

**SECOND REGIONAL TRAINING COURSE ON SAMPLING METHODS FOR
PRODUCING CORE DATA ITEMS FOR AGRICULTURAL AND RURAL
STATISTICS**

Country Report - Maldives

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1.1 Introduction

The Republic of Maldives is a group of low-lying coral islands scattered vertically across the equator along the Indian Ocean archipelago. The islands are located 300 miles southwest of the southern tip of India and 450 miles west of Sri Lanka. There is an estimate of 1,192 islands separated into a series of 26 geographic atolls and has a total land of 30,000 hectares of which only 4,000 ha are arable. For easy administration these islands are grouped into 20 atolls. Out of 1,192 islands only 187 islands are inhabited islands, 105 are resort islands and 79 islands are leased by Ministry of Agriculture and Fisheries for agriculture, marine and for aqua culture. These islands grouped in ring-shape clusters stretch over an area of 90,000 sq kms of which about only 1% is land.

Over the last few decades the Maldives has transformed itself into a popular fishing, scuba diving, surfing and exotic resort and spa destination. Maldives once was described by the famous medieval Arab traveler Ibn Battuta as “One of the wonders of the world”.

1.2 The Atolls

Each of the 20 atolls is given an official name and every administrative division is identified by the Maldivian code letters, such as “Kaafu” for “Male’ Atholhu” and “K” as an atoll code letter. The atolls of Maldives are separated from each other by the expenses of the ocean. The reefs compose of coral debris and living coral, where these acts as a natural barrier against the sea. Each island has their own protective fringe of reef and openings in the surrounding reef allow access to the calmer lagoon waters. The reef protects the islands from being washed away by the ocean waves.

The speed of economic, physical and social development of Male’ and the atoll have been swift but there is a significant imbalance between Male’ and the atolls in reference to availability of facilities and population distribution. To combat this, a Regional Development program was carried forward which aimed to achieve a better balance of social, economic and physical development between atolls by focusing on promoting key areas in each region and invest the necessary social and physical infrastructure to cater for the region.

1.3 Demography and Economy

The Maldives has a total Maldivian population of 344,023 with a sex ratio of 103 males per 100 females according to the latest census 2014. The average population size in the inhabited islands is 1131 persons. However, only 20 islands have a population of over 2000 inhabitants, while 19 islands have a population of less than 350 inhabitants. Male’ being the capital consists of 38% of the total population. Tourism is the largest industry in the Maldives, accounting for 26% of GDP and more than 60% of the Maldives’ foreign exchange receipts. Fishing is the second leading sector on the Maldives.

1.4 Agriculture, fisheries and livestock sector

Agriculture in Maldives plays a minor role in the economy. The country lacks the large cultivable areas necessary for farming and has to import most of its fresh and other food, including staple foods such as rice. In fact less than 10% of the country's total land is used for farming, although the government is trying to open up some of the inhabited islands for agricultural purposes. Coconuts are the country's main crop although pumpkins, taro, mangoes, papayas, chilies, eggplants, breadfruit and watermelons are grown in limited quantities.

The Maldivian economy was entirely dependent on fisheries and other marine products for centuries and fishing and related marine activities continue to employ a significant proportion of population. The government gives priority to the development of fisheries section and about 30 percent of the country's work force is engaged in the fisheries sector. It is the second most important sector after tourism.

In the fisheries sector, the use of fishing nets is prohibited and as a result, the more labor-intensive traditional method of fishing by hook and line is practiced.

Maldives is a country without cows or buffalo. Manure is imported to be used as fertilizer. However, goats and poultry production are two growing economic activities. Goats are in demand for cultural events while eggs are popular throughout the country and especially among the resorts islands.

2 Institutional Mechanisms

2.1 Statistical system

The statistical system in the Maldives is highly decentralized, with the National Bureau of Statistics (NBS) being the core statistical unit, while other government agencies collect other kinds of data- mostly through administrative channels, but through registers to some extent and, and in fisheries area through catch and earning and other fishery related surveys and other fisheries related surveys, and agricultural data mostly through administrative records and farmers registers established at island level and other related agricultural surveys. The Ministry of Fisheries and Agriculture provides fisheries and agriculture data.

NBS is responsible for national accounts and price data, population censuses and major household surveys, and for basic enterprise surveys. One of the roles of NBS is to coordinate National Statistical System (NSS), in conjunction with the role of National Statistical Coordination Committee (NSCC).

National Statistical Coordination Committee (NSCC) consists of members from different statistical units of the line ministries. The main role of NSCC is to discuss on technical issues and give overall guidance and coordinate the statistics work.

Under the planned improvement proposed in the National Strategy for the Development of Statistics (NSDS), Ministry of Fisheries and Agriculture will investigate alternative methods for collecting agricultural production data, including backyard cultivation, conduct pilot studies for the more promising methods for complete coverage and the ministry also needs to improve its cost and earning survey of fisher folk. This will include additions to the existing questionnaire and data collection channels, as well as better enumerator training and more comprehensive data analysis.

