

Country Report of Cambodia

The National Census of Agriculture in Cambodia (NCAC), conducted in 2013, was a comprehensive statistical undertaking for the collection and compilation of information on crop cultivation, raising livestock and poultry, and aquaculture operations. The data collected and generated from this census will be useful in the formulation of plans, policies and programs for the development and improvement of the agriculture and fisheries sectors in the Royal Government of Cambodia (RGC). This was the first census of agriculture conducted in the Kingdom of Cambodia.

The National Institute of Statistics (NIS) of the Ministry of Planning, and the Ministry of Agriculture, Forestry and Fisheries (MAFF), were the responsible government ministries authorized to undertake the NCAC 2013. While the NIS had the census mandate, the MAFF will be the primary user of the data produced from the census.

Objective

The main objective of the NCAC 2013 was to provide data on the temporal agricultural situation in the Kingdom of Cambodia to be utilized by planners and policy-makers. Specifically, the census data will be useful in:

1. Providing a sampling frame in the conduct of agricultural surveys;
2. Providing data at the smallest administrative unit in the country; and,
3. Providing data on the current structure of the country's agricultural holdings, including cropping, raising livestock and poultry, and aquaculture activities.

Approach

The broad approach for the NCAC was to identify and approach all households in all provinces in Cambodia with the exception of the urban area of Phnom Penh. Census enumerators were mobilized in all provinces and trained for this massive undertaking. Of 2.6 million households in the census target area, 2.1 million household agricultural holdings were identified according to the pre-requisite conditions for a minimum cropping area of 0.03 ha and/or having at least 2 large livestock and/or three head of small livestock and/or a minimum of 25 poultry. Those 2.1 million households were identified as having 5.66 million parcels of land within their holdings and a total area of 3.3 million hectares of land. These households provided basic information on the household, the nature of their holdings and their agricultural activities to provide a very complete data set for selected key questions. In order to expand the data set and cover a much more detailed set of questions, a survey approach was used with a Probability Proportional to Size sampling to gather data on all relevant household agricultural activities and conditions.

The information set was further expanded with a questionnaire for village heads and

follow up questions for all of the juridical holdings encountered in the census. Because the census was directed at the household sector, only a limited number of juridical holdings were encountered in the process. Information on the juridical holdings should not be considered as comprehensive given the limited scope for their inclusion in the information gathering process. The agricultural census was primarily a task of complete enumeration of all households in the country and household agricultural holdings in particular. The households resident in urban Phnom Penh were excluded from the census area.

Once households were identified as qualifying for inclusion in the census as having agricultural holdings, their land holdings were assessed in terms of whether the holdings consisted of a homelot with separate agricultural lands or only a homelot and the production activities were assessed for these different types of holdings. For the survey questions, the target population was restricted to the holdings that included separate agricultural lands and also those households with only a homelot with agricultural activities within were included in the sample frame. These amounted to 1.88 million households with some 5.4 million parcels of land within their holdings, and an area of 3.3 million ha.

Census Scope

The NCAC 2013 utilized six questionnaires for the census and survey in the household sector. Two questionnaires (Forms A & B) were used in the core module phase and canvassed on census basis, aiming to cover every household outside the urban districts of Phnom Penh. The other four questionnaires (Forms C, D, E & F) were used in the supplementary module phase and detailed data were collected on a sample basis. One questionnaire (Form G) was administered to the village leaders to collect information on topographical features, calamities or disasters, availability of economic activities, etc. along with availability of village level infrastructure. Separate forms were used to collect data for the non-household agricultural holdings. The questionnaires are available on the website for the NIS.

The NCAC 2013 utilized six main questionnaires for the census and survey of the household sector. Two questionnaires (Forms A & B) were used in the core module phase and were canvassed on a census basis, aiming to cover every household outside the urban districts of Phnom Penh. The other four questionnaires (Forms C, D, E & F) were used in the supplementary module phase to collect detailed data on a sample basis. One questionnaire (Form G) was administered to village leaders to collect information on topographical features, calamities or disasters, availability of economic activities, etc.,

along with availability of village level infrastructure. Separate forms were used to collect data for the non-household agricultural holdings. The questionnaires are available on the website for the NIS.

