

Distr.
RESTRICTED

LC/DEM/R.62
Series A, No. 195
August 1989

ORIGINAL: ENGLISH

**MICROCOMPUTER TECHNOLOGY TO EXTEND THE
USE OF POPULATION DATA IN DEVELOPING
COUNTRIES:**

**Multidisciplinary databases,
geographic information systems and REDATAM**

Session I.16: Use of Microcomputers
IUSSP GENERAL CONFERENCE
20-27 September 1989
New Delhi, India

UN LATIN AMERICAN DEMOGRAPHIC CENTRE (CELADE)
Casilla 91, Santiago, Chile

Table of Contents

1. THE INFORMATION CONTEXT IN LATIN AMERICA AND CARIBBEAN ..	1
2. A STRATEGY FOR INCREASING THE USE OF POPULATION INFORMATION	2
A. A heuristic classification of information users	2
B. Information needs	3
C. The role of microcomputers in the strategy	3
3. TECHNOLOGY FOR IMPLEMENTING THE STRATEGY	4
A. Tailored information for small-areas from population census data: capabilities of the REDATAM system	4
B. REDATAM databases in Latin America and the Caribbean	7
4. FURTHER MICROCOMPUTER TECHNOLOGY REQUIRED	7
A. Present limitations of REDATAM	7
B. Geographic information systems: integrators of data and space	9
C. Specifications for REDATAM-Plus	10
5. BEYOND TECHNOLOGY	11
BIBLIOGRAPHY	13
Summary	14
Résumé	15

1. THE INFORMATION CONTEXT IN LATIN AMERICA AND CARIBBEAN

Demographers and others directly involved with population regularly stress the importance of integrating population information in policy making and development planning. This imperative, usually seen from the viewpoint of those working in the population field, tends to be oriented to the formulation and implementation of policies and plans intended to ameliorate demographic trends. Nevertheless, it is felt that available knowledge is not widely used for such purposes in many developing countries (cf., for example, Urzúa, 1985 and other papers presented in the session on the Utilization of Demographic Knowledge in Policy Formulation and Planning at the 1985 IUSSP General Conference). In this paper, however, a different, but not exclusive, approach will be taken to the integration of population in development: population information will be considered primarily from the point of view of public and private sector fields not necessarily directly concerned with population, per se, yet which use population data with other information in their work. The major concern will be with the use of microcomputers, to facilitate (and, perhaps, thereby increase) the utilization of population information in these fields for their own purposes, concentrating primarily on the developing countries of Latin America and the Caribbean.

Efforts to increase the use of population information in development in the Latin American and Caribbean region must be seen within the presently prevailing conditions in which the economic debt crisis and associated social and political crises of the 1980's have contributed to the sensation (and frequently, the reality) that national level planning often is only a "book plan" and that much of planning and project implementation should be decentralized to municipal or other sub-national authorities. Furthermore, in many countries there is a weakening reliance on the state as the primary force for development and an increasing importance given to assisting private sector initiatives. In some of the countries, the decentralization is also part of an attempt to increase local participation to

create more democratic societies that will be willing to share both the difficulties of the adjustments to overcome the crisis and the benefits of the hoped for future growth.

In these circumstances, decentralizing population and associated information should be facilitated so that sectoral ministries, local authorities (e.g., municipal agencies) and the private sector have access to the population information collected by the national statistical office and other national bodies.

2. A STRATEGY FOR INCREASING THE USE OF POPULATION INFORMATION

A. A heuristic classification of information users

Microcomputer technology can play an important role in a strategy directed toward increasing the access that the public and private sectors at national and subnational levels have to population data and knowledge that they may need within their own fields of endeavour. This "supply-oriented" or "demographics" approach is common in the developed countries, but is almost unknown in the Latin American and Caribbean region. The approach aims to meet **existing**, but poorly satisfied, needs of the three general classes of professionals who use population information: 1) primary, 2) related, e.g., family planning workers, and 3) ancillary users of population data and knowledge.

The primary and related users work directly in population or in closely allied fields, are relatively few in number in most of the countries and tend to be concentrated in the capital and larger cities. The ancillary users, on the other hand, work in a wide variety of fields, do not have a special interest in population, *per se*, but often require demographic data for their own purposes such as transport planning, agricultural planning, hospital location, zoning, commercial development, market analysis, etc. These ancillary users are numerous and geographically dispersed. The problem of interest here, which is congruent with the changing development focuses in the Latin American and Caribbean region, is how to make population data more readily available to these as well as to more primary users.