3 Agricultural and Fisheries statistics and sampling methodologies adopted

3.1 Agricultural and Fisheries statistics

Fish constitutes the largest export commodity on the Maldives, although it is a distant second to tourism if exports of services are also considered. The Ministry of Fisheries and Agriculture (MoFA) has a Statistical Unit, which happens to be the largest statistical unit outside NBS. It is lodged in the Economic Research and Statistics Services and comprises 9 staff, in a fisheries unit (5 staff) and agriculture unit (4 staff).

Agricultural data has been collected continuously by MoFA. Fisheries data has been collected continuously since 1959 and this was extended step by step to cover the small boats.

The fisheries unit of Ministry of fisheries and Agriculture records the daily fish catch of the vessels reporting to Male'. These data are uploaded to the ministry website for the public to review and to provide an idea of the prices of the fish in the market.

The MoFA has placed a logbook system on each boat for reporting information on fish catch. There are four different logbooks, categorized as Tuna, Reef, Grouper and Long-line. These logbooks are issued to fishing boats accordingly and are expected to be filled every 15 days. Logbooks provide detailed information regarding their catch and the price of their distributions. Sometimes these logbooks data takes more than 15 days to reach due to geographical circumstances.

The MoFA has some doubts about the reliability of the daily reports to island officers, because captains are believed to be motivated to over-report in order to satisfy licensing rules that require a minimum catch and a minimum number of trips. Under-reporting due to negligence by the island officer is also a risk.

Fisheries section also conducts cost and earning surveys of fishermen in every two years. While most of the fishermen are hesitant to reveal their income, the others also increase their expenditure. It is embedded in the mentality that these surveys are conducted to either take taxes, which is influenced by income or pay subsidies, which increases when their expenditure increases.

These cost and earning surveys are conducted by ministry staffs. Sometimes consultants are hired to help prepare the questionnaires. The most recent cost and earning survey conducted by the Fisheries section was conducted in Gn. Fuvahmulah in 2015.

Most large-scale agricultural production is concentrated on few islands; but much produce is grown in backyards near Male' and may be sold directly to resorts. Agricultural data collected by island officers is limited to estimate of fallen coconuts on inhabited and uninhabited islands. Otherwise, collection of agricultural data is limited to: sales of major crops in Male' markets, in Kilograms and rufiyaa, broken down by atoll of origin. The data are maintained by Ministry of Fisheries and Agriculture.

Agriculture section is also making an attempt to prepare the logbooks to calculate the agricultural products per farmer. Four logbooks are being published, namely; crops, animals, poultry and Value added products. Expenditure and their profit can be calculated from the particular logbooks. However, this has not yet been implemented and hopefully by the starting of November the books are going to be issued.

MoFA have been facing lots of challenges in regard to both the surveys and the maintaining the log books. Firstly, the geography of the country can be challenging as travelling is costly as well as time consuming. Organizers take a lot of time to travel from one island to the other and requires huge investment if need to cover the whole country. In the meantime, the best are being done but can be improved with trained staff and more investment (including both money and time).

Currently there is no proper database maintained in both Fisheries section and agriculture section, which can produce accurate results of either the logbooks or surveys.

National Bureau of Statistics covers agricultural in Large Establishment Survey (LES), Small establishment survey (SES) and Economic Survey (ES). The main objective of the survey was to collect information on performance of different industries and their distribution to GDP. In addition, the data was used to drive weights for Producer Price Index (PPI). Data was also used to monitor the achievements of some of the national and sectorial development goals and targets set by the government.

3.2 Large Establishment Survey and Small Establishment Survey

Beginning in 1998 with the help of the ADB project, the Statistical Section carried out a Large Establishment Survey (LES) at about 500 registered enterprises, covering the years 1995-97. Conducted as a mailout, the survey was continued annually in most years until 2004. The two main problems were relatively low response rates (below 20 percent), and tardy responses so that the data were not very useful for on-time preparation of national accounts. The procedure was to send the questionnaire by mail, with follow-up reminder letters and phone calls. Some difficulties that were encountered were misplace questionnaire at some firms, many firms did not keep their accounts in a proper form and some firms were unable to provide the historical data.

A Small Establishment Survey (SES), using an area frame and covering unregistered establishment (including household ones), was carried out in 1999 and later repeated in 2001-02, both times for a one month reference period. For 1999, the frame included 2266 firms for randomly selected area of Male' and for three other islands on a complete enumeration basis. Response was much better than that for LES. The expansion of the results to represent the entire country was considered unrealizable due to small number of islands covered and the lack of control totals for the number of establishments by type for the whole country.

Unlike the previous one, SES 2001-2002 was conducted for the whole country. SES was conducted based on the structure listing, activities that cannot be limited to the fixed premise of a structure such as fishery was excluded. In case of agriculture, activities carried out by households were included.