The scope of each questionnaire was as follows:

Form A – Listing Form: Collected information on the location and involvement of households in agriculture or aquaculture activities. This form was used to identify households qualifying for inclusion in the census by having a land holding used for agricultural purposes.

Form B – Basic Information on the Agricultural Holding: Collected information on the location, the respondent and the agricultural holding. Information included the legal status of the agricultural holding, basic characteristics of the holding such as size, number of parcels in the holding and location, actual area, main land use, land tenure of each parcel in the holding, presence of forest and other wooded lands, use of irrigation, temporary crops planted, permanent crops planted, main purpose of production, livestock and poultry raised in the holding, presence of aquaculture and the landholder's household information.

Form C – Growing of Crops: Collected information on the location, respondent and agriculture holders as well as sub-holders; temporary crops planted and harvested, including area planted, cropping duration, cropping pattern, and area harvested; permanent crops, including area of compact plantations and number of productive permanent crops in scattered planting, irrigation and other information regarding parcels and agricultural activities in the homelot; agricultural practices, implements, equipment and machinery used in the holding; agricultural services, membership in an organization and other relevant information.

Form D – Raising Livestock and Poultry: Collected information on the location, respondent, the agricultural landholder and sub-holders; livestock and poultry raised as of the time of enumeration; inventory of livestock and poultry during the previous 12 months; equipment, machinery, buildings and access to agricultural extension services.

Form E – Aquaculture Activity: Collected information on the location, respondent and aquaculture operator and sub-operators; details of aquaculture activity, including types of culture, location, actual area, production facilities, types of water used, main species cultured and equipment and machinery used; household involvement, hired labor and other relevant information.

Form F – Relevant Information on the Agricultural Household: Collected information on the location, respondent and agricultural landholder; agricultural household population:

total number, name, relation to head, sex, age, marital status, highest school grade completed, currently attending school, physical/psychological/mental difficulty; primary and secondary economic activity, status of employment and tasks done in own agricultural holding in previous 12 months; other farm labour, food security, other economic activities such as catching fish and aquatic products in marine or inland waters, forestry-related activities, etc.

Form G – Village Questionnaire: Collected information on soil types, main topographical features, susceptibility to calamity or disaster within the previous five years, economic activities available, seasonal labour movement, crop duration, presence of agro-processing equipment, machinery and facilities, mode of transport, availability of schools, communication facilities, health facilities, water facilities, access to roads and presence of markets, presence of people's organizations, presence of NGO/INGO, ethnicities and religion.

All households in the country were interviewed in the first phase using Form A to determine their involvement in agricultural holdings. In the case where a household was found to be involved in agricultural activities and qualified for inclusion, according to the definition of an agricultural holding, the household was further interviewed using Form B. Detailed data in respect of agricultural holdings were collected using appropriate Forms F and C and/or D and/or E during the supplementary module phase from a sample of households, which were selected using probability sampling methods.

Geographical Coverage

All households in the country, excepting four districts of Phnom Penh that were known to be core urban areas, were covered in the NCAC 2013, along with large agricultural enterprises operated by corporations, cooperatives, government and private institutions – termed 'juridical holdings' – in the non-household sector.

Agricultural holdings owned, managed and operated by urban households or entities not encountered in the census coverage area were thus kept outside the purview of survey coverage. Smaller agricultural enterprises engaged in farming in the non-household sector could not be covered in the survey, as their inclusion in the survey was not considered economical. Villages with a very small number of agricultural households (five or less) were also excluded from the sampling frame for the supplementary modules.

Survey and Reference Period

The NCAC 2013 was undertaken in two phases: A core module – to list all households in all villages in the country – was undertaken during 45 days from 17 April 2013 to 31 May 2013. The supplementary module was conducted during the period November 1-22, 2013. There was a slight extension of the survey period in the supplementary phase due to heavy

rain and problems of access for the survey teams, particularly in hilly areas.

