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Country Presentation

Lao Census of Agriculture 2010/11

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I. Background

The Government of Lao PDR has long recognized that good statistics are needed to effectively monitor the progress of development of the agricultural sector and for good planning and policy-making. The Government has identified the agricultural census as one of its highest priorities. The census would provide reliable and up-to-date structural data on the agricultural sector that would enable the implementation of more effective agricultural and rural development policies and programmes.

The decision to conduct the Lao Census of Agriculture 2010/11 was decreed by the Prime Minister in 2009. This was the second agricultural census undertaken in Lao PDR – the first was conducted in 1998/99. The Lao Census of Agriculture 2010/11 was undertaken under the overall control of the Agricultural Census Steering Committee, chaired by Mr Somsavat Lengsavad, Deputy Prime Minister. The work on the census was undertaken by the Agricultural Census Office (ACO), which was established in the Department of Planning (DoP) of the Ministry of Agriculture and Forestry (MAF). The Department of Statistics (DoS) of the Ministry of Planning and Investment provided technical assistance with this work.

Financial support for the census was received from a number of donors, including SDC, IFAD, AusAID, AFD and GIZ. The Government of Lao PDR also contributed its own funds. FAO provided technical support for the census.

II. Purpose of the Lao Census of Agriculture 2010/11

The census had four main aims:

- to provide data on the organizational structure of agriculture, especially for small administrative units (such as districts and villages) and other detailed cross-tabulations;
- to provide data to use as benchmarks for current agricultural statistics;
- to provide frames for agricultural sample surveys;
- to provide data on infrastructure and agricultural services at the village level.

III. Implementation of the census

3.1. Scope of the census

The Lao Census of Agriculture 2010/11 covered the whole of Lao PDR, including all 143 districts in the country. Both urban and rural areas were covered, including urban areas in Vientiane. The census covered agricultural activities of private households carried out on their own or in partnership with other households. People living in accommodation units, such as hostels, were excluded. It was planned to include an institutional component covering agricultural activities undertaken by government organizations, businesses, etc. This was postponed because of technical complexities in frame creation.

3.2. Statistical unit

The main statistical unit for the census was the farm household. A farm household is a household engaged in agricultural or aquacultural production activities. Minimum size criteria were applied in the definition of farm household; namely that the household: operated 0.02 ha or more agricultural land; or raised 2 or

more cattle or buffaloes; or raised 5 or more pigs, goats or sheep; or raised 20 or more poultry. In the Lao context, the farm household corresponds almost exactly with FAO's agricultural holding concept.

3.3. Census components

The census was developed based on the guidelines given in *A system of integrated agricultural censuses and surveys; Volume 1: World Programme for the Census of Agriculture 2010* (FAO 2005). The modular approach recommended by FAO was incorporated into the census design. Also, community-level data were included.

The census had three components:

- Village component: a survey of all villages in the country to collect data from village heads on rural infrastructure and services.
- Household component: a survey of all households in Lao PDR to collect basic data on crops and livestock.
- Sample farm household component: a sample survey of 41,660 farm households to collect detailed data on agricultural production activities.

3.4. Topics covered

The census was developed based on FAO guidelines, taking into account the circumstances in Lao PDR.

The main topics covered were:

- Village component: presence of electricity, irrigation facilities, credit facilities, schools, health facilities, agricultural market, public services and community facilities; transport links; sale of agricultural produce; shifting cultivation practices; sources of drinking water; UXO affected agricultural land; resettlement; soil degradation; weather patterns; natural disasters; and changes in living standards.
- Household component: identification of farm households; area of agricultural land; area irrigated; area of each temporary crop by season; area of productive and non-productive permanent crops; livestock numbers by type; purpose of agricultural production; sale of agricultural production; ownership of tractor and water pump; aquaculture and capture fisheries; household size; sex, age and ethnic group of household head; presence of forest land; and main source of income.
- Sample farm household component: farm size; land tenure; land fragmentation; land use; shifting and rotating cultivation; use of crop inputs; age, sex and purpose of livestock by type; vaccination; use of credit; agricultural marketing; certified agricultural produce; farm population by age and sex; employment of farm population; farm management; forestry activities; and types of fishing activities.

