



منظمة الأعدنية
والزراعة
للأمم المتحدة

联合国
粮食及
农业组织

Food
and
Agriculture
Organization
of
the
United
Nations

Organisation
des
Nations
Unies
pour
l'alimentation
et
l'agriculture

Organización
de las
Naciones
Unidas
para la
Agricultura
y la
Alimentación

Agenda item 7

STAT-EMPOWER-19
September 2009

Expert Consultation on Statistics in Support of Policies to Empower Small Farmers

Bangkok, Thailand, 8 -11 September 2009

SCHOOLS AND STATISTICS:

**INVOLVING PARENTS, TECAHERS AND STUDENTS IN
GROUND-TRUTHING OFFICIAL STATISTICS IN BHUTAN**

**Expert Consultation on Statistics in Support of Policies to Empower Small Farmers,
Bangkok, Thailand, 8-11 September 2009.**

**SCHOOLS AND STATISTICS: INVOLVING PARENTS, TEACHERS AND
STUDENTS IN COLLECTING AND VERIFYING OFFICIAL AGRICULTURAL
STATISTICS IN BHUTAN**

**Kuenga Tshering, Director, NSB, Bhutan
and
Kinlay Dorjee, Economist, ESA, FAO**

I. Background

Bhutan is a small mountainous country with an area of approximately 39 thousand square kilometers and is situated in the eastern Himalayas bordered by India to the south and China in the north. It has a parliamentary democratic form of government since 2008, with the Prime Minister and other elected officials running the government and the King as the Head of the State. As per the 2005 Population and Housing Census (PHCB2005) the country has a population of 635,000 people, with about 70 percent living in the rural areas and practicing some form of agriculture. The agriculture practiced is of mixed subsistence type where farmers combine cattle rearing with crop cultivation. The major crops are paddy, maize, wheat and buckwheat with major cash crops like potato, apples, oranges, cardamom, ginger etc. Farming is practiced in the major river valleys and along the southern foothills bordering India. Only about 8 percent of the land is arable, the rest is mostly rugged and covered in forest and shrubs.

The country had remained isolated from the rest of the world till the beginning of the 1960s. It was only in 1961 that the country embarked on its First Five Year Plan. Since then the country has made commendable achievements in terms of socio-economic development. The largest economic sector is the water and electricity, accounting for almost 24 percent of the GDP followed by agriculture and forestry, accounting for about 19 percent. The country's major trading partner is India with almost 80 percent of the total trade. The bulk of the export consists of hydroelectricity, earning almost 45 percent of the total exports and the rest are fruits and vegetables and minerals.

Modern education was introduced in the country only towards the end of 1950s and today with over 500 schools and institutes spread all over the country, literacy rate is estimated at 59 percent in 2005. With gross and net enrollment ratios of 112 and 85 percent respectively, the education sector provides free and compulsory education up to the 10th standard. Beyond this, it is free for those that can make the cut-off marks derived from the availability of seats in the education system.

According to the PHCB 2005, average life expectancy is estimated at 66.3 years with infant mortality rate at 40 per thousand live births. Almost 90 percent of the population has access to health facilities and more than 90 percent to piped drinking water. More than 72 percent (BLSS 2007) of the households in the country have electricity in their homes, with 98% in the urban and 60 % in the rural areas. The country is committed to providing electricity to each and every household in the country by 2015. More than 58 percent of the households are within less than one hour walking distance from a motor road point (PHCB 2005).

Based on the national poverty line of approximately Nu. 1100 (Poverty Analysis Report 2007), about 23.2 percent of the population are estimated to be poor, with rural poverty estimated at 30.9 percent and 1.7 percent in the urban areas.

The Tenth Plan, which is being implemented, has accorded top priority to reducing poverty - particularly in the rural areas. The target is to reduce the poverty level to 15 percent by the end of the Plan period (2013/14), which is also the target in achieving one of the UN's Millennium Development Goals of halving poverty level by 2015. With the country's development philosophy of Gross National Happiness (GNH), the Royal Government is committed in not only bringing about material development but a well balanced development that includes mental and spiritual well-being of the people through the four main pillars of GNH – i) equitable and sustainable socio-economic development; ii) preservation and promotion of culture; iii) environmental conservation; and iv) good governance.

II. Statistical System in Bhutan

The statistical system in Bhutan is still in its infancy and has been undergoing a lot of changes in order to establish a system that best serves the country's ever growing data/information needs. In fact the system was initiated only in 1971 when a small Cell was established in the then Ministry of Development. Prior to this all data was collected on an ad-hoc basis by individual organizations based on their immediate needs. With the growing demand for statistical data from the government agencies and development partners the Cell was then upgraded to a Division and named as the Central Statistical Organization (CSO) within the then Planning Commission Secretariat in 1978.