The 12-month period prior to 1 April 2013 (i.e. from 1 April 2012 to 31 March 2013) was, in general, used as the reference period for Form A and Form B. For most of the items of Forms C, D, E and F, the reference period was the 12 months immediately preceding the surveys conducted in November 2013. However, the reference period for some of the items was different from the time period specified, and is thus indicated separately for data items in each questionnaire.

Sampling

In the core module, the listing and collection of some basic information about agricultural and aquaculture activities was conducted in respect of all households of all villages in the country. In the supplementary module, the survey was carried out both in the household and non-household sectors. These statistical units were categorized as agricultural households in the household sector, and large agricultural entities operated by corporations, cooperatives, government and private institutions in the non-household sector.

The list of villages compiled for the Population Census (PC) 2008 was used as the basic document for the listing work of the NCAC 2013 in the core module phase. Then, the list of agricultural households prepared from the data collected in Form B, in the core module phase, was used as the sampling frame in the supplementary phase. 'Large' agricultural households were identified at this stage from the list. In addition, a list of 'special' agricultural holdings and 'juridical' agricultural holdings was prepared at the administrative level, and this list was used to include the 'large' agricultural holdings identified in the survey.

Survey Procedure

All data in the NCAC 2013 were collected in de facto method by a group of trained enumerators and supervisors directly interviewing eligible members of farming households.

The respondents were any adult family member (18 years or older) of the household and knowledgeable of the agricultural holding's activities. The most qualified respondent was the agriculture holder. However, in his or her absence, the spouse or any son or daughter 18 years or older, could also act as the respondent. No household member below 18 years or neighbour or other household was interviewed or asked for the information on the household being surveyed.

Data in the census and survey were collected using standardised structured questionnaires

guided by the *Instruction Manual for Field Staff*, which provided detailed concepts, definitions and procedures to be followed for collection of each item. The draft questionnaires and instructions manual were prepared on the basis of recommendations from the User-Producers Workshop. The census questionnaires and enumeration manuals were revised and finalised based on the results of a pilot census and experiences gained during that exercise. The *Instruction Manual for Field Staff* was supplemented by a set of checks on the consistency of data carried out in the field, at the data entry stage, and in the subsequent data validation processes.

Sample Design and Field Operations

In general, a stratified two-stage sampling design was adopted for the survey. The First Stage Units (FSU) were villages within a commune. The Second Stage Units (SSU) were households with small agricultural holding within the sample villages. The FSUs were selected within each commune by systematic Probability Proportional to Size – size being the number of households with agricultural holdings. The SSUs were selected systematically with a random starting point. The first stage of sample selection was conducted at the commune level using a sampling rate of 50 percent in order to produce statistics at this level. Households with small agricultural holdings were selected with a sampling rate of 5 percent, that is, for every 20 households with small agricultural holdings, one was chosen as a sample household (see details of sampling design and estimation procedures in Annex 1). All data in the core module of the NCAC 2013 were collected from over 2.1 million households spread over 14 073 villages, 1 633 communes, 143 districts and 24 provinces by trained enumerators who were selected from among university students and graduates, and Village Animal Health Workers on the basis of qualifying tests.

Field operations included training of supervisors and enumerators, data collection and supervision. Central and field staff from the NIS and MAFF, and the 4,000 hired field data workers, were trained before they undertook the data collection and supervision process. Since the NCAC was composed of two modules, separate training was conducted for each module. There were two levels of training, conducted separately, in both the core module and supplementary module. The two levels of training for each module were: (a) training of trainers, which included NIS and MAFF central office staff, provincial heads and representatives; and (b) training of enumerators and team supervisors. All field officials including supervisors at all levels were trained extensively in concepts, definitions and procedures for data collection.

