaching what is the largest single data collection exercise that any statistical office ever undertakes. Consequently a more analytical approach to understanding the circumstances and needs of countries in post-conflict situations opens up opportunities to learn from national, UNFPA and other experiences, and these can provide important pointers for guidance as new situations arise.

Given these circumstances, looking at only a small number of cases entails the risk of identifying issues that might prove rather arbitrary in the task of extracting important lessons for others. However, the approach adopted in this chapter is to cite Afghanistan as the main case, and this example enables important issues to be raised and distinctions and similarities to be drawn with other post-conflict census situations, especially that of Cambodia.

The Role of the Census in Post-Conflict Reconstruction

The most important task of any census is to provide timely, relevant, quality information, which will inform decision-making. In a post-conflict situation this is brought into even sharper focus as there may be:

- no other data available at all;
- data may be substantially out of date;
- data may be of extremely dubious quality.

In the case of Afghanistan, where there has been war for 23 years and no nation-wide census conducted since 1979, the census becomes much more critical than in situations where censuses have been a regular feature of the activities of the appropriate Central Statistics Office (CSO). Furthermore, one of the major issues in any post conflict environment where there is no quality information is the immediate proliferation of small, always well-intentioned surveys, which often conflict with one another in the substance of the data collected. The international agencies and donor communities need quality data, and strengthening the CSO's capability in this respect should be a coordinated effort amongst those concerned. Regrettably this is often not the case, causing a greater demand than can be fulfilled by the scare resources available, and even threatening to sabotage the major projects. Nevertheless, there is general agreement that the census plays a vital role, not just in the provision of information central to reconstruction and development projects, but also in the establishment, or re-establishment, of essential government institutions.

In both Cambodia and Afghanistan, the transitional governments representing all major political parties, were in no doubt about the need for a census in each country as a starting point for reconstruction. Indeed, during the first UNFPA technical mission to Cambodia in the early 1990s, the census was identified as the most important contribution that UNFPA could make to national development. In the case of Afghanistan, under the 'Agreement on Provisional Arrangements in Afghanistan Pending the Re-Establishment of Permanent Government Institutions', known as the Bonn Agreement, the United Nations was mandated 'to conduct as soon as possible':

- 'a registration of voters in advance of the general elections that will be held upon the adoption of the new constitution by the constitutional Loya Jirga';
- 'a census of the population of Afghanistan'.

In Afghanistan, which was faced with the dilemma of linking the census with a post-conflict election, the approach has been rather different

Box 8.1

Issues of Contamination by Association

Somewhat contentiously, the post-conflict census is likely to be linked to the need for an early election, especially where there are no data available on population size and distribution. This was the case for both Afghanistan and Cambodia. The view taken by any agency in such circumstances needs to be carefully considered and the UNFPA is no exception. At the time of the Cambodian census, the widely held belief that contamination from the elections could possibly impact on the accuracy or the general perception of accuracy of the census bore heavily on the decision of UNFPA not to be seen to participate in the election process. Consequently, the decision was made to strengthen the capacity of the CSO during the early post-conflict period and to conduct the census after a period of four or five years, long after the conduct of the elections.

from that in Cambodia, but necessary in maintaining a distinct operational distance between the two activities. In this instance, the Afghanistan CSO, with the help of UNFPA, has devised a two-phase census. In the first phase, the CSO will concentrate on undertaking a household listing and village facilities survey in order to provide much needed basic data in advance of the election process. This will be followed, in the second phase, by the census proper well into the post-election period when it will be free of any possible contamination.

In the immediate post-conflict situation, practical considerations hold sway in dictating the priority to be accorded the census for early reconstruction and the opportunity to take advantage of the focus on resource mobilisation. By working in parallel with the election authorities, the donor communities can readily perceive the desirability of succeeding in both these ventures in order to secure the future of the country. For example, the experience gained in undertaking fieldwork for the household listing is invaluable to those responsible for voter registration, particularly with respect to logistics, transport, and availability of resources in the provinces.