In the early 90s the government felt that since Bhutan being a small country, the then Central Statistical Organization could fulfill all the data needs of the country and having various statistical establishments in the line ministries and departments was a waste of resources and also quite often led to duplication of efforts resulting in data inconsistencies. Therefore in 1992 all statistical activities of the government were centralized within the CSO. However, the centralization process resulted largely in transferring only the statistical responsibilities and not other resources like equipment, manpower etc. This situation, therefore led to the CSO being overwhelmed with the task of meeting increasing data demands from the various sectors with hardly any additional resources like manpower and funds. Also, the CSO did not have the capacity within its staff to carry out various types of data collection and analyses as needed by the different organizations.

Hence the Royal Government in 1998 again initiated a restructuring of the statistical system whereby the statistical responsibilities were given back to the respective ministries and departments. In 2004 with the major restructuring of the government the CSO was renamed as the National Statistics Bureau (NSB) and granted an autonomous status directly under the Office of the Prime Minister. Hence today the statistical system is largely decentralized with the respective organizations collecting their own sector data and the National Statistical Bureau serving as the national apex statistical body to develop and strengthen the national statistical system and also coordinate and provide technical support where needed.

III. Main Issues and Problems Faced by the Statistical System

Although the statistical system has made a lot of progress in terms of basic data collection and dissemination the system has a long way to go in the areas of developing standards and methodologies that are in line and comparable to international standards. Bhutan, like many other developing countries, is confronted with many problems in developing an efficient and reliable statistical system. There are however two main issues or problems that warrant immediate attention in order to kick start the development of a sustainable statistical system.

The first major issue facing the country in terms of statistical development is the acute shortage of qualified statisticians. This was largely due to the fact that in the earlier times most of the qualified students with the pre-requisite subject – mathematics, for statistics courses opted to go for other courses like engineering and medicine as these professions enjoyed a higher grade entry level while joining the civil service. Although the government has recognized the problem and has resolved the entry levels with the other professions, it will be sometime to come when the system will have enough well trained and experienced statisticians. At present most of the ministries and departments do not have qualified or trained statisticians and therefore the planning officers or someone with no statistics background is given the responsibility to look after the statistical activities of the organization. Even where there are trained people, there are not enough of them. Thus, as mentioned above, many of the organizations frequently face problems data shortages and gaps as well as outdated and unreliable data.

The other major problem is bringing about a well coordinated system of statistical activities in the country so as to avoid duplication and wastage of resources and other problems like data inconsistencies etc. Being a small country, coordination of activities is expected to be not much of a problem, but the shortage of regular funds for conducting surveys and censuses has brought about uncertainties due to dependence on ad hoc funding, leading to difficulties in developing national statistical plans and activities. Most of the data collection activities are therefore driven by immediate needs, for instance project based, and are highly dependent on donor funding. Such funding or activities are mostly for one-time data needs of the project and do not have continuity into the future on a regular basis. Also, such data are collected and analyzed by some foreign experts without little transfer of the knowledge. Sometimes of course the national counterparts do not have the capacity to absorb the knowledge due to lack of basic qualification.

There is an urgent need to have a masterplan and national strategy for developing an integrated national statistical system with clear delineation of functions, roles and responsibilities for line Ministries and NSB. It is proposed that the network of schools be used for collecting, verifying and disseminating agricultural statistics at the community level. The Global Strategy is a timely guide for Bhutan's formulation of a masterplan for developing an integrated national agricultural statistical system.

IV. Agriculture Statistics and Timely Information Dissemination

Statistical data in the agriculture sector has always been a problem in terms of its accuracy, timeliness, and coverage despite concerted efforts by the government, in particular the Ministry of Agriculture. Several assistance were sought from organizations like the Food and Agriculture Organization (FAO), UNDP and other bilateral donors to build a sound baseline data for the sector. Several nationwide data collection efforts were undertaken with the help of the donors and experts. Once the assistance stopped, data collection also usually stopped largely because of limited staff capacity and shortage of funds. Therefore, information in the sector is still very weak with major data gaps remaining to be filled.

There is no regular system for updating and verifying information on the agriculture sector. Unlike most other countries, the agriculture sector in Bhutan does not have any statistical offices or personnel in either the regions or districts. At present most data are based on administrative reports from the extension workers who do not have any sort of training in statistical data collection and most of whom are overburdened with several development activities and daily administrative responsibilities on which they are evaluated for promotion and for foreign training. In fact this is one reason why data received from them are mostly found to be inconsistent and usually of poor quality. Also, there would always be a tendency to introduce biasness when reporting on their sector and its performance.