The content of the census was more comprehensive than in 1998/99 with a wider range of gender-related data, more data on fisheries, and improvements in the employment data. Attention was given to ensuring that the statistical concepts used were consistent with international standards.

3.5. Sample design and selection

The sample farm household component was designed using two-stage sampling: a sample of villages was first selected, and then a sample of farm households was selected in each sample village. This was slightly different from the approach used in the 1998/99 census in that *farm households* were sampled in 2010/11 at the second stage rather than *households* as in 1998/99. This resulted in improved sampling errors.

In most districts, a sample of between 16 and 22 villages was selected, with 16 farm households selected in each sample village; that is, a sample of between 256 and 352 sample farm households in each district. The more villages or farm households there were in a district, the bigger was the sample taken. A smaller sample was taken in urban districts and districts containing few villages or households.

In each district, the sample of villages was selected using stratified systematic probability proportional to size (PPS) sampling. A list of all villages in Lao PDR was prepared. Villages were divided into urban and rural strata, with rural strata being sampled more heavily than urban strata because of their agricultural importance. The estimated number of households in each village was used as the size measure for PPS sampling.

The sample of farm households in each sample village was selected using stratified systematic random sampling based on a list of all farm households in each village prepared following the household component of the census.

Altogether, 2,620 villages and 41,660 sample farm households were selected in the sample. The sample sizes for each province are shown in Table 1.

Table 1 : Lao Census of Agriculture 2010/11, sample size by province

Province	Districts	Villages	Sample villages	Sample farm h'holds
Phongsaly	7	541	131	2,094
Luangnamtha	5	356	93	1,488
Oudomxay	7	471	135	2,159
Bokeo	5	283	93	1,488
Luangprabang	12	783	219	3,491
Huaphanh	8	721	155	2,479
Xayabury	11	446	189	3,024
Vientiane Cap.	9	490	136	2,062
Xiengkhuang	8	512	148	2,332
Vientiane Prov.	13	506	231	3,728
Borikhamxay	7	323	124	1,984
Khammuane	9	587	168	2,683
Savannakhet	15	1,012	289	4,566
Saravane	8	605	159	2,544
Sekong	4	233	71	1,133
Champasack	10	643	191	2,997
Attapeu	5	150	88	1,408
TOTAL	143	8,662	2,620	41,660

3.6. Census field organization

There were four levels of census field organization.

- Central coordinators, recruited from MAF, DoS and other central agencies in Vientiane, had overall responsibility for the census enumeration in a province. There were one or two central coordinators in each province. ACO provided a two-week training course for central coordinators.
- Provincial coordinators, one from each of the provincial MAF and DoS offices, were appointed to assist the central coordinators. Provincial coordinators were trained at the same time as the central coordinators.
- District supervisors were appointed to work under the control of the central and provincial coordinators to supervise the enumeration work. There were 312 district supervisors: two in most districts and three or four in larger districts. District supervisors were district-level staff from MAF and DoS. District supervisors were trained in a two-week training course given by the central/provincial coordinators.
- In all 2,333 enumerators were recruited to collect the census data. The enumerators were

government staff from districts, as well as teachers, students, police officers and military personnel. Enumerators received five days of training provided by the district supervisors.

3.7. Census enumeration

The list of villages was prepared based on information updated from the Population and Housing Census 2005. This list was sent to provinces and districts to identify villages for the census enumeration.

The census data collection was undertaken from 28 February to 8 April 2011. The enumerator's task in each village was to:

- interview the village head to enumerate the village component;
- list all private households currently living in the village based on village registers and information provided by village heads;
- interview each private household in the village to enumerate the household component;
- prepare a list of farm households in the village, based on responses to the household component;
- (sample villages only) select a sample of farm households for enumeration in the sample farm household component, and interview sample households to collect the required data.

IV. Data processing of the census.

Completed questionnaires were returned to ACO in Vientiane for processing. Processing involved: checking that the census enumeration was complete; manually checking that questionnaires had been correctly filled out; coding of descriptive responses (such as crop types); entering data into the computer (using keyboard methods); running computer checks to identify and correct errors; and producing tabulations of census data.