B. Information needs

As most ancillary users within a country are likely to be concerned with specific regions or local areas where a given project is to be developed, they, and demographers and others confronted with similar situations, normally require that the population information that they receive have certain characteristics, in particular that it be:

- Specific to the particular **geographical subnational area(s)** of interest;
- Tailored** to meet the user's individual needs within the geographical area(s) of interest, including disaggregation by socio-economic or other categories;
- Associated with other socio-economic data describing the area(s), i.e., **multidisciplinary**.
- Representative of the time **period** of interest.

While the census (and often other officially collected data) should be a major source of such information, in the Latin American and Caribbean countries this has seldom been so in the past, due to the technical and political difficulties and/or the cost of obtaining the highly disaggregated information for specific small areas, the delays in the census data dissemination in most countries and the lack of association of the data with other information. In addition, for most users there are difficulties in analyzing the spatially-oriented data and presenting the results to decision makers.

As most of the countries of the region will be carrying out population and housing censuses during the early 1990's, there is a major opportunity to ease the use of census data while it is still 'fresh', by ancillary and other users through the introduction of suitable technology to facilitate the retrieval and utilization of the census data.

C. The role of microcomputers in the strategy

The large number and geographical dispersion of the actual and ancillary users makes the use of microcomputers a key element in the strategy. Software must be available for these to retrieve, manipulate and elaborate the data for the specific small areas of interest

from the population census and from sources of other fields. In addition, as population data becomes easier to obtain and process, there will be an increasing need to include it in spatially-oriented models, and to analyze and visualize the data spatially in cartographic displays. Since many of the users will be from substantive fields and, particularly at the sub-national level, will use population information only occasionally, the microcomputer software not only must be 'user-friendly' in the traditional sense, but must be able to be operated with a minimum of outside assistance and with features that facilitate recall. While the remainder of the paper will concentrate on these and related technological aspects of the strategy, it is important to keep in mind that these are necessary but not sufficient conditions for improving and extending the use of the information.

3. TECHNOLOGY FOR IMPLEMENTING THE STRATEGY

This section will describe the work being done by CELADE to develop and adapt microcomputer software that meet some of the requirements of users (see page 3) within the framework of the strategy outlined above.

A. Tailored information for small-areas from population census data: capabilities of the REDATAM system.

The REDATAM ^{1/} software, written by CELADE in the C-language, is a user-friendly interactive system designed to make it easy for population information users to obtain small area information rapidly and at low cost from large hierarchically structured (if desired) population and housing census datasets or other similarly patterned data. REDATAM stores compressed microdata of an entire population and housing census that may involve

^{1/} REDATAM = REtrieval of DATa for small Areas by Microcomputer.
REDATAM = REcuperación de DATos para Areas pequeñas por Microcomputador.

The REDATAM software was developed with a grant from the International Development Research Centre (IDRC) of Canada, with additional assistance from the United Nations Population Fund (UNFPA) and the Canadian International Development Agency (CIDA).

millions of records and hundreds of megabytes of data, or of a region or large city, on an ordinary IBM XT, AT, PS/2 or compatible microcomputer ^{2/} and produces tabulations, usually within minutes, for any variables for any small geographical area(s) specified by the user down to city blocks or grouping of such areas. The user interface and the documentation are available in English and Spanish (CELADE, 1987b, 1987c and 1988).

The general specifications for REDATAM were presented at the 1985 IUSSP General Conference (Conning, 1985) as the programming of the initial version of the system was beginning. The present version, REDATAM 3.1, was released for general use around mid-1988.

REDATAM differs from most statistical processing packages in that it permits a user to define rapidly and interactively any ad-hoc geographical area of interest contained within a larger area of a hierarchically structured database so that the output processing can be limited to geographically selected sub-set of the entire dataset which may have many millions of records. Normally the database will have all the original census or survey variables, each with all the digits of the original codes. such as full-digit occupational and industrial codes.

OUTPUTS: REDATAM 3.1 has the following outputs which can be sent to the screen, a printer or a file for any geographical areas defined by the user from whole cities or regions down to the smallest unit defined in the data (or permitted by the REDATAM database administrator):

- Cross-tabulations with up to four variables;
- Averages with up to four classification variables;
- Marginal frequencies;
- Export of the data within the user-defined area as a DOS flat file or with complete dictionary parameters for direct input into SPSS-PC or SL-MICRO for producing more sophisticated statistical outputs than available in REDATAM itself;
- Export of a self-contained REDATAM sub-database for the user-defined area, permitting its use on another smaller machine or for decentralization of information to sub-regional or municipal offices.