With almost 70 percent of the population engaged in agricultural activities and accounting for almost one fifth of the annual GDP, the development of statistical information of the sector is vital to tackling poverty in the country. In fact the Poverty Analysis Report 2007, based on the Bhutan Living Standard Survey 2007, indicate that poverty in Bhutan is largely a rural phenomenon with almost 31 percent of the rural people, as compared to 1.7 percent in the urban, contributes to over 98 percent to the national poverty headcount. Therefore if ever the government is to prove its seriousness about GNH there is an urgent need to develop and establish a good system of regular, timely data collection and information generation and dissemination network not only at aggregated levels but at local levels to tackle the issue effectively.

It is not only data collection or availability of information that is important but equally so is the timely dissemination of the information to the right people. Today we have all sorts of advanced technologies that are cheap and easily accessible to a common man such as the radio, the mobile phone, Television, daily print media etc. which allow for real-time information to be disseminated. Such information on trading and market prices could save the farmers, particularly the small farmers, to plan the marketing of the little extra they have for the market, so that they fetch good prices and be encouraged to produce more in the future.

An example of poor market information is the marketing of potatoes in 2008 from the two dzongkhags of Bumthang in the central region and Wangduephordang in the west. All the potato farmers from the two dzongkhags took their harvest almost around the same time to the border town of Phuentsholing to be auctioned to the Indian buyers and as a result faced huge price falls. Some farmers claimed that they could not even recover their transportation charges and experienced severe losses. It is not that the government or the media in the country does not give out market information but it is the problem of having a well established system that provides reliable and timely market information. Such information networks could also be used to promote farming methods as well as new crops.

V. CountrySTAT Bhutan as the foundation for the future

As an initial step towards improving the system of agricultural statistics in Bhutan FAO has introduced CountrySTAT-Bhutan. This is a web-based system for dissemination of harmonized national food and agricultural statistical data along with metadata for analysis and policy making. In recognition of the existing and potential uses of the CountrySTAT, the Ministry of Agriculture, Royal Government of Bhutan has taken on the challenge of establishing the CountrySTAT. The system contains mainly of regularly updated statistical data on land use, agricultural (crops, livestock and forest) productions, exports and imports of agricultural products, agricultural inputs, commodity prices, farm machineries, and development infrastructures. It also provides links to relevant official documents and statistical websites around the globe.

Relation to FAOSTAT

The CountrySTAT-Bhutan shall serve as a complementary system to FAOSTAT. Its outputs are designed to load easily into FAOSTAT. This process or flow, as envisioned in the development of this system, ensures only one source for the data and improves FAOSTAT's capacity to provide high quality statistical data at the international level. Following the FAOSTAT framework, the CountrySTAT shall have statistical data series surrounded by statistical metadata.

Organization of CountrySTAT-Bhutan

The databases in the CountrySTAT-Bhutan are organized under three major groups: national core, district level (dzongkhags) and sub-district level (geogs). The national core contents the data consolidated to national level and shared with FAOSTAT database while the district level and sub-district level data are those disaggregated to sub-national levels with more relevance to national plan and policy makers, researchers and projects intended for rural development. This arrangement provides end-users with the possibility of navigating through the databases from either geographic or thematic paths.

The development of the CountrySTAT-Bhutan was started in June 2007 at the Policy and Planning Division of the Ministry of Agriculture and completed in the first week of March 2008. The project was supported by the FAOs Netherlands Partnership Programme (FNPP).

Metadata for the National Agricultural Statistics

The CountrySTAT system requires the preparation and publication of good metadata. All the databases and statistical tables posted in the CountrySTAT are adequately backed up by metadata. The detail metadata on the national food and agricultural statistical system is summarized in Annexe 1.

VI. Establishing a System of Involving the Local Schools & Geog Administrations in collecting agricultural statistics.

Most of the nationwide surveys demand a lot of resources and a country like Bhutan which is highly dependent on donor funds cannot carry them out frequently. Even if it was possible to do so, these surveys allow estimates at only certain aggregated levels. Past studies show and it is also correct to assume that pockets of poverty will exist even in those areas considered highly well-off. Therefore for this very reason there is a need to collect data at the lowest geographic or administrative levels in order for the development interventions to focus or reach their target population in order to have maximum impact and achieve the intended objectives. Also with the present shortage of funds and staff faced by most organizations, there is an urgent need to look into alternative methods of regular data collection in a cost effective way.