Strengthening Statistical Infrastructure

Developing the statistical infrastructure is a complex issue vital to any decision to proceed with the census. In both Cambodia and Afghanistan, the lengthy absence of census and survey operations in the country had led to what appeared at first to be the near total col-

lapse of the national statistical systems. In Cambodia, few of the statistical staff had worked on the last census conducted in the 1970s. Equipment in the statistics office consisted of two typewriters, one using Russian script, the other French and neither working well. In Afghanistan, the general appearance of the statistical office was similar, with little in the way of furniture or office equipment to show for the past twenty years. Again, the last census was conducted more than twenty years ago, and even that census had to be abandoned as a result of hostilities.

There was one important difference between Afghanistan and Cambodia. Unlike Cambodia, a surprisingly large proportion of the statistical staff in Afghanistan had worked on the 1979 census and had retained a sufficiently strong sense of professionalism to convince UNFPA and other donors that they could, with the right kind of training, provide the core staff for a modern census. Early in 2003, it is still too early in the process to say with assurance that a reliable census is possible. The census in Bangladesh in 1973, for example, following its war with Pakistan, was very disappointing. So too was the 1979 census in Vietnam. But it is believed the failure of these two censuses was attributable to poor design and organization rather than to the quality of the staff. Indeed, with improved management and design, the UNFPA-supported 1989 census of Vietnam can be included among the most successful in any country.

Another aspect of human resources essential to the success of a census relates to statistical infrastructure at the sub-national level. In both Cambodia and Afghanistan, little such infrastructure existed outside the capital city. In Cambodia, the phased development of the census enabled significant improvements to be made to sub-national statistical system prior to the main census. In Afghanistan, assuming the census proceeds more or less immediately, it will be necessary to incorporate the development of provincial and lower-level statistical offices into the census strategy. Essentially this will be done through re-deploying staff trained at headquarters in the provincial offices. Over time, selected district offices, staffed from headquarters, will be opened within each province and function as the focal points for census enumeration and field training.

As no survey work of this sort had been conducted in the provinces since the late 1970s, it was important to determine whether or not the schedule for conducting the first phase would stand up to field testing. By operating outside the capital, Kabul, not only was an important political message being sent, but the reliability and efficiency of communications and logistics would be fully tested. In addition, by moving into a provincial capital, the first steps would be taken in developing the necessary capability to operate outside the capital.

Box 8.2

A Cautious Approach, by Pilot Enumeration, in Afghanistan

The challenge in Afghanistan is to maintain sufficient resources at each level to be able to undertake the census successfully. Whilst there are those with extensive practical experience from working on the census in 1979, they are few in number, particularly at management level. Hence the decision to adopt a low-key approach and to proceed with only a small number of persons in the pilot phase. Building on the experience gained in the 1979 census is central to the approach being adopted. The province of Kunduz in the north of Afghanistan was chosen for the pilot enumeration in the first phase. This province had the advantage of being in a part of the country that was relatively secure with mild, predictable weather, unlike the harsh winter climate that in some seasons can be most disruptive.

When the pilot enumeration in Kunduz has been completed, the staff will form the field management team for the first phase proper to commence in the provinces. Again, this will be 'slow ramp' so as not to overstretch resources and capabilities. Maintenance of quality will be critical in sustaining the confidence in the results of the government, international agencies and donors, and for this reason, adequate supervision and evaluation of all phases are essential. As this chapter is being written, the pilot phase in Kunduz is drawing to a close. The portents are good. The maps have been well drawn and are a valuable management control tool. The forms designed by the CSO have worked well and require only minor revision. The resources provided have, in the main, proved adequate but there are issues in respect of reporting and communication that need to be addressed.

