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Census of population and housing of Morocco: From decennial census to continuous census

by

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The views expressed are those of the author, and do not necessarily reflect those of the HCP.

Abstract

Morocco's triple demographic, economic and politic transition calls for up-to-date data at the finest geographical levels (e.g. communes, rural areas, neighborhoods). Census of Population and Housing, carried out every 10 years, is the most comprehensive source of demographic and socioeconomic data on the population of Morocco, at the local level. Since the last 2004 census, poverty and unemployment rates have declined by 5.2 and 1 point at the national level, respectively (HCP, 2008a). However, data at the commune level will not be available -under the current scheme- before 2014. Countries such as France and the USA have developed revolutionary census designs to increase timeliness of results, to improve coverage and to spread ever increasing costs of undertaking censuses. Through the review of these experiences as well as the practices of sampling at the National Statistics Office of Morocco, this paper proposes methods of conducting a rolling census of Morocco.

1. Introduction

At the age of information, fresh statistical data pertaining to small geographical units are critical to all actors in civic society. Census of population and housing, conducted each decade in Morocco, is the only source of demographic and socioeconomic data at the local level (i.e., communes). Recent technological advances, such as intelligent character recognition and geographic information system, as well as the maturity of the practice of rolling sampling, have encouraged some countries (e.g. USA, France) to renovate their censuses. The objectives are to increase timeliness of results, to improve coverage and to spread ever increasing costs of undertaking censuses.

This study proposes different continuous census scenarios. The proposed plans are to produce annual results at the finest geographical levels. This article is organized as follow. After the introduction, United Nations recommendations regarding censuses and brief overview of traditional census of population and housing of Morocco are presented. Then, theory of continuous/cumulating samples and case studies of rolling census of France and the American Community Survey are illustrated. Followed by an overview of practices of sampling at the national statistics office of Morocco and proposed scenarios of continuous census of population and housing. Finally, advantages and limitations of both alternatives are argued.

2. United Nations recommendations

The United Nations recommends that all countries or regions of the world produce detailed statistics of the population and housing at small geographical levels, at least once between 2005 and 2014 (United Nations, 2007).

Census of population and housing is the total process of collecting, compiling, grouping, evaluating, analyzing and publishing/disseminating demographic, economic and social data, pertaining, at specified time, to all persons and living quarters of a

country or a well-delimited part of a country (United Nations, 1997).

The four essential features of census of population and housing are individual enumeration, universality within defined territory, simultaneity and defined periodicity. The second revision of the United Nations report, entitled « Principles and Recommendations for Population and Housing Censuses » stated that individual enumeration feature can be met by, other then field data collection, through the use of administrative registers. In addition, universality feature does not preclude the use of adequate sampling methods to estimate population characteristics (United Nations, 2007).

3. Census of Population and Housing of Morocco
Census of population and housing of Morocco is in harmony with international standards. Five censuses were undertaken in 1960, 1971, 1982, 1994 and 2004, respectively. Except the latter, all censuses were subject to sampling at the processing of questionnaires phase. Census 2004 was the only, where all collected questionnaires were exhaustively processed.

The High Commission for Planning integrated with success technology of Intelligent Character Recognition (ICR). Scanning of questionnaires and ICR allowed for producing results in timely manner (Marseli, 2005). This human and capital investment could be continuously used in the case of a rolling census.

4. Continuing/rolling sample
Cumulated/combined sampling allows a single survey to answer multiple objectives. Cumulated and combined sampling means the aggregation of samples in time and in space, respectively. This concept was developed by Kish and published in a series of articles from 1979 to 1999.

Rolling sample is based on principle of selecting k exclusive samples. Each sample represents 1/f of total population and is collected on a period, until all samples are collected in k periods. If k=f, then we have a rolling census (Leslie Kish, 1999).