This paper therefore proposes a new system of data collection and information dissemination by involving the school and institutes within the local communities and integrating some of the administrative data collection procedures into the proposed system for enhanced reliability, timeliness and cost-effectiveness. It could be piloted in one or two dzongkhags and if successfully implemented, the system could be established throughout the country, and also tried out in countries where similar problems of data collection exist. If successful it is expected to have huge cost savings by avoiding surveys that are usually very expensive and time consuming.

VII. Advantages of the System

Today there are about 542 schools and institutes, excluding 747 non formal education centres, in the country. The schools are well spread throughout the country, even the remotest of places have community schools and extended classrooms and therefore the inclusion of the people in the remote areas who are generally the poorest can be covered.

The school agriculture program that is in place in the school curriculum could be the place where this idea can be implemented. A statistical club could be formed with a teacher, preferably a mathematics teacher, as the head. Training could be given basic data collection and simple analysis of data. As an incentive some small funds and other simple support and incentives could be provided to the club and the members to carry out the job. Agriculture statistical staff as well as District Agriculture Officers/extension workers could visit the clubs regularly to monitor the works and give back-up support and, also discuss and resolve issues that may arise during their data collection activities.

Almost every household with children of school-going age has a child in the school and therefore using the children to collect simple but important data could be much cheaper and effective. Also, such a method may help in getting rid of the suspicion and fear of revealing the facts or truth to enumerators and officials during formal surveys. Parents or the farmers themselves will be involved in collecting and recording data with their children and therefore the activity will create interest as well as educate them. Another important aspect that such a system of data collection on a timely and regular basis will help to resolve the seasonality issue or factor in data collection.

Most agriculture products, particularly crops, are highly seasonal and for a country like Bhutan it is near impossible to collect data frequently due to lack of field staff and the cost involved. This will also in a way help to control for errors resulting from memory lapses that respondents suffer when asked in regular surveys to respond to questions relating to past events. The reliability of data is expected to improve because of better response rates and wider coverage as compared to regular surveys. Besides the above advantages, one important development from such a system will be the development and creation of a data literate society in future.

Children will be exposed to practical mathematics and they will come to understand why they learn to calculate averages, ratios etc. It will not only incite interest in the subject but also develop analytical young minds in the future citizens of the country. Today many people, including senior government officials and politicians, do not take much interest in facts and figures or data in general. Many seem to suffer some sort of phobia when it comes to numbers. They think looking at numbers, particularly statistical figures, is boring because most do not seem to understand the procedures of statistical estimations. Due to such an attitude many of the programs or projects do not end successfully or do not impact where they are needed the most.

With the new parliamentary system of government in Bhutan, many politicians are eager to find out and learn about various socio-economic conditions in their constituencies, and they usually want information at the lowest levels or units which are rarely available from surveys. The other option is to get them from censuses but they are usually carried out in intervals of 5 to ten years, as is the case in most countries. Hence data collected by students and teachers in the communities can be an important step in collecting regular and more reliable data at community or village levels in a cheap and efficient manner. Such data can be posted on boards in places where people or communities gather so that they are not only given access to information on their communities but also provide them

with substantive backing while seeking funds from the central or local governments through their representatives. The information can also be used to evaluate their representatives when they seek re-election and therefore will keep them on their toes rather than making false promises and getting away with it.

Although initially this system could be piloted for agriculture data collection and, if successful, it could be tried out and established in other sectors like education, health etc.

As teachers are overburdened during the academic year it may be best to time the major task of collecting, checking and collating the production data during the winter break in the months of January and February. This way the past year's production could be estimated for each household at the time of the normal census exercise which is conducted in each community every year. The heads of households who have completed their registration census could continue to provide a very simplified set of information on the following items so that MoA could produce the production estimates for the past year:

Rice
Wheat
Maize
Potatoes
Chillis
Apples
Oranges
Etc.

The yields for the year could be estimated objectively by using the student Agriculture clubs to undertake crop cuts/ harvest fruits of trees/ to arrive at local average yields for that year. This would provide a very reliable estimate of yields and be important for agriculture researchers.

This approach if found viable could be applied by other sectors and countries. The school calendar could be a useful basis for planning all major data collection activities in a coordinated and harmonized manner.

VII. Issues

Involving schools, teachers, students and parents in collecting and verifying agricultural data will be cost-effective and sustainable. Based on the PHCB 2005 experience we know that it is certainly feasible and desirable to use school teachers and students for enumeration and processing of data to arrive at simple averages and ratios. However there may be resistance to this proposal from the institutions who consider themselves overloaded. Teachers across the country are already complaining of work overload and hence will the teachers be willing to get involved? Likewise will the children have enough time to take on this extra activity? Can standards and methodologies be maintained? A child may take this activity as a regular home assignment and may try to complete the forms on his own without visiting the households. Will local influential

people or politicians try to influence the results or outputs to their advantage or vested interest once they know the value of the data being collected by local schools? etc.