To ensure the mobilisation of the necessary human and other national resources for the census, it is essential to recognise that, in circumstances such as these, it is impossible for the NSO to conduct the census on its own. The programme for in-country training of staff must therefore reach beyond the census organisation. The remarkable success of the 1989 Vietnamese census can largely be attributed to the heavy involvement of provincial and regional staff from other permanent departments and agencies. The establishment and efficient operation of census-steering and coordinating committees is the key to ensuring that the census is perceived as a truly national undertaking.

Following this strategy in Afghanistan, there is a high level Ministerial Committee chaired by the Vice President, which also includes a wide ranging membership not just of those likely to be users of the census, but also those who can provide assistance in the field. In addition to this influential and broadly representative group, there is the absolute necessity of generating a good working relationship with each of the provincial administrations. In Afghanistan, the provincial and district governors are able to provide not only offices and accommodation but also contacts with village elders who are an essential part of the enumeration. Activating these valuable resources is likely to be a significant factor in ensuring success.

Census Application of Computer-Assisted Technologies

During the past two decades, there have been rapid developments in NSOs worldwide in the application of computers to statistical work. Indeed, in many countries, NSOs have been in the vanguard of developments in areas such as data capture, geographic information systems and database construction and management. By contrast, in many of the post-conflict censuses, the statistical offices have been left far behind. As already described for both Cambodia and Afghanistan, there were no computing facilities whatever in their statistical offices.

In Cambodia and Vietnam, the adjustment of professional staff to the use of modern equipment and applications occurred very rapidly. It remains to be seen whether this will be the case in Afghanistan. In Vietnam, there was some initial resistance to accepting microcomputers as the basis of census processing, but the attitude soon changed as hardware was introduced, software and systems developed and applications demonstrated. Experience in these countries suggests that the

greater the initial success in persuading the NSO staff of the advantages of technological applications to the census, the more readily a country develops new facilities and promotes needed skills among the staff. Examples demonstrate that, even where there are delays in introducing computing, they need not present too strong a barrier to longer-term development. In Vietnam, for example, advanced work in census mapping, computer-assisted coding and editing, all rapidly followed the introduction of microcomputers for the 1989 census.

In Afghanistan, a demonstration for senior staff illustrated how a commercial software package would allow enumeration-area sketch-map information to be inserted in an automated mapping system. This was instrumental in modifying the views of the NSO on how a modern census should be conducted and the kinds of census products that could be generated. To what extent, in these conditions, new technology can fulfill a significant role in data collection, analysis and dissemination of census results, is still to be determined. The overall approach to the application of technology in a post conflict environment needs to be determined together with a plan for its implementation. A 'needs assessment' is required in order to determine the available skill levels, how these are to be deployed, and how exactly this is to be achieved. Since the Afghanistan Central Statistics Office is starting from a very low base, there is still a considerable way to go in the provision of computer technology, in the training required, and most of all in the establishment of a fit-for-purpose data processing centre.

Use of International Expertise

Ensuring the availability of adequate and appropriate expertise for a modern census is a critical issue but, because of its sensitivity, it must be addressed cautiously. For the 1973 Bangladesh census, for example, two international advisers were recruited. At times both were shunned by the NSO, reducing their potential contribution and increasing the likelihood that the census would not be successful. In Laos, the data-processing adviser was locked out of the office and a similar situation threatened in Vietnam.

In Afghanistan, the NSO has already indicated its concern over the cost and duration of stay of resident advisers. Establishing a good working relationship with appropriate counterparts is essential, although there will always be some reluctance to expose what is perceived as weak-

nesses to an international expert. This attitude can make the offering of advice extremely difficult.

Box 8.3

Acceptability with Independence for International Adviser Credibility

Post-conflict countries are suffering from internal divisions and problems from which international experts need to remain detached while still fulfilling the purpose of their deployment by providing the technical expertise relevant to the programme. It is therefore essential that senior advisers are appointed with the acquiescence of the NSO staff. In Vietnam, a successful network of technical assistance was provided by the UNFPA-supported regional advisory service at ESCAP and the Australian Bureau of Statistics. In Cambodia, apart from international advisers, a large number of United Nations Volunteers were provided by the Philippine's NSO, a strategy that proved very successful.