5. Rolling census of France
Since 2004, the National Institute of Statistics and Economic Studies (INSEE) has implemented a new methodology of census of population and housing. Renovating the census of population and housing was inspired by the will to improve rendered service to the public. A census conducted in average each 5 years, no longer responded adequately to users expectations (INSEE, 2005). Traditional census methods attained their limits: on one hand, it has become increasingly difficult to reach households of larger cities. On the other hand, necessary credits in a short period of time increased. Sampling could be the adequate solution to these issues. Implementing a census of population and housings that relies on cumulated/combined

sampling have some prerequisites: An up-to-date sampling frame, a comprehensive sampling plan, reliable auxiliary information (e.g., taxation information) and multiple tests.

Sampling frame: *Répertoire d'Immeubles Localisés* (RIL) constitutes a list of buildings, identified and localized in a Geographic Information System. The RIL was started in 1999 census and updated using administrative and postal files.

Sampling plan: France account for 36650 communes. 35750 of which have a population less than 10000 and represent about half of the population of France. Communes with less than 10000 inhabitants are enumerated exhaustively once every five years. Every year, one fifth of communes are enumerated. Each fifth is weighted using demographic and housing criteria, to be representative of the 26 regions of France. Communes of more then 10000 habitants are visited each year. But, only a fraction of their population is enumerated (8% of building per year). Within 5 years, 40% of the population of these communes is enumerated. In all, 70% of total population of France is enumerated, during a cycle of 5 years. The process slides from one year to the next.

Sampling unit is an address. All households of selected addresses are enumerated. There are three types of addresses: Addresses with large number of housing units, new addresses and others:

a. Some addresses are larger than others, with regards to number of housing units. In order to avoid cluster effect, large addresses (at least 60 housing units) are enumerated exhaustively within 5 years. But, no more than 10% of housing units - of large addresses - within a commune is surveyed. These addresses are distributed in five yearly groups, using cube method (Deville, 2004).

b. New addresses are exhaustively enumerated as well, within five years at the start of the operation (for the fist time) and within three years thereafter.

c. Other addresses are divided into five annual groups and weighted in the same manner as communes of less than 10000 habitants (i.e., cube method). Each year, a random sample of addresses is drawn from the group of the year. In order to guaranty representation of the underlying group of addresses, sampling rate is at least 2%.

Results: The new approach allows a yearly dissemination of detailed statistics at fine geographical levels (e.g., neighborhood). For the national and regional levels, the fact that rotational groups of communes of less than 10000 inhabitants are weighted at the regional level and the rotational groups of addresses of the remaining communes are weighted at the commune level, allow to produce, with only yearly collected data,

statistically significant results at the national and regional levels.

Concerning other geographic levels (e.g. commune), data collected within five years are combined to elaborate valid results for the median year of the underlying period. This process slides from one year to the next. Bring data reference technique, to the median year, differs according to type of enumerated communes, in term of size of population:

a- For communes exhaustively enumerated (less than 10000 habitants). Data collected on the median year are used as it is. Data collected in the other years of the five-year cycle, is either interpolated using the last published results or extrapolated using housing tax information.

b- Concerning communes subject to sampling of addresses (10000 habitants of more). Data is first extrapolated (extrapolation factor about 2.5) to represent total population. Second, data is actualized to the reference year. This is done by multiplying the average number of people per housing unit (during the five-year period) with the number of housing units on the median year (from RLI).

Prior tests to implementation: a 3 year-period test in several communes was done concerning several aspects: Sampling, questionnaire, data collection processes, computer program and organizational issues.

5- American Community Survey
The American Community Survey (ACS) is a new continuous survey, conducted by the US Census Bureau. It replaces the long form decennial questionnaire. Indeed, US decennial census used to have a short form - collected for every household- and a long form collected for one sixth of households. This approach, of two-questionnaires, collected simultaneously is no longer used. Motivations behind this change are to reduce periodicity, control cost and improve the implementation of the new decennial census.