^{2/} The database be may stored on a hard disk (each 1 million records of a 'normal' census occupy around 20 Mb), on a 'Write Once Read Many' times (WORM) laser disk or on a CD-ROM. These storage media are transparent to the end-user.

For any of these outputs:

- The results can be obtained for sub-areas within the user-defined area, as well as for the entire user-defined area;
- Cases can be weighted;
- Variables can be recoded and new variables can be derived;
- Output for the geographical area can be further restricted to a subset of the population within the area;
- Hierarchical processing can be performed, that is, within a household, persons can be selected or new household variables derived for subsequent tabulation, such as the number of males attending secondary school by household income category and by household car ownership;
- The processes, and geographical area definitions, can be saved for later use or edited to introduce changes;
- Computed variables can be treated as integers for processing speed but can be decimals (floating point) when required;
- The number of cases can be limited to the first n cases in the area or may be a sample of the cases;
- The database can be protected by passwords;
- The processes can be executed on-line or, alternatively, in batch to permit processing whole countries or large regions by microcomputer without the user being present.

Extensive help is available at all times to assist new or occasional users who do normally will not require programming assistance. There are also a variety of management features to facilitate the construction and editing of REDATAM databases and the addition of new variables or areas to existing databases.

INPUTS REQUIRED: The population and housing census (or similarly structured data of interest) must be converted into a REDATAM database, usually with the data compressed to around one-third to one-fourth its original size. While substantive users will normally be able to obtain results from an existing database without outside assistance, a programmer will probably be required to generate a large census database. The one-time creation of a database requires: a very clean set of microdata (if necessary, transmitted from a mainframe to a microcomputer), codebook information on each variable and its categories, and the geographical hierarchy and associated names. Actual use of the database may require maps to identify the geographic subdivisions of interest to the user

(the database administrator use passwords to limit access to the lower levels coded in the census if such access is not permitted by the national authorities for reasons of confidentiality).

The REDATAM software package comes with a demonstration hierarchical population and housing database of around 7000 persons for a hypothetical country, Miranda, which is used in all examples and in the tutorial.

B. REDATAM databases in Latin America and the Caribbean

The national statistical offices of many countries of the region have REDATAM databases of their 1980-round censuses and others have expressed their intention to do so. Beyond the immediate use of the data, the experience in each country with small-area census data retrieval is extremely important in the overall strategy presented in this paper, since the experience may affect how the 1990 censuses are planned and conducted, which in turn will affect their usefulness for small area purposes (see, for example, CELADE, 1987a; Silva and Conning, 1988). Table 1 lists the countries of the region with known REDATAM census (or other) databases and provides information on the numbers of records involved and the megabytes of storage required for the database. It will be seen in Table 1 that REDATAM has also been employed for survey and other data processing, primarily to take advantage of its processing speed ^{3/} and ease of use.

4. FURTHER MICROCOMPUTER TECHNOLOGY REQUIRED

A. Present limitations of REDATAM

In terms of the strategy outlined above to increase the use of population information and particularly census data, REDATAM 3.1 satisfies the first of the user needs (see page 3) since it provides a rapid and low-cost way of making it possible to use a

^{3/} While benchmark studies of REDATAM processing speed have not been made, the following example is indicative. On an IBM AT microcomputer recoding and tabulation of age by sex by international migration status of the 1982 census of Chile (using a laser disk) took 52 seconds for an area with 10,000 population, 18.5 minutes for 232,000 cases and 5.5 hours for all 4.3 million persons living in the city of Santiago.