Rice Crop Cutting in Cambodia

1- Introduction

Cambodia has a big potential in paddy rice production to increase its milled rice export. To guide its vision for the preparation of economic development policy, the RGC has an ambition to turn Cambodia into a key «rice- white gold» exporting country in the international market. Paddy rice production slightly increased reach 9.3 million tons in 2010-2014, after a remarkable rebound over the past five years. With the estimated domestic consumption of approximately 2.18 million tons of paddy rice, the provision for seeds and taking into account the harvest loss, the statistics shows a surplus of 3 million which can be processed into milled rice for export. But, so far, the official statistics in 2014 recorded only 387,000 tons of milled rice or 605,000 tons of paddy rice export, although Cambodia has actually exported much more milled rice.

2- Experience of Crop Cutting

Cambodia conduct crop cutting sample survey on rice covered for 25 provinces in the country. Rice crop cutting survey based on the statistical random sampling survey is a survey technique to estimate the yield of rice by the provincial level and national level. This survey method is applied to estimate the yield per ha accurately. The method is the most reliable to estimate yield of the rice crop.

3- Crop cutting survey preparing

Crop Cutting Survey is the main methods that use for estimate yield per hectare. Before conduct crop cutting, we should prepare the list Frame (Villages list) and materials for the survey.

3.1 List Frame

List frame took from the population census taken by National Institute of Statistics (NIS) of Ministry of Planning. List frame have been updated for the rice producing villages and total number of rice growing households in the village. The enumerator interviews the leader of village and lists name of farmers who have paddy field in that period then interview them about planted area, harvested area and production. Therefore, yield data is obtained from the result of the dividing of the total production by the total harvested area.

	A	B	C	D	E	F	G
1	Vil_Code	Province	District	Commune	Villages	EA-No	No-HH
2	01020101	Banteay Meanchey	Mongkol Borei	Banteay Neang	Ou Thum	2	162
3	01020102	Banteay Meanchey	Mongkol Borei	Banteay Neang	Phnum	2	215
4	01020103	Banteay Meanchey	Mongkol Borei	Banteay Neang	Banteay Neang	4	383
5	01020104	Banteay Meanchey	Mongkol Borei	Banteay Neang	Kouk Pnov	2	172
6	01020105	Banteay Meanchey	Mongkol Borei	Banteay Neang	Trang	2	131
7	01020106	Banteay Meanchey	Mongkol Borei	Banteay Neang	Pongro	3	215
8	01020107	Banteay Meanchey	Mongkol Borei	Banteay Neang	Kouk Tonloab	2	224
9	01020108	Banteay Meanchey	Mongkol Borei	Banteay Neang	Trabaek	1	100
10	01020109	Banteay Meanchey	Mongkol Borei	Banteay Neang	Khile	2	212
11	01020110	Banteay Meanchey	Mongkol Borei	Banteay Neang	Samraong Pen	2	127
12	01020111	Banteay Meanchey	Mongkol Borei	Banteay Neang	Dang Run Lech	2	187
13	01020112	Banteay Meanchey	Mongkol Borei	Banteay Neang	Dang Run Kaeut	2	156
14	01020113	Banteay Meanchey	Mongkol Borei	Banteay Neang	Ou Snguot	2	229
15	01020114	Banteay Meanchey	Mongkol Borei	Banteay Neang	Prey Changha Lech	2	198
16	01020115	Banteay Meanchey	Mongkol Borei	Banteay Neang	Prey Changha Kaeut	1	89
17	01020116	Banteay Meanchey	Mongkol Borei	Banteay Neang	Ou Andoung Lech	1	98
18	01020117	Banteay Meanchey	Mongkol Borei	Banteay Neang	Ou Andoung Kandal	2	148
19	01020118	Banteay Meanchey	Mongkol Borei	Banteay Neang	Ou Andoung Kaeut	4	361
20	01020119	Banteay Meanchey	Mongkol Borei	Banteay Neang	Kouk Kduoch	2	161
21	01020201	Banteay Meanchey	Mongkol Borei	Bat Trang	Khtum Reay Lech	1	29
22	01020202	Banteay Meanchey	Mongkol Borei	Bat Trang	Khtum Reay Kaeut	1	150
23	01020203	Banteay Meanchey	Mongkol Borei	Bat Trang	Anlong Thngan Kaeut	2	196