US Census Bureau has studied many alternatives to traditional census: large survey on the middle of the decade, combination of modeling and surveys, and continuous surveys. The choice was in favor of development of continuous survey (i.e., ACS). Decennial census, required by the constitution is limited to the short questionnaire.

Since 2004, a sample of about 15000000 households is collected, uniformly, in a period of five years (3000000 households each year). The sample represents 10% of households. ACS is a postal survey with follow up of non-responses by phone and for a sub sample (one third) by personal interview (U.S. Department of Commerce. 2006). Sample is drawn from an up-to-date sampling frame.

Sampling frame is a list of addresses of the whole nation. Indeed, a Master Address File (MAF) was constructed since 1990 and updated using postal addresses. Field verifications are carried out by communities. MAF is integrated with a geographic information system called TIGER (Topologically Integrated Geographic Encoding and Referencing database).

Sampling plan: sample of ACS is drawn from all the 3141 communities of the USA. Total size of sample is 15000000 households, which is about 10% of households, collected in a period o f 5 year. The annual sample is 3000000 households. Addresses of households of the MAF are randomly divided into 5 sub sampling frames. Addresses are drawn from sub sampling frame for the current year. At the end of the 5 year-cycle, sub sample frames are re-used in the same previous order.

There are different sampling rates, in order to produce estimators with the same confidence intervals in different geographic areas. Hence, blocks of housing units are separated into five categories with different yearly sampling rates (between 1.7% and 10% on 2005). Assigning blocks to a specific category depends on the size of the geographic entity (i.e., communities, census tracts) with the number of occupied housing units. The latter is estimated from the MAF. Households within each category are uniformly distributed, for all five sub sampling frames.

Results of the ACS are produced and published every year for all geographical levels. For small geographical areas (population of less then 20000), data is cumulated over a period of 5 years. Results cumulated over a three-year period represents areas with a population between 20000 and 65000. Finally, areas with population over 65000 are represented by data collected within one year.

6- Virtual census is implemented in some countries that have reliable administrative registers systems. Personal code is used as a key to get information from different sources at the individual level. This approach reduces the associated cost with data collection and citizen burden to respond to questionnaires. Information is available all the time. Implementing such system requires a huge initial investment, data relevance and harmonization of concepts and definitions through different sources.

7- Sampling practices at the National Statistics Office (NSO) of Morocco
In this chapter, we shed some light at the practices of sampling at the NSO of Morocco. In particular: Master Sample, sampling techniques of the national survey on household living conditions of 2006-2007, the national survey of labor, the national demographic survey, with repeated passages of 1986-1988 and the survey of renting.

Master sample: Conducting household surveys is based on probability sampling from

sound sampling frame of sampling units. The NSO does not have a sampling frame of household addresses. Within the framework of the national household survey capability program, initiated by the United Nations (United Nations, 1986), the NSO started developing a master sample. After Census of population and housing 1982, the NSO implemented a national household survey program that relies on master sample. Since, three sample frames have been developed, at the occasion of each decennial census, 1982, 1994, 2004 (HCP, 2006a).

Master sample is a sub sampling frame, representative of the initial sampling frame. It is made of a set of Primary Units (PU). Each PU is a geographic area (easily identified on the field), with an average size of 600 households. In 2004, the whole national territory was divided to 9093 PU, 557 of which in urban area. Master sample of 2004 is composed of 1848 PU, 1124 of which in urban area. The sampling of PU is done in a probabilistic manner. First, implicit stratification by region, province and urban communes in large cities is made. In urban area, further stratification by housing types is done. Selection of PU is systematic with probability proportional to size with households. In rural area, PU are sampled using systematic sampling, from cumulated total sizes of communes with households. Each PU is composed of 12 Secondary Units (SU). Each SU is composed of 50 households on average.