Although these and many more problems or question will have to be confronted and resolved out, the advantages in terms of huge cost and manpower savings as opposed to conducting surveys, and other advantages like the level of coverage, reducing the errors due to memory lapses, regularity and frequency of data collection are in itself worth trying out. As mentioned earlier in the paper, it could be piloted and if the system does not work and needs to be abandoned there is little loss as the system does not require huge investments like conducting a regular nationwide survey.

This alternative is certainly worthy of experimentation in the context of Bhutan and similar countries.

TABLE OF CONTENTS

Page

List of Acronyms iii

CHAPTER 1. NATIONAL SYSTEM OF AGRICULTURAL STATISTICS

1.1 Legal Framework and Statistical Advisory Bodies	1
1.2 Structure and Organization of the Major Agricultural Statistical Agencies.....	1
1.3 Outputs and Dissemination of Agricultural Statistics.....	4
1.4 Dialogue with Data Users and Cooperation with International Organizations..	5
1.5 Strategic Framework	5

CHAPTER 2. MAJOR DOMAINS AND SELECTED INDICATORS OF AGRICULTURAL STATISTICS

2.1 List of Major Domains and Selected Statistics and Indicators.....	6
2.2 Metadata for Each of the Major Domains	6

2.2.1 Production

2.2.1.1 Concepts, Definitions and Classifications.....	6
2.2.1.2 Coverage, Availability, Data Sources and Responsible Agencies .	7
2.2.1.3 Data Processing, Estimation and Revision Methodology.....	7

2.2.2 Land Use

2.2.2.1 Concepts, Definitions and Classifications.....	7
2.2.2.2 Coverage, Availability, Data Sources and Responsible Agencies .	8
2.2.2.3 Data Processing, Estimation and Revision Methodology.....	8

2.2.3 Agricultural Inputs

2.2.3.1 Concepts, Definitions and Classifications.....	8
2.2.3.2 Coverage, Availability, Data Sources and Responsible Agencies .	8
2.2.3.3 Data Processing, Estimation and Revision Methodology.....	9

2.2.4 Rural Infrastructures

2.2.4.1 Concepts, Definitions and Classifications.....	9
2.2.4.2 Coverage, Availability, Data Sources and Responsible Agencies .	9
2.2.4.3 Data Processing, Estimation and Revision Methodology.....	9

2.2.5 Trade

2.2.5.1 Concepts, Definitions and Classifications.....	10
--	----

Metadata for National Agricultural Statistics in Bhutan

ii

2.2.5.2 Coverage, Availability, Data Sources and Responsible Agencies .	10
2.2.5.3 Data Processing, Estimation and Revision Methodology.....	10

2.2.6 Prices of Food Commodities

2.2.6.1 Concepts, Definitions and Classifications.....	10
2.2.6.2 Coverage, Availability, Data Sources and Responsible Agencies .	11
2.2.6.3 Data Processing, Estimation and Revision Methodology.....	11

2.2.7 Agricultural Credit

2.2.7.1 Concepts, Definitions and Classifications.....	11
2.2.7.2 Coverage, Availability, Data Sources and Responsible Agencies .	12
2.2.7.3 Data Processing, Estimation and Revision Methodology.....	12

CHAPTER 3. MAJOR DATA SOURCES FOR AGRICULTURAL STATISTICS

3.1 List of Major Agricultural Censuses, Surveys and Registers.....	12
3.2 Metadata for the Major Census	12

3.2.1 RNR Census

3.2.1.1 Overview.....	13
-----------------------	----

3.2.1.2 Census Design	13
3.2.1.3 Conduct, Operations, Data Quality Control	14
3.3 Metadata for Each of the Major Surveys	
3.3.1 RNR Surveys	
3.3.1.1 Overview.....	15
3.3.1.2 Survey Design	15
3.3.1.3 Conduct, Operations, Data Quality Control	15
3.3.2 Annual Agriculture Survey	
3.3.2.1 Overview.....	16
3.3.2.2 Survey Design	16
3.3.2.3 Conduct, Operations, Data Quality Control	16
3.4 Metadata for Each of the Major Administrative Registers	
3.4.1 Animals Slaughtered for Consumption	17
3.4.2 Timber and Non-Timber Forest Products	17
3.4.3 Trade	17
3.4.4 Inputs Supply.....	18
3.4.5 Land Use	18
3.4.6 Infrastructures.....	18
3.4.7 Agricultural Credit.....	18