Agricultural censuses: importance, challenges and opportunities in the developing world

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ABSTARCT

Agricultural censuses although not in existence for as long as population censuses, have been around for a while. Agricultural censuses are designed to measure the extent of agricultural activity in any given country. Agricultural censuses are important to both the developed and developing world economies. The significance of agricultural censuses, however, is more pronounced in the developing world, in which agriculture is the source of livelihood to the majority of population and is usually the largest contributor to national gross domestic product. In the developing world, therefore, the importance of agricultural censuses cannot be divorced from that of the agricultural sector, which the censuses are designed to measure.

The challenges of conducting an agricultural census in the developing world are immense, but a number of opportunities do exist for these regions. In recent years, agricultural censuses have progressed from collecting information traditionally classified as farming to forestry, fisheries, rural and environmental statistics, complicating the situation further for developing regions already struggling with resources for this purpose.

This paper is an attempt to unpack the importance, challenges and opportunities for agricultural censuses with specific reference to the developing world. The paper further explores the opportunities behind the integration of agriculture and rural statistics into the population census and reports on the South African experience.

Key words: *Agriculture, population, census, developing world and statistics.*

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1. INTRODCUTION

Most constituents of the developing world are located in Africa, South Eastern Asia and South America.

The importance of agricultural statistics in the developing economies of the world can never be over emphasized. Agriculture in many developing countries of the world contributes the greatest portion of the gross national product (GDP), is the single largest employer and the source of livelihood for the majority of people. Since the majority of the population in these countries live in rural areas, the importance of agriculture and its potential in uplifting the standard of living of the rural poor is difficult to overlook. In Uganda for example, agriculture provides employment and livelihood to about 80% of the population. A similar picture is to be expected in most countries in the region.

It should be mentioned, however, that agriculture may not always be the leading contributor to GDP in developing economies. Depending on country specifics, mining and tourism may take centre stage in some countries.

The Food and Agriculture Organisation (FAO), has in the past decades, spearheaded a number of initiatives to guide and drive agricultural statistics, such as the Global Strategy for the improvement of agricultural and rural statistics (FAO, 2010). These initiatives have contributed greatly towards addressing the challenges faced by the developing world.

2. IMPORTANCE OF AGRICULTURAL CENSUSES TO THE DEVELOPING WORLD

The importance of agricultural censuses cannot be divorced from that of the agricultural sector at large. Thoroughness and promptness are important in the measurement of the largest and most important sector in any the country. In addition, the importance of the sector dictates that the censuses are conducted at a regular frequency. For the reason that they collect more accurate and detailed information, agricultural censuses are of additional importance in these economies.

Briefly, agricultural censuses are important for the following reasons:

- In addition to the number of people/households/entities involved in agriculture, agricultural censuses provide accurate information on the structure of agriculture and farming practices in a country;

- Provide value of production (and also income), pricing and input use in agriculture; and

- Agricultural censuses provide country production information for crops, livestock, forestry and fish products also land and water use, degradation and conservation.

All the above information is critical for policy and informed decision making for private and public sector alike.

3. CHALLENGES FACING THE DEVELOPING WORLD

Developing countries are exposed to a number of challenges. Most of these challenges are related to the political, economic and political circumstances, unique to these economies. Some countries in Africa, for example have not been able to conduct any comprehensive agricultural census due to political upheavals in part of their territories.

Most governments in these regions prefer to invest in projects with maximum political visibility, which agricultural censuses do not posses. Lack of political visibility unfortunately leads to low political will to conduct agricultural censuses. Other challenges are listed below:

- **Limited funding for agricultural Censuses**

Developing countries run on constrained budgets, yet the agricultural censuses they are required to conduct are very costly exercises. The censuses in these economies have to compete with a number of other developmental priorities for funding such as health (HIV and malaria), educational and other campaigns, which are usually perceived more pressing than agricultural censuses. There is simply not enough money to go around. Budgetary constraints usually relegate agricultural censuses to external/donor funding. The usual practice, in light of budgetary constraints, is to limit coverage by geographic detail and variables collected (Marshall, 2010).

- **Skills shortage**

After limited funding, the shortage of agricultural statistics skills is perhaps the biggest challenges facing the developing world. Skill shortage directly impacts on the countries' capacity to generate quality statistics. It all stems from the kind of training provided in the countries under discussion. The training offered provides little in terms of linkage between agriculture and statistics. Ideally, an agricultural statistician should be a professional appropriately versed in the biological, statistical and economic[2] aspects of agriculture. The professional should in summary be an agriculturalist with deep knowledge of applied statistics.

Also related, but separate from skill shortage, is the low overall level of literacy in these regions. This implies that applications like self enumeration in agricultural census questionnaires become redundant. Enumeration costs per questionnaire escalate because most farmers have to be visited for the completion of questionnaires.