National survey of household living conditions of 2006-2007: Stratified sampling with three stages is done (HCP, 2006b). 600 PU are sampled from the master sample. Then, one SU per PU is selected. After listing on the field all households within the SU, 12 households per SU are selected according to systematic sampling with equal probabilities. Sample size is 7200 households.

National labor survey sampling plan is the only that uses cumulating concept. But, it is also overlapping sample: 50% of sample remains for the next year. The NLS is a three-stage cluster sampling with an annual renewal rate of 50% (HCP, 2008). All PU of Master sample are used in the sampling plan. One half of PU are assigned an even number. The other half of PU are assigned an odd number. 6 SU are sampled, with equal probabilities, from each PU. 12 sub samples of selected SU are constructed, such as: Each sub samples of SU is composed of SU from even or odd PU and only one SU per PU. Then, two sub samples (even and odd) of SU are used every year, one of which for the first time. Each sub sample is used twice at most within a two-year cycle. All households are listed for selected SU. Using systematic sampling, 35 and 30 households are selected in urban and rural areas, respectively. Sample size is 61060 households, 39340 of which in urban area.

National demographic survey, with repeated passages of 1986-1988**:** Sample plan is self weighted cluster sampling. Secondary Units (SU) are exemplary clusters with adequate size. Since SU varied in numbers and size within Primary Units (PU),

selection of PU is made with variable probabilities. Such probabilities, guaranty that the global probability of sampling is equal to sampling fraction, which is about 1/120. 424 clusters/SU are selected and exhaustively surveyed, which is 30000 households (Zerrou, 1989).

Renting survey: sampling plan of this survey is not aerial sampling of PU/SU. It is different because it uses list of households from census of population and housing (HCP, 2007). Indeed, once a sample of households was drawn, according to systematic sampling stratified by housing types, addresses of households are identified using database of questionnaires images. This method, a first experience, was made possible because of the readily available scanned questionnaires. However, localization rate of these addresses by surveyors in the field was not high. This is due in part to the non exactitude/completion of addresses on questionnaires.

8- Continuous census of population and housing of Morocco
Bibliographic research on different methods of continuous sampling practiced by various international statistical systems showed that there is no portable model for all countries. In fact, these are *adhoc* methods developed and implemented given the available pre-requisites and objectives to attain.

This study proposes two scenarios to conduct a continuous census of population and housing. These methods share the objectives of producing detailed yearly data representative of all geographic levels. Data collected within a one-year period are representative of national and regional geographic levels. While, data collected during five years period are representative of provincial and communal geographic levels. The process is carried out from one year to the next using moving averages. The basic different between these two scenarios is the used sampling frame. The first sampling frame is aerial, while the second is a list of households.

Aerial sampling of PU: Since 1982, sampling plans of household surveys practiced by the NSO uses a Master Sample. As presented, a Master Sample is a sub sampling frame of Primary Units (PU) representative of the initial sampling frame and weighted for all regions of Morocco. The new proposed census capitalizes on this work, undertaken by the NSO. Updating geographic database and maps of PU at the eve of census 2004, concerned all 9093 PU. Each PU is a geographic area of about 600 households. In this scenario, we constitute five sub samples of PU, each representative of all regions of Morocco. This is accomplished by sorting all PU according to geographic code (implicit stratification). Consecutive PU are attributed, using systematic sampling, to one of the five different sub sampling frames. Each year, a sub sample is surveyed exhaustively. Within 5 years, all households are surveyed.

This approach of exhaustively surveying PU offers certain advantages. Cost of data collection in the field could be decreased. PU composed of 4 to 5 districts of census, have ideal sizes of data control. So, areas of data collection and control are within reasonable proximity.