There were nearly 1.2 million questionnaires and therefore it took some for the processing to be completed. Preliminary checking and coding was done from May-September 2011; data entry was done from June-December 2011; and error checking was done from August 2011-February 2012. Tabulations were prepared by April 2012.

A census report was prepared presenting key tables, as well as the results of preliminary analysis of the census data and an outline of the census methodology. The report was officially released in June 2012.

V. Results of the census

Many census output tables have been prepared at the national, district and village levels. Some key results are shown in Appendix 1.

VI. Future plan for dissemination and analysis of the Lao Census of Agriculture 2010/11

With the census results now available, attention has now turned towards dissemination and analysis of the census results. The following activities are planned for the next twelve months:

- Additional dissemination materials. Further census tables will be prepared for dissemination in printed or electronic form. A computer system is being developed to provide interactive facilities to help users access the data.
- Dissemination workshops. Dissemination workshops will be held at the central level and in each province to promote the use of the census data. The workshops are directed at: (i) senior officers, to raise awareness of how to use census data for evidence-based policy and planning work; and (ii) agricultural policy/planning/research technicians, to explain how to analyze the census results.

- Census analysis studies. There is enormous scope for research and analysis of agricultural census data. Several priority studies have been identified, focusing on areas of special concern to MAF in line with Government priorities for the development of the agricultural sector. These include gender, land use, environmental sustainability, and studies of particular crop and livestock industries. An *Agricultural Atlas* will also be prepared, based on work on the updating of village GPS coordinates carried out in coordination with the census.
- Other post-census activities. Three other post-census activities will be carried out: preparation of a sampling frame from the agricultural census for use in conducting future agricultural surveys, improving the agricultural statistics system, and developing an integrated agricultural statistics database system.

VII. Constraints and lessons learnt

The main constraints in conducting the census were:

- Because of funding issues, only six months were available for the development of the census.
- There were difficulties in planning and implementing the data collection because of delays in receiving funds. Also, there were funding shortages, especially for data collection.
- Transportation is difficult in some areas with the need to travel by boat or on foot in inaccessible areas.
- There were weaknesses in staff understanding of data collection and data processing in censuses or surveys.

The main lessons learnt were:

- The Steering Committees were effective in providing overall direction to the census and in helping to organize and coordinate census data collection.
- Staff of DoP and DoS worked together in the same office during the census development and processing and this helped to provide coordination and cooperation in the census implementation.
- It is important for sufficient time to be allowed for questionnaire design, field testing, preparation of field manuals and other census development activities. In future, at least twelve months should be set aside for this work.
- In planning future censuses, funding issues should be resolved well in advance of the census so that preparations for the census enumeration are not delayed.
- Skills and experience that staff had acquired through working on the previous agricultural census were very useful in the current census.
- Attention should be given to ensuring that decision-makers use the census for planning and policy-making.

Department of Planning
Ministry of Agriculture and Forestry
Lao PDR

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Appendix:1 Some Results of the Lao Census of Agriculture 2010/11
Table 1: Number of farm households by province, 1998/99 and 2010/11

Province	No. of farm h'holds ('000)		Change (%)
	1998/99	2010/11	
North	238.4	288.9	21%
Phongsaly	24.4	28.4	16%
Luangnamtha	19.8	26.2	33%
Oudomxay	33.4	44.6	34%
Bokeo	18.8	24.8	31%
Luangprabang	55.7	59.5	7%
Huaphanh	36.9	42.3	14%
Xavabury	49.4	63.1	28%
Centre	293.5	336.4	15%
Vientiane Capital	48.6	42.8	-12%
Xiengkhuang	28.1	36.2	29%
Vientiane Province	43.7	62.7	44%
Borikhamxay	26.5	35.0	32%
Khammuane	43.6	51.1	17%
Savannakhet	95.4	108.6	14%
Xaysomboon SR	7.6
South	136.0	157.5	16%
Saravane	41.3	50.1	21%
Sekong	9.7	12.9	32%
Champasack	70.2	75.4	7%
Attapeu	14.8	19.1	29%
Lao PDR	668.0	782.8	17%