Table I: Latin American and Caribbean REDATAM databases (where known)

Country/ area	Data source	HHolds (000)	Persons (000)	REDATAM (Mb)	Comments
Latin American countries					
Argentina/Viedma	Pilot census for '90	18	56	2.5	
Brazil/Limeira	Pilot census for '90	45	184	2.7	Basic questionnaire
" "	Pilot census for '90	4.5	18.4	1.8	Sample: enlarged questionnaire
Bolivia	1976 census (sample)	39	155	3.5	Census sample
Chile	1982 census	4,000	12,000	300	Stored on 3 WORM laser disks
Colombia	1985 census	5,800	27,800	70	Basic questionnaire
"	1985 census	600	2,800	60	(each region has own database)
Costa Rica	1984 census	500	2,500	60	
"	Vital statistics	-	80	1.5	Births and deaths databases
"	Household survey 1986	5	25	1	
Cuba	Fertility survey	?	?	?	
Dominican Republic	Fertility survey	8	20	0.5	(8=women; 20=children)
	1981 census(10% sample)	125	600	20	
Mexico	Pilot census for '90	?	?	?	
Nicaragua	Demographic survey	21	129	8	
Uruguay	1985 census sample	147	438	15	(full database to be generated)
English-speaking Caribbean countries					
Belize	Demographic survey	1	5	0.5	
	1980 census	28	145	4	
Dominica	1981 census	17	79	2.5	
Guyana	Demographic survey	8	42	1	
Jamaica/Hanover parish	1982 census	15	64	2.3	(full database to be generated)
Trinidad & Tobago	1980 census	234	1055	45	(database undergoing corrections)

microcomputer for retrieving and processing small-area census and other data. However, the system has major limitations with respect to the other user-needs specified, since it does not directly facilitate the analysis and spatial display of the data, nor the utilization of multidisciplinary information in association with the population data nor the projection of the population-related data to the period of interest. Another major weakness is that it can handle only two hierarchical levels of microdata, dwellings and population or their equivalents, so it cannot have, for example, births of women of dwellings.

Overcoming some of these limitations, is the purpose of the work presently underway on REDATAM-Plus. Before describing the major features of REDATAM-Plus, the potential importance of geographic information systems for the strategy will be briefly described.

B. Geographic information systems: integrators of data and space

As the data required for social, economic and infrastructure development at sub-national levels are normally spatially-related, geography can serve as the integrating dimension, i.e., the units described can be areas in the geographical hierarchy of the census: provinces, municipios, blocks, etc. Powerful geographic information systems (GIS) have been developed to digitize and manipulate cartographic information in association with multidisciplinary attributes describing geographical points, lines and areas (polygons) and there are various generalized microcomputer GIS available (PC-ARC/INFO, PAMAP, SALADIN, CMAPS, PC-MAP, etc). In principle, individual regions, cities, and local authorities in developing countries now have a relatively low-cost technology for analyzing and spatially displaying their social, economic, environmental, etc., data, including population, for public and private sector use (examples of GIS applications in many different fields are given in Ripple, 1987). In fact, a number of institutions in various Latin American and Caribbean countries have already obtained GIS systems and are starting to create the necessary cartographic base files of their territory or of specific areas of interest.

Given the fact that microcomputer-based GIS systems are beginning to become available in many countries of the region, the strategy of increasing access to population

data as a means of furthering the integration of population factors in development could be advanced by making population census data that can be tailored to ad hoc specific needs, easily available for use with the GIS (conditions which imply some degree of interaction between the user, the data and the GIS, rather than a fixed set of pre-configured information).

C. Specifications for REDATAM-Plus

Taking into consideration the importance of making population census data available for use with GIS, as well as taking into account the other criteria set out in section 2.B, the following major features are being added to a completely re-written version of REDATAM to be known as REDATAM-Plus ^{4/}:

1. A user-friendly interface with at least one high-end and one low-end geographic information system for mapped displays and, for more sophisticated users, spatial analysis and modelling with population data;
2. A multidisciplinary geographically structured database with various hierarchical levels of microdata and in which there are aggregate data variables for the geographical areas (generated from microdata in the REDATAM-Plus database or imported from other sources); appropriate commands to permit hierarchical processing of the information in the database;
3. Network operation to permit multiple use of a database;
4. User specified publication quality table formatting, if desired.

REDATAM-Plus will interface initially with the GIS microcomputer systems: pc-ARC/INFO, a powerful, relatively expensive vector-based GIS marketed by Environmental Systems Research Institute (ESRI, 1988); and MAP-for-the-PC, a low-end, inexpensive, raster-based (pixel) GIS, written at various U.S. universities primarily for teaching purposes

^{4/} The work has been made possible through an additional grant from IDRC and further support from UNFPA and CIDA.

(Ohio State University, 1987). Interfaces may be created with other GIS if they can be obtained at reasonable cost by CELADE.