Aerial sampling offers the possibility of reducing sample size. Indeed, considering each annual sample as a sub sample frame, sampling of Secondary Units (SU) could be done. Each PU is composed of 12 SU. Each SU is composed of about 50 households. SU are selected with probability proportional to their size and with sampling fraction different depending on the localities. For communes with less than 10000 habitants, all SU/PU are to be surveyed to reduce sampling errors. Concerning the other communes of 10000 habitants or more, a sample of 50% of SU is proposed, selected with probability proportional to size with households. Secondary units are divided equally among the five sub sample frames. Communes with population less than 10000, represent 20% of total population of Morocco according to Census of population and housing 2004. Each year 4% of the population of this category is surveyed. For the 80% of population that reside in communes with 10000 habitants and more, 8% are surveyed each year. Within five years, 60% of total population is surveyed. This fraction should constitute an important decrease in cost.

Aerial sampling offers the possibility to implement a continuous census, even with the lack of sampling frame of addresses of households. But, this approach requires cartographic operations in continue. Indeed, each year, a sampling frame of PU needs to be divided to secondary units.

Sampling using list of addresses: the advantage of this approach is to attain with smaller sample size, the same precision as a cluster sampling. Prerequisite is to have a reliable sampling frame of household addresses. Cost of developing and maintaining the master frame is justified in the framework of conducting many household surveys. Scanning of all census of population and housing 2004 questionnaire, allowed capturing all household addresses as images. This list, available in database constitutes a good starting point to develop and update a frame of addresses of households.

This scenario is different mainly because sampling unit is a household as opposed to PU/SU. Exhaustive data collection for communes with less than 10000 habitants is maintained. All large communes will be visited. But, only 8% of their population each year will be surveyed. In this scenario smaller sample size is required (52% = 20% * 20% + 8% * 80%)*5). Yearly group of communes and households within communes are equilibrated and representative of regions.

9- Estimators and variances:

Population parameter estimators and variances are presented for aerial sampling scenarios. Census of population and housing 2004 data as well as sampling frame of primary units are used to draw samples, to calculate estimators and to validate their precision against census results.

The first scenario is an aerial sampling of 5 samples of PU. Sampling of clusters (PU) is systematic with sampling step of 5, with different start. Calculation formula of totals and variances follow.

For:

N = Total number of Primary Units;
n = Number of PU of sample;
m_i = Number of households within PUi, i=1,....,N;
M = Number of households of population;
y_i = Total of observation in PUi;

Estimator of population total T:

$$N\overline{y}_t = \frac{N}{n}\sum_{i=1}^{n} y_i$$

Estimated variance:

$$\hat{V}(N\overline{y}_t) = N^2\hat{V}(\overline{y}_t) = N^2(\frac{N-n}{Nn})\,s_t^2$$

Where:

$$s_t^2 = \frac{\sum_{i=1}^{n}(y_i - \overline{y}_t)^2}{n-1}$$

$$\text{Confidence Interval at 95\%} = N\overline{y}_t \pm 2\sqrt{\hat{V}(N\overline{y}_t)}$$

Table 1 shows results of the application of the above formula for the variable number of households. In real conditions, each yearly PU is surveyed in a different year. Since this data is not available, we use census of population and housing 2004 data. Nevertheless, this constraint allows validation of the precision of samples, since inter yearly variance is null.

The national number of households as observed in the traditional census is within the confidence interval (95%) of estimators of the five yearly samples. Results concerning regional and national levels are estimated every year from yearly samples (1989 PU / year). Theses samples are cumulated over five-year period to produce exhaustive

results for small geographic area (i.e., communes). In this case variance is null.

Table 1. Estimated number of households and variances using samples of primary units compared to traditional census

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 5 + 1
Sample	1 126 365	1 135 138	1 134 486	1 129 957	1 129 647	**5 655 593**
National extrapolation	**5 631 206**	**5 675 066**	**5 671 806**	**5 649 164**	**5 650 720**	**NA**
Standard deviation	16 337	16 828	16 907	16 226	16 096	NA
CI (95%)	5 598 531	5 641 411	5 637 992	5 616 712	5 618 528	NA
	5 663 880	5 708 721	5 705 621	5 681 615	5 682 913	NA
Traditional Census	5 655 593	5 655 593	5 655 593	5 655 593	5 655 593	NA

NA: Non applicable

A variation of aerial sampling consists of sampling secondary units instead of enumerating households in all PU. To test this scenario, we use census districts (CD) instead of secondary units (because of the lack of sampling frame of Secondary Units). Each Primary unit is composed of 4 to 5 CD. After constructing five sub samples of PU, we select 50% of CD, with probability proportional to size of households, for communes with population of 10000 and more. PU belonging to communes with less than 10000 habitants are surveyed exhaustively, one fifth every year.