The Afghanistan CSO will continue to require advice on a range of issues such as capacity building for their data processing and in the adoption of current approaches to their work as a whole. An understanding of that role in the context of reconstruction and redevelopment is also needed and the provision of statistical services to other government departments as part of the method of achieving this. The census is just one part of this process and if successfully completed will serve as a model for other major data collection exercises.

Fieldwork

A special consideration in post-conflict situations is the risk involved in undertaking fieldwork. In Afghanistan, as in Cambodia and other countries undergoing reconstruction, a large number of unexploded landmines remain scattered throughout the countryside. In these circumstances, census fieldwork must be coordinated with mine clearance programmes so that, as a minimum, the main sites of landmines are clearly shown on census field maps. The need to work closely with local, knowledgeable people is also essential in these situations. Again, the offices of the provincial and district governors can be expected to play an important coordinating role.

Dangerous field conditions also emphasise the importance of ensuring the census has wide political acceptance and that, as demonstrated by official committee action and associated publicity campaign, there is the political will to assure unfettered access to all localities. In the pilot phase of the fieldwork in Kunduz, Afghanistan, the local CSO management team did an excellent job of persuading the local radio networks to undertake interviews and broadcast news about the work in the province. The local television station filmed canvassers at work on the doorstep and a radio journalist attended a meeting held between the CSO field teams and people living in a refugee camp.

Where field conditions are likely to be difficult and dangerous, the

Box 8.4

Positive Publicity Promotes Confidence and Supports Advocacy

At the international level, exposure on international news programmes such as CNN or BBC World provides invaluable support for the donor community's confidence in the ability of an organisation to conduct a census. In Afghanistan, the CNN coverage gave not just international exposure but a great fillip to the local staff who began to understand the significance internationally of the work they were about to undertake.

Cambodian model of phased development of the census provides a useful approach - one that has also been applied, in principle, in the Afghanistan situation as noted earlier. The early proposals by UNFPA included provision for a Kabul City survey and a national demographic survey that would lead in turn to the full population census. This approach was rejected for a number of reasons, not the least of which was a consensus on the urgency for commencing the census proper, and the recognition that to concentrate again on a survey of the capital might not be the most appropriate political ploy for revitalising the CSO. The approach adopted instead maintains that element of incremental learning so essential to future success.

Consequently, in Afghanistan, the ***first phase*** is designed to meet specific objectives, namely:

- to provide preliminary counts of population and spatial analysis of population distribution for election planning and reconstruction purposes;
- to provide basic information on the census geography and population size as the bases for preparing automatic processing systems for input and analysis of the main census results;
- to train key staff in the practical implementation and quality control of all census field operations.

The ***second phase*** will include the updating of census maps and household lists produced in the first phase and the conduct and processing of the main census.

If the census in Afghanistan is to be a success, additional work needs to be done during the first phase to expand the capacity of the Afghanistan CSO to a level capable of sustainable operation. A key to attracting the requisite international expertise is by achieving a demonstrable and clearly visible improvement in the performance of managers in senior CSO positions.

Undertaking fieldwork in any post-conflict country presents numerous challenges. Problems are greatly magnified when a country is still far from secure and lacking a supporting infrastructure. In Afghanistan, not only is the land still covered by innumerable mines, but roads are in a desperately poor state of repair, and there is little by way of a transport infrastructure – and certainly none that could be utilised by a census field team. Since there is no nationwide telephone system, communications are a major issue, and in a country with no banking system payments of allowances to field staff and funds for the purchase of fuel and transport become a logistical nightmare.

Security is an issue for all international staff. All missions by road in Afghanistan need prior approval from security officers. Since the specific location of field teams on a daily basis is difficult to predict in detail, this in itself creates an enormous problem and close coordination with local security officers is essential. Field missions that in ordinary circumstances might take only a few days, in Afghanistan are likely to take one or even two weeks – simply to undertake the travel. Missions undertaken by road therefore need to be adequately equipped with food, water supplies and emergency equipment.