- **Infrastructural challenges**

The developing world is faced with numerous infrastructural challenges. Most are linked to the under development of road infrastructure due to lack of resources and neglect. Whatever the underlying reasons, the consequences are absence and/or impassable roads in the rural areas, where the agricultural households are located.

[2] Biological aspects such production potentials of various crops, trees and livestock. Statistical aspects such imputation, outliers etc. Economical aspects such production possibilities and prices.

Although, mobile phone and internet connections have in the recent decades, greatly improved telecommunication in the rural areas of the developing world, many are still to be covered. Internet access and usage remains low in developing countries. Low internet access coupled with low literacy rates, dictate that questionnaires have to be posted and field visits are unavoidable.

A number of these countries are rapidly broadening electricity supply to rural areas, but the task at hand is enormous. Since most census equipment requires electric power for charging and operation. A large number of census personnel, in these regions, are often left with no option but to commute to and fro a major urban centre and the field, further inflating the cost of agricultural censuses.

- **Changing national and global trends in the demands for agricultural statistics**

The demand for agricultural and rural statistics has changed over the years. There are new demands there were not there before. As the world changes, new demands emerge e.g. environmental degradation and the need for statistics to track water and soil degradation. In addition, the definition of agricultural statistics has broadened to include forestry and fisheries. Gender issues and minority populations are also increasingly becoming frontline issues in agriculture and rural development. The changing trends in the demand of agricultural and rural statistics are stretching budgetary and skills requirements of the institutions involved to levels never experienced before.

- **Respondent fatigue**

Most governments in the developing world now recognize the importance of statistics for informed policy formulation, administration, monitoring and evaluation. However, collection of these statistics has inevitably created untold burden to respondents that on some occasions are required to participate in up to four (4) surveys a year. The result is low response rates in agricultural censuses.

Various approaches to improve public awareness can be utilised in addressing this challenge. In the South African for example, there is a dedicated publicity team to for agricultural censuses and surveys. The publicity team conveys sponsorship, attends and addresses organized agriculture meetings and congresses. Print and electronic media are also used in the team's stakeholder outreach programmes. Increased awareness campaigns improve respondent and public appreciation for agricultural statistics. The opportunity here is improved response rates.

Also equally beneficial, is the integration of agricultural statistics modules into other survey areas. For example, the process of the integration of agricultural and rural statistics, in South Africa, started with the population census in 2011. The following questions were included in the population census questionnaire of 2011:

1. What kind of agricultural activity is the household involved in;
2. How many animals (by category) do you household own?
3. Where does the household conduct its agricultural activities?

By integrating agriculture into the population census, a household frame of agricultural activity in the country can be compiled. This process eliminates duplication of costs, since a single budget, manpower and other resources are used. Finally, by integrating agriculture or any other survey into another survey area, the number of questionnaires and therefore the burden on respondents is reduced.

- **Lack of Master sampling frames (and in some cases lack of an agricultural statistics strategy)**

The structure of the agricultural sector in these countries is mainly composed of commercial and household based farming units. It is unusual for a country to display an equal distribution, by number, between commercial and household based farming units. The common scenario is dominancy of one component over the other. In South Africa, the household based farming units dominate over the commercial units (in number) despite the fact that the latter are more organized and resourced. This is the most likely scenario in most regions of the developing world.

On average, due to their small proportion, the sampling frame for commercial farming units is usually comprehensive. The challenge usually arises from compiling the household based frame. Including an agricultural module in the population census questionnaire, identifies these households and usually resolves this challenge. Without the integration of agriculture into the population census, the frame development exercise would be exorbitant, for any of these countries to afford.

It can safely be said that most of the challenges mentioned above may be linked to the absence of a national agricultural statistics strategy. The implications can be far reaching for an agricultural census or survey. The consequence is low quality statistics, collected in an uncoordinated and costly manner.

A brief discussion of South Africa's experience is provided under the recommendation section.

4. OPPORTUNITIES

The following opportunities do exist for agricultural censuses in the developing world:

- **Improved political will and donor funding**

Increasing empirical evidence, in favour of agriculture's potential in uplifting the livelihood of the rural poor, is drawing increasing political attention for the need to measure the sector. There is improved political will and increased international donor funding for agricultural censuses in developing countries.

- **Technological advancements**

Technological innovations such as satellite technology (imaging, collection, transmission, measurement, communication and data sharing), GIS, GPS, analytical computer packages, mobile phones and internet are improving accuracy, communication, and access to previously inaccessible rural areas. The benefits are shorter 'turn around times' and better quality data for agricultural censuses.

Additionally, innovations in information technology have increased the opportunity to 'share and learn from others'. The opportunity, for agricultural censuses, lies in cost reduction and data quality improvement associated with information sharing. These regions are now able to avoid costly mistakes by learning from the experience from other countries. Technological innovations, such as satellite imaging, are also paving way for less intrusive data collection methodologies.