We proceed by constructing two strata according to population size of communes. We get 1577 PU belonging to communes with less than 10000 inhabitants and 7528 PU belonging to communes with 10000 inhabitants and more. Then, we constitute five sub sampling frames: Each has 316 PU within the small communes and 1508 PU within the larger communes. The process is systematic 1:5 within each strata.

Within each sub sampling frame, we drew 50% of CD that belongs to communes of 10000 inhabitants and more. This sampling is done with probability proportional to size of households. This means that CD with a number of household higher then sampling step could be selected more then once. Sampling step is the ratio of the total number of households to the sample size, within the underlying strata.

Estimation formula of population parameter (i.e. total):

$$\hat{T} = \hat{T}_{c<10k} + \hat{T}_{c \geq 10k}$$

$$\hat{T}_{c<10k} = \frac{N_{c<10k}}{n_{c<10k}} \sum_{i=1}^{n_i} y_i$$

Where, $N_{c<10k}$: Number of PU within communes less than 10000 ;

$n_{c<10k}$: Number of PU drawn of communes with less than 10000 habitants;

y_i : Observed variables.

$$\hat{T}_{c \geq 10k} = \frac{N_{c \geq 10k}}{n_{c \geq 10k}} \hat{T}_{pps}$$

Where, $N_{c \geq 10k}$: Number of PU within communes with 10000 habitants or more;

$n_{c \geq 10k}$: Number of sampled PU of communes with 10000 habitants or more;

$$\hat{T}_{pps} = \frac{M}{n} \sum_{i=}^{n} \bar{y}_i \ ,$$

Where, M: Number of household of sub frame;

n: Number of sampled census districts;

$\bar{y}_i$: Ratio of observed variable (e.g. population number) to the number of households in district i.

Variances formula:

$$\hat{V}(\hat{T}) = V(\hat{T}_{c < 10k} + \hat{T}_{c \geq 10k})$$

$$\hat{V}(\hat{T}) = N_{c < 10k}^2 \left(\frac{N_{c < 10k} - n_{c < 10k}}{N_{c < 10k} * n_{c < 10k}} \right)(s_r^2) + \frac{N_{c \geq 10k}^2}{n_{c \geq 10k} * (1 - n_{c \geq 10k})} \hat{V}(\hat{T}_{pps})$$

Where,

$$s_t^2 = \frac{\sum_{i=1}^{n}(y_i - \bar{y}_i)^2}{n_{c < 10k} - 1}$$

$$\hat{V}(\hat{T}_{pps}) = \frac{M^2}{n(n-1)} \sum_{i=1}^{n}(\bar{y}_i - u_{pps})^2$$

$$u_{pps} = \frac{1}{n} \sum_{i=1}^{n} \bar{y}_i, \quad where \quad \bar{y}_i \ is \ the \ average \ of \ cluster \ i$$

Cumulating sample results for communes of less than 10000 inhabitants is a simple addition since they constitute the whole population. For communes of 10000 inhabitants or more, sum of extrapolated results to the commune level is performed.

Table 2 shows results of annual population estimates for communes less than 10000 inhabitants and communes of 10000 inhabitants or more. Population estimates at the national level could be drawn, beginning the first year of the continuous census cycle. Results at the commune level are available after the end of cycle. Results show that all traditional census results are within 95% confidence intervals of continuous census.