Some of the more remote areas may take a week or two to reach by vehicle and then require further travel on horseback. The time and difficulty of undertaking quality fieldwork in these circumstances should not be underestimated.

The Census Budget

In post-conflict situations the transitional or other representative government is commonly on the verge of bankruptcy. In marked contrast to censuses conducted under more normal conditions, almost the entire cost of the census, including the cost of supporting the temporary census establishment and fieldwork, requires funding by international donors. The high cost of census field staff, including transport and materials, accounts for about 70 percent of the total budget, and therefore significantly raises the total cost to donors.

Afghanistan is no exception in this respect and, as implied earlier, transport costs alone absorb considerable resources. The cost of census field staff is a particularly difficult issue. International agencies do not customarily pay the salaries of government employees, yet those employees will often have been paid only nominal amounts in the immediately preceding period due to hostilities and the lack of government funds. In these circumstances it is usual to develop a system of allowances for the payment of field staff consistent with the work they are undertaking and sufficient to provide the necessary incentives to work long hours for the sustained periods, running to weeks or months, that they must spend away from home. This cannot be decided unilaterally and will often involve protracted discussions with the Ministry of Finance, which has a role to play in protecting the position of government employees generally.

Other significant costs occur when, as in Afghanistan, government buildings have no facilities whatsoever and are not suitable for the installation of modern data processing equipment. Costs then incurred may be as basic as providing not only desks and office furniture but also pens, pencils and paper. Rehabilitation of the CSO itself needs to be part of the capacity-building programme. Initially, this needs to be at least to a level of providing adequate data processing capability for the census.

Constant recasting of the census budget is inevitable as new issues need to be addressed. The inclusion of a substantial contingency fund

is obvious and even routine for the technical expert – but its necessity often eludes reluctant finance officers.

Comments

While in a technical sense it may seem dangerous to treat a census in a post-conflict situation any differently from other censuses, there are some important lessons to be drawn from recent experience. The absence of recent census involvement among the staff of CSOs and the lack of computerised processing facilities do not necessarily mean that a good census cannot be conducted. The key is to build into the census plan provisions for the technology and information gaps to be bridged as resources enable improvements to become feasible.

The safety of fieldworkers must also be viewed as of paramount importance, and all measures possible should be in place to ensure it. Where field-work is considered unsafe, a full population census should not be conducted. In any event it is often useful to delay a full census by adopting a phased approach. This strategy provides interim data, allows time to expand national statistical staff capacity and schedules the census proper so that it can be conducted under more stable political and social conditions.

Box 8.5

Political Resolve and Commitment to the Census is Imperative

A strong political resolve to conduct a census is imperative. Often expectations of census output are unrealistically high, reflecting little understanding of the objectives of a census and what it actually involves. Deploying key politicians and respected public figures as advocates for the implementation of the census is likely to help preparations immensely in circumstances of unresponsiveness or lack of cooperation.

The census in Afghanistan is still in its early stages and there is still a great deal to be achieved in a context of factionalism and disruption where peace does not yet prevail throughout the country. Nevertheless, lessons learnt elsewhere have been applied in Afghanistan to good effect with immediate and positive results emerging from the fieldwork in Kunduz. The preparatory work in Afghanistan is also providing a valuable fund of experience and extensive new knowledge that is of benefit both locally and as a useful resource for the future.

NOTES

1. This chapter draws heavily on an earlier paper by Iqbal Alam and Sam Suharto (1998). "Cost Effective Approacher to Population and Housing Censuses," presented at a seminar organized by United Nations Statistics Division in Nadi, Fiji.

2. The expression 'village files' is sometimes given a very different meaning by researchers who use it to refer to civil-status records kept at village level. 'Agricultural censuses' in Africa are commonly not censuses per se but sample surveys of urban-area households as initially numbered and identified by population censuses.

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