Since many users initially will not have access to GIS systems (or will not have the cartographic base files required), REDATAM-Plus is also being rewritten to operate with its own multidisciplinary database. In simplified terms, there will be a hierarchy from the highest geographical level down to the lowest level of microdata and at each level it will be possible to store variables describing one or more of the 'geographic' areas. A user will be able to aggregate housing, population, etc., microdata upwards to any higher level and to store the new variable(s) at that level. Thus, for example, information on persons or houses within a city can be aggregated to describe the level of poverty in each city block, and the resulting variables stored for further use. Alternatively, this approach permits multidisciplinary data for each block (or other geographic level) from other sources to be imported into the REDATAM-Plus database, such as the existence of a family planning clinic, the average value of the housing, soil type, etc. While the manipulation of the data by REDATAM-Plus will not have the spatial analysis facilities of a GIS, REDATAM-Plus will be able to work efficiently and conveniently with the original population census microdata in conjunction with the rest of its database.

After being tested in a Latin American and a Caribbean country, respectively, REDATAM-Plus will be released for general use in early 1990. A concentrated effort will then be made to have the national statistical offices of the region create REDATAM-Plus databases with their freshly collected 1990 census data so that they will be in a position to provide small-area data services to users in the public and private sectors.

5. BEYOND TECHNOLOGY

Microcomputer technology plays an important role in the strategy outlined above to increase the use of demographic information, especially by professionals who need to use population information in their own fields. But technology is at best a necessary condition.

It also must be made known and available to potential users and eventually the technology, itself, must help persons from other fields to use population information properly ^{5/}.

But equally important, is the availability of the population data, itself, to these users, who as postulated above are expected to be geographically distributed and from many different fields. REDATAM (and perhaps other systems) is specifically designed to facilitate decentralization of the census data (such as by downloading REDATAM sub-databases to local authorities or through the use of CD-ROM in large countries), but this means that the national statistical offices in the developing countries must be willing to release the data at reasonable prices to national and sub-national users in the public and private sectors, taking the necessary precautions for protecting confidentiality as required. Unfortunately, in the developing countries it is not always clear that the national statistical offices feel that they will be strengthened by a strong demand for their information. But without a commitment to public information services and decentralization by the authorities holding the information, even the most user-friendly microcomputer systems will remain only demonstration samples.

^{5/} Naturally, the emphasis in this paper has been on the information aspects, per se, of the use of population data, ignoring substantive issues concerning problems of collection, data quality, and interpretation.

BIBLIOGRAPHY

- CELADE (1987a), The Relevance of the REDATAM system for the 1990 censuses. [also in a Spanish version]. CELADE, Santiago. Series A-174. LC/DEM/R.48
- (1987b), **REDATAM Version 2.00 User's Manual**. CELADE, Santiago. (June 1987) Series A-0173. LC/DEM/G.50 [also in a Spanish version].
- (1987c), **REDATAM Database Generation Manual** (English and Spanish versions). CELADE, Santiago (October 1987). Series A-0178, LC/DEM/G.53. [also in Spanish].
- CELADE (1988), **Supplementary Manual for REDATAM Version 3.1: Supplement to the User's Manual and the Database Generation Manual**. CELADE, Santiago. (May 1988) Series A-181. LC/DEM/G.50/Add.1. [also in a Spanish version].
- ESRI (1988), **ARC/INFO Technical Handouts**. ESRI, Redlands, California.
- IUSSP (1985), **Proceedings of the IUSSP International Population Conference, Florence, 1985**
- Ohio State University (1987), **The MAP Analysis Package: MAP-FOR-THE-PC**. Geographic Information Systems Laboratory, Department of Geography, Ohio State University, Columbus, Ohio.
- Ripple, William J., ed. (1987), **Geographic Information Systems for Resource Management: a Compendium**. American Society for Photogrammetry and Remote Sensing and the American Congress on Surveying and Mapping. Falls Church, Virginia. ISBN 0-937294-89-6.
- Silva, Ari and Conning, Arthur (1988), El rol de la cartografía en la utilización de los datos censales de 1990 con los sistemas de información Geográfica conectados a REDATAM-Plus [The role of cartography in the utilization of the 1990 census data with Geographic Information Systems and REDATAM-Plus]. Document presented in the Census Cartography Seminar, San José, Costa Rica, 1988. CELADE, Santiago. Series A-189.
- Urzúa, R. (1985), Overview: 'Utilization of demographic knowledge in policy formulation and planning' in **Proceedings of the IUSSP International Population Conference, Florence, 1985**, vol. 3, pp. 315-17.

