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IMPROVEMENT OF AGRICULTURAL STATISTICS
IN ASIA AND PACIFIC COUNTRIES
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**General Status of the System
of Food and Agriculture Statistics
in LAO PDR**

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GENERAL STATUS OF THE SYSTEM OF FOOD AND AGRICULTURE STATISTICS IN LAO PDR

1. Organizations concerned with agriculture and agricultural statistics

The Lao People's Democratic Republic, or Lao PDR for short, has a decentralized statistical system. The National Statistical Centre (NSC) under the State Committee for Planning and Cooperation coordinates national statistical activities among governmental organizations and is responsible for basic socio-economic statistics, population and other non-agricultural censuses and for economic calculations such as the national accounts, GDP, etc. A Lao expenditure and consumption survey, carried out in 1992/93 and in 1997/98, includes data items on socio-economic subjects.

In the field of agricultural statistics, the Ministry of Agriculture and Forestry (MAF) takes charge of an annual survey and of the publication of agricultural statistics. The census for agriculture was implemented under the control of a steering committee organized by NSC and MAF.

2. Agricultural statistics at the Ministry of Agriculture and Forestry (MAF)

2.1 Organization of MAF

MAF is composed of a Permanent Secretariat, eight departments and two external organizations. The departments are those of Planning, Personnel, Agriculture, Livestock and Fishery, Irrigation, Forestry, Meteorology and Hydrology, and Inspection. The external organizations are the Science and Technology Council and the Agriculture and Forestry Research Institute.

The Department of Planning has four divisions, for Statistics, Planning, Finance and Administration. The Statistics Division is the main body on agricultural statistics in MAF. Currently there are five officials in the division, although there are eight regular personnel posts.

Each technical department also has a division taking in charge statistics/information, which is called the Planning, Finance, Cooperation and Statistics Division.

In each province and district, MAF has local offices known as Agriculture and Forestry Services. Their organizational structure is a subset of the central office.

2.2. Abstract of the methods of data collection

In Lao PDR, agricultural statistics cover mainly production on crop, livestock and forestry. Data collection uses the reporting system and is made by technical departments through the MAF hierarchy from the district/province offices to the central office.

While the village is the smallest administrative organization in Lao PDR, it can be further divided into units of on average 10-12 households each. The principal data collection is made at the unit level by the responsible person of a village. The personnel of the district office gathers the village-level data then send them to the provincial office. In the provincial office, each technical section manages the data of the relevant commodities, and reports to the concerned technical department of MAF. For example, the agricultural section of the provincial office manages crop data and sends them to the Department of Agriculture. Then, the Statistics Division of the Planning Department obtain the data from the technical departments. Extension workers of the local offices also collect the information along with their other activities.

There is an officer in charge of