- **Integrated approach**

The opportunities availed by linking the agricultural census to the population census or integration into other surveys have been discussed in the preceding section of this paper. The highlight in this section is cost reduction (by eliminating duplication), improved depth, width and versatility of agricultural statistics.

5. RECOMMEDATIONS

A lot still has to be done towards raising awareness and educating the general public about the importance of agricultural statistics and other statistics. Public awareness campaigns need to be stepped up. Awareness campaigns should be targeted in nature-towards different categories of respondents.

As mentioned earlier, low literacy rates reduce farmers' ability to complete questionnaires on their own. Programmes designed to improve literacy in rural areas are also recommended.

National and possibly regional investment in rural infrastructure improves access to rural areas and in the long run reduces the cost of running agricultural censuses and surveys.

Finally, countries in these regions are advised to develop and implement national agricultural statistics strategies designed to address most of the inherent challenges mentioned earlier. National agricultural statistics strategies are able to address:

- Poor capacity in agricultural statistics;
- Data quality (gaps, depth and width);
- Poor coordination and efficiency use of resources within the sector; and
- To guide quality assurance, standardisation and certification in the agricultural statistics.

For improved synergies, a regional approach is recommended for training agricultural statisticians.

5.1 Recommended steps strategy formulation process

The following discussion is based on the South African experience, which is anchored on the Action plan for Africa 2011-2012 for improving statistics for food security, sustainable agriculture and rural development (AfDB & FAO.2011). The agricultural strategy development process in South Africa is based on the following steps:

5.1.1 Research

A study to analyse all the aspects concerning the provision of agricultural statistics in a country should be conducted. In this study, data gaps, producers, users, and skill gaps etc. should identified. It is highly advisable that this research involves both a desk and field study. Investigations on international best practice should form a major component of the desk top study. This study should culminate into a report/discussion document.

5.1.2 Stakeholder meeting to discuss study findings

A stakeholder meeting to discuss and derive consensus on both challenges and recommendations is suggested. In this meeting, the actual specifics regarding the country's core and supplementary modules are agreed upon. Recommendations to address challenges such as definitions, data quality and skills shortages are coined. It is proposed that this meeting is constituted of the most important stakeholders in the sector, both at the data producer and user levels. Depending on the complexity of the country's agricultural sector, several consultative meetings may be required to reach consensus. This stage culminates into a document specifying agreed definitions, variables and collection frequencies required.

5.1.3 Formation of a national agricultural statistical subsystem (NASS)

This stage deals with the coordination, assignment of roles and designing a regulatory frame work for agricultural statistics in a country. Data producers and users are organized and coordinated into the NASS. The phase usually involves the formation of the National Agricultural Statistics Steering Committee (NASSC). The NASSC[3] coordinates agricultural data producers and users and provides research and advisory functions to the NASS and agricultural statistics in a country. The NASS forms one of the building blocks of the South African National Statistics System (SANSS) discussed in the next section.

5.1.4 Integration of NASS into the national statistical system (NSS)

The first step in the integration of agriculture and rural statistics into the NSS is the incorporation of some agricultural module into the population census. This process, for South Africa, has been discussed in detail in previous sections of this paper.

Integration of the NASS into SANSS subjects NASS, and other statistical subsystems to the following:

- ***Certification and quality assurance of statistics***

All statistics generated under any subsystem under the SANSS is subject and evaluated according to the stipulations of the South African Statistical Quality Assessment Framework (SASQAF) before they are granted the official statistics status. Statistics

[3] Proposed composition for South Africa: Departments of Agriculture Forestry and Fisheries, Rural Development and Land Reform, Water and Environmental Affairs, South Africa; The Office of the President of the Republic of South Africa; Universities; and Provincial nominees.

South Africa is the only entity in the country mandated to evaluate and certify statistics produced by any public or private entity and to confer the official statistics status.

- ***Standards***

Standards are set to promote consistency in the methods and results of surveys and censuses. This involves the development of sector, national and internationally agreed classifications, concepts and definitions.

- ***Coordination***

All generation of agricultural statistics, and indeed other statistics, in the country are governed by the Statistics Act[4]. Legal agreements in form of Memoranda of understanding or Service level agreements are designed to enforce compliance.

6. CONCLUSION

Although the challenges facing agricultural censuses and surveys in the developing world are numerous, they are not insurmountable. Innovation is creating opportunities which should vigorously be exploited. Other opportunities to be exploited include improved political will and donor funding, technological advancement and integrated survey approaches for agricultural statistics.

While the development of an agricultural statistics strategy should be every country's first step in addressing the challenges afflicting agricultural censuses and surveys, the strategy in itself cannot and will never address all the challenges faced by agricultural census and statistics as whole.

FAO's initiatives have contributed greatly towards addressing the challenges faced by agricultural censuses in the developing world. However, addressing these challenges (e.g. low capacity) will continue to demand a lot in terms of resources, scarcity of which is the main reason these countries are in this situation in the first place.

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