3.2 Material

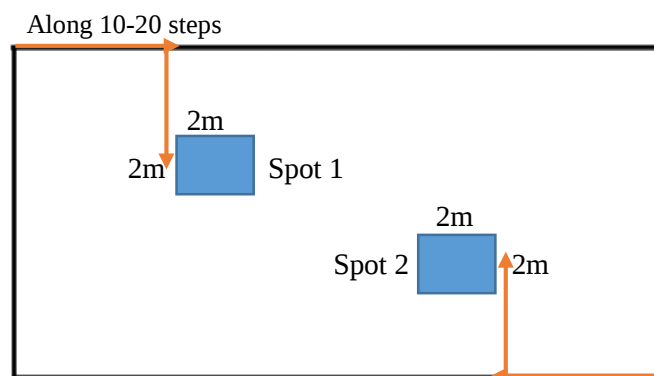
Material for conducting crop cutting survey (Rice) are: digital scales, cutter, winnowing, 4 bamboo or pipe sticks length 2m, meter tap, plastic mat, Casio, Sack and Moisture measures.

4- Sampling

The sampling method for crop cutting survey is two stage sampling:

- 1). Selecting sample villages from the list of planted paddy villages as a primary sampling unit in each district of the province.
- 2). Select sample households producing rice from the list in the sample village has been selected as a secondary sampling unit. In each sample village select three household samples that get from list frame procedure by randomization and interview them about a number of sample fields, area of sample field, variety, planting or harvesting period, technology application, yield of production in this year and last year.

In a sample household select 2 survey field for crop cutting and one survey field select 2 sample spots by using 10-20 steps method (depend on the field size). We choose spot 1 by taking 10-20 steps across the row from the left corner at the bottom of the field then turn right and walk 10-20 steps into the field and choose spot 2 by taking 10-20 steps the row from the right corner at the top of the field then turn right and walk 30 paces into the field.



5- Crop Cutting

Conduct crop cutting with size of sample pot normal attention using 2m x 2m at each spot. Harvest crop inside area of sample spot.



6- Threshing

After harvesting from sample spot, we need to check carefully on grain not yet ripe or fruitless to be remove by using winnowing or other devices. Then be prepared to bag sample grain carefully avoid any fall post-harvest losses.





7- Weighing wet sample rice

Measure the weight of the raw/wet sample rice on 1000g (1kg) digital balance after completely cleaning. If the sample rice has more than 1kg, we should be measure in to two times.



8- Moisture Measuring

Grain moisture measurement was carried out after the weigh grain samples rice from survey field. Please note that we can keep rice after cleaning and drying to dry up moisture levels 14% only. Rice moisture contain after harvested immediately no more than 20%-24% of moisture.



9- Yield Calculation

Calculate the primary yield data in order to transform the weight of paddy in 4-sq meter to be the weight in 1ha by multiplying with 2,500. Yield could be calculating with 14% of moisture contain, we can calculate the following formula:

$$\text{Weight}_{14\%} = \frac{\text{Weight}_{20\%} \times (100 - 20)}{(100 - 14)} \quad (\text{Unit: gm})$$

$$\text{Weight}_{14\%} = \text{Weight}_{20\%} \times 0.93$$

A sample spot size is 2m x 2m = 4m², if we calculate in one hectare is 2500 sample spots. We conduct crop cutting within sample field which is excluded dyke area. In case of paddy crop cutting, we set up the 4m² frame on the rice field where rice is cultivated. Then, we cut them, weigh and estimate the yield.

Yield calculate per hectare from the grain with moisture contain 20% to 14%

No	Grain Weight (gm)	Yield (Ton/ha) 14% of moisture contain
6	900	2.09
7	1000	2.33
8	1100	2.56
9	1200	2.79
10	1300	3.02
11	1400	3.26
12	1500	3.49
13	1600	3.72
14	1700	3.95
15	1800	4.19