Summary

As part of a strategy to help increase the integration of population in development planning and project implementation, with particular reference to Latin America and Caribbean (LAC), microcomputer technology can be used to greatly increase the access that the public and private sectors at national and subnational levels have to population data and knowledge. This "supply-oriented" or "demographics" approach aims to meet **existing**, but poorly satisfied, needs of the three general classes of population information users: primary, related and ancillary users. The former two categories work in the population field, are relatively few in number and tend to be concentrated in the capital and larger cities. The ancillary users, on the other hand, are much more numerous but are more dispersed and work in a wide variety of fields. As most ancillary users within a country are likely to be concerned with specific projects, they normally require that the population data be specific to particular geographical subnational areas, disaggregated and tailored to meet their needs within the geographical areas of interest, multidisciplinary and representative of the time of interest.

While the population census (and other data sources covering entire countries) should be a major source of such information, in the LAC countries this has seldom been so in the past. Version 3.1 of REDATAM (REtrieval of DATa for small Areas by Microcomputer) developed by CELADE provides a rapid and low-cost means of providing small-area tables of any variables for any areas of interest from the **microdata** of an entire census (or survey) without programmer assistance.

The new version, REDATAM-Plus, which is oriented towards maximizing the usefulness of the 1990 censuses, will be released around the beginning of 1990. It will enable users to take advantage of geographic information systems (GIS) for display and analysis and will have multidisciplinary capacities.

While microcomputer technology can facilitate the use of population information in the developing countries, it requires that the national statistical offices make available their census and other data to the public and private sectors. This will come about when the statistical offices recognize that they gain strength from having their information widely used.

Résumé

TECHNOLOGIE DES MICROORDINATEURS POUR L'EXTENSION DE L'UTILISATION DES DONNEES DE POPULATION:

Bases de données multidisciplinaires, SIG et REDATAM

Comme partie d'une stratégie destinée à favoriser l'intégration de la population dans la planification du développement et la réalisation de projets, avec référence particulière à l'Amérique Latine et aux Caraïbes (LAC), la technologie des microordinateurs peut être utilisée pour augmenter énormément l'accès des secteurs publique et privé aux niveaux national et sub-national aux données et à la connaissance de la population. Cette approche "orientée à l'approvisionnement" ou "démographique" essaie de répondre aux besoins existants mais peu satisfaits des trois classes générales d'utilisateurs d'information sur la population: les utilisateurs primaires, connexes et ancillaires. Les deux premières catégories travaillent dans le domaine de la population, sont relativement peu nombreux et ont une tendance à être concentrées dans la capitale et les grandes villes. Les utilisateurs ancillaires, par contre, sont beaucoup plus nombreux mais aussi plus dispersés, et travaillent dans une grande variété de domaines. Etant donné que la plupart des utilisateurs ancillaires d'un pays s'occuperont probablement de projets spécifiques, ils ont normalement besoin de données de population qui se réfèrent à des aires sub-nationales géographiques spécifiques, désagrégées et "taillées" pour répondre à leurs besoins à l'intérieur des aires géographiques d'intérêt, multidisciplinaires et représentatives du moment d'intérêt.

Bien que le recensement de la population (et d'autres sources d'information que recouvrent des pays entiers) doive être une source majeure de ce type d'information, dans les pays du LAC ce n'a pas souvent été le cas dans le passé. La Version 3.1 de REDATAM (Récupération de données de petites aires par microordinateur), développée par le CELADE, offre un moyen rapide et peu coûteux de fournir des tableaux pour des petites aires, pour n'importe quelle variable et pour toutes les aires d'intérêt à partir des microdonnées d'un recensement (ou d'une enquête) entier, sans l'aide d'un programmeur.

La nouvelle version, REDATAM-Plus, destinée à maximiser l'utilité des recensements de 1990, sera disponible vers le début de 1990. Elle permettra aux utilisateurs de profiter des systèmes d'information géographique (SIG) pour la présentation et l'analyse de l'information, et aura des capacités multi-disciplinaires.

Bien que la technologie des microordinateurs puisse faciliter l'exploitation d'information sur la population dans les pays en voie de développement, la disponibilité de données censales et d'autres sources aux secteurs publique et privé dépendra, finalement, de l'acceptation par les bureaux nationaux de statistique qu'ils ne peuvent que bénéficier d'une utilisation plus répandue de leur information.