SES was based on the area frame and the country was divided into two domains: Male' and Atolls. Further stratification in Male' was done by wards, whereas Atolls were stratified by regions. In Male' sample was drawn within each ward and in Atolls within each region. Selection of islands from region and of enumeration blocks in Male' was based on probability proportional to the number of establishments (without replacement) in islands and in blocks respectively. The frame included 2266 firms for randomly selected area of Male' and for ten other islands on a complete enumeration basis.

3.3 Economic Survey

National Bureau of Statistics conducted an Economic Survey (ES) for reference year 2007 that combines coverage of large and small establishments and utilizes field visits instead of a mailout, resulting in a sharply improved response rate. Economic Survey adopted both list base frame as well as area based frame for sampling purpose. For the list sample of 2976 establishments, response were obtained from 1533 establishment, or 51.5 percent, while 825 or 27.7 percent could not be found and 618 were either unavailable to be interviewed or refused. If the establishments that could not be found are excluded from the ratio, the response rate for listing becomes 71.2 percent. For area sample of 5170 establishments, responses were obtained from 3702 or 71.6 percent, while the remainder were either unavailable for interview or refused.

Sample frame of the Economic survey was based on 2 segments namely, list frame segment and area frame segment. The main purpose of these two approaches was to ensure that economic activities undertaken by major corporations and establishments on a large scale was captured properly. For both list frame and area frame, the country was divided into two domains: Male' and Atolls. Further stratification was done in Atolls by regions. In Male' sample was drawn within each ward and in Atolls within each region.

Within regions Atoll capital and other islands divided into two groups. It was believed that in most of the cases Atoll capital carry out more economic activities while other islands have limited economic activities.

Allocation of sample in domains was based on proportional to the number of self-employed. The sample design used was two-stage sampling with enumeration blocks as primary sampling units (psu) (probability proportional to size, without replacement) and all eligible household unit and establishments (excluding the establishments already in the list segment sample) in the sample area as secondary or ultimate sampling unit (usu).

The basis of the list frame segment was the “Noonu form” of the Population and Housing Census 2006. However, this list was “updated” using a list of establishments received for the island offices after checking for duplicate entries. The establishments were grouped by ISIC major category level. After tabulating the establishments by ISIC category, these were divided in to two categories, “take all” segment and “non-take all” segment. These segments are made depending on the number of establishments in each ISIC group. If the establishment number is greater than 30 in the ISIC group then it was decided to go for sampling without replacement (srswor). All 41 islands except 5 islands were classified under the “take all” category. Hence, the list prepared from “Noonu form” was fully utilized in the enumeration process. In the “non-take all” category islands, only ISIC 5211 needed sampling and all other ISIC groups was enumerated fully.

In the List based segment the sample consists of 2,976 establishments (without replacement), i.e. 1,823 establishments in Male’ and 1,153 establishments in Atolls. However due to different reasons only 705 establishments participated in the survey in Male’ and 828 establishments in Atolls.

In the case of area based segment, 2,629 establishments in Male’ and 2,541 establishment in Atolls were selected for the sample. Out of which 1,649 establishment in Male’ participate in the survey and 2,053 establishments in Atolls responded to the survey.

Economic survey 2012/2013 was the second survey of its kind designed to integrate all economic activities of the Republic of Maldives. The survey covers large, medium and small enterprises carrying out various economic activities. However, informal economic activities varied out by the household sector was out of the scope.

Two-stage stratification was done for ES 2012/2013. In the initial stage, the islands for enumeration in the survey were selected based on the population. All the islands with a population of 2,500 and above, based on Census 2006, were selected for enumeration in the survey. Data collection was done in all six wards of Male’, six islands of Addu City and additional 9 more islands. The second stage of stratification was for Male’ and Addu City only, based on the economic activity carried out and the number of employees. Sectors Electricity, gas, steam and air conditioning supply, Water supply; sewerage, waste management and remediation activities and Financial and insurance activities were census sectors for Male’ and Addu City. All the establishments with employees 20 and above were auto-selected for enumeration. The resorts are an exception to this rule where a sample of 80 resorts was selected out of the 100 operational resorts in 2011.

The survey covered over 6,143 establishments, of which 4,507 establishments were in Male’, 386 establishments in Addu City, 100 resorts and 1,149 establishments in the other islands enumerated. Approximately 52 percent of the establishments enumerated were engaged in retail trade activities.

4 Questions on specific issues regarding application of sampling methods

1. How to combine the results to the national level if both area and list based frame is used when selecting the sample?
2. On what basis do we select islands for a survey which would result in an estimate of the whole country?
3. What is the best sampling method to obtain weekly agricultural produce of a country with geography similar to Maldives?
4. Being disperse and no proper registration system neither business registration, what are the alternative ways to capture the enterprises/ establishment data?