Table 2: Temporary crops other than rice, 1998/99 and 2010/11

Crop type	No. of growers		Area ¹ (ha)	
	1998/99	2010/11	1998/99	2010/11
Maize	149,900	187,300	25,500	134,500
Sweet potato	19,600	10,200	200	700
Cassava	71,000	47,900	7,400	18,900
Yam	8,900	3,800	200	300
Mung bean	3,100	2,600	700	600
Sugar cane	22,400	13,000	3,100	6,400
Groundnut	21,400	28,500	4,900	8,300
Soybean	4,800	6,900	800	1,900
Sesame	19,000	25,700	600	9,900
Cotton	9,300	1,100	2,500	100
Tobacco	18,400	14,800	2,700	3,400
Chinese cabbage	88,200	105,900	2,100	1,700
Watermelon	11,000	7,500	1,800	2,000
Chili	127,500	126,200	2,100	2,600

1. Area excludes crops planted in plots of less than 100 sm.

Table 3. Comparison of 1998/99 and 2010/11 Census Results

Farm household characteristics	1998/99	2010/11
<i>Farm households</i>		
No. of households ('000)	798	1,021
No. of farm households ('000)	668	783
Farm households as percent of all households	84	77
Rural households as percent of all households	..	
Farm population ('000)	4,058	
Average household size	6.1	
<i>Area of land holdings</i>		
Area of agricultural land ('000 ha)	976	
Average area of holding (ha)	1.6	
Farm households by area of holding (%)		
□□□□ Less than 1 ha	36	
□□□□ 1-2 ha	36	
□□□□ 2 ha and over	27	
Average parcel size (ha)	0.77	
<i>Area of agricultural land by main use ('000 ha)</i>		
Temporary crops	765	
Left fallow	112	
Permanent crops	81	
Grazing land	18	
<i>Land tenure</i>		
Land tenure (% of land area)		
□□□□ Owned	97	
□□□□ Other	3	
<i>Rice cultivation</i>		
Rice area planted by season ('000 ha)		
□□□□ Wet season lowland	481	
□□□□ Wet season upland	199	
□□□□ Dry season	56	
Rice growers by season ('000)		
□□□□ Wet season lowland	419	
□□□□ Wet season upland	260	
□□□□ Dry season	93	
Glutinous rice (% of rice area)	93	
Improved varieties (% of growers)	30	

No. of farm households growing other crops ('000)		
Vegetables	233	
Cassava	71	
Sugar cane	22	
No. of farm households with permanent crops ('000)		
Mango	152	188
Banana	109	
Rubber	-	

Table 3 (cont.). Comparison of 1998/99 and 2010/11 Census Results

Farm household characteristics	1998/99	2010/11
<i>Use of inputs (% of temporary crop growers)</i>		
Chemical fertilizers		
Organic fertilizers		
Pesticides		
<i>Livestock and poultry ('000 of animals)</i>		
Cattle		1,586
Buffaloes		
Pigs		978
Local chickens		
Ducks		1,791
<i>Number of farm households with livestock ('000)</i>		
Cattle		
Buffaloes		
Pigs		
Local chickens		
Ducks	191	213
<i>Average animals per livestock holding</i>		
Cattle		
Buffaloes		
Pigs		
Local chickens		
Ducks	7.1	8.4
<i>Use of vaccination (% of livestock holdings)</i>		
Cattle		
Buffaloes		
Pigs		
<i>Farm machinery (% of farm households)</i>		
Owned two-wheel tractor		
Used two-wheel tractor		
Owned water pump		
Used water pump		
<i>Number of farm households engaged in fisheries</i>		

Aquaculture		
Capture fisheries		
<i>Farm labour</i>		
Farm occupations (% employed persons 15 & over)	92	
Main occupation on holding but also did work off holding (% 15 & over with main occupation on holding)	24	40
Farm households using outside labour (%)		
<i>Sale of farm produce (% of farm households)</i>		
Main purpose for sale		
Sold some produce		

References:

World Programme for the Census of Agriculture 2010, FAO 2005

Lao Census of Agriculture 2010/11 Highlights, MAF 2012