Table 2. Estimates and standards deviations of estimated total population at the commune and national level, according to commune population size

		Year 1	Year 2	Year 3	Year 4	Year 5	Year 5 + 1
Communes population <10000	Sample	1 108 439	1 089 959	1 058 500	1 086 170	1 094 145	**5 437 213**
	National extrapolation	5 531 672	5 439 447	5 299 221	5 437 746	5 477 672	NA
	Std. dev.	84 998	82 782	81 361	85 847	80 921	NA
Communes population >=10000	Sample	2 598 795	2 628 423	2 628 362	2 656 786	2 645 129	-
	Extrapolation Commune	4 826 618	4 806 618	4 820 879	4 851 649	4 863 753	**24 169 517**
	Std. dev.	16 314	16 016	16 208	16 194	16 304	-
	Census	4 831 950	4 805 634	4 826 139	4 847 076	4 855 571	24 166 370
	National extrapolation	24 126 688	24 026 717	24 098 000	24 267 905	24 328 450	NA
	Std. dev.	81 629	80 032	81 045	81 030	81 582	NA
National	Extrapolation	**29 658 360**	**29 466 164**	**29 397 221**	**29 705 651**	**29 806 122**	NA
	Std. dev.	117 847	115 143	114 839	118 049	114 908	NA
	Trad. Census	29 576 548	29 576 548	29 576 548	29 576 548	29 576 548	NA

10- Advantages and limitations of continuous census

The foremost advantage of continuous census of population and housing is increasing results frequencies. Data of continuous census are yearly, while data of decennial census could be 10 years old. The large size of continuous census makes it more reliable than other household surveys. Within a five year period the cumulated sample is large enough to produce results at the finest geographical levels. While, decennial census produces demographic and socioeconomic profiles pertaining to small geographic areas each decade, continuous census collect theses information through out the decade. Hence, offering the possibility to produce estimators on the dynamic of small domains. These information is almost non-existent before, is of major use to evaluate governmental initiative and for planning at the private and the public sectors.

Continuous census allows including many subjects and change content/questions every year. Obviously substantial change may affect the comparability of results. This flexibility allows the statistical system to adapt to users need in population information.

Implementation of continuous census is an asset to national statistics system. It entails production of better information, while improving methods and building capacities. Indeed, the permanent character of this operation: mapping activities, data collection, computerized processing of questionnaires, data analysis and dissemination of data lead to establishment of center of excellence in production of statistics. During

decennial census, thousands of surveys are temporarily recruited. Due to time constraints, these temp employees undergo limited training. In contrast, in case of continuous census, surveyors acquire experience in the field of surveying. Finally, updating of continuous sampling frame, improve the quality of others household surveys conducted by different departments.

Cost wise, continuous census is carried out with the same yearly budget. This allows for spending rationalization and continuous evaluation of results. Decennial census requires large sums of money within a short period of time. Investments in training of temporary personnel are not amortized. In addition, purchased new technologies are not necessarily re-used in the next decennial census.

Even tough the benefits of continuous census are extensive, elimination of decennial census present some issues. Indeed, users used to get detailed information for all geographic units with reference to a specific date, need to adapt to the concept of moving average, where estimators reference to a longer period of time. Also, comparability between different geographic areas could be challenging. Hence, change to a new system requires increasing awareness among potential users.

11- Conclusions and recommendations
The need for recent demographic and socioeconomic information at the community level can be satisfied by adopting innovating methods of conducting censuses of population and housing. A continuous census, with a five year cycle, will produce annual results representative of all geographic levels of Morocco. The cost of data collection, traditionally spent on a short period, every ten years could be spent though out the decade.

Renovating the census is a logical continuity of national statistical system undergone by the High Commission for Planning (HCP). The new census will allow updating sampling frame more frequently. Availability of recent Master sample or a sampling frame of household addresses, will increase the reliability of household surveys conducted by the HCP, as well as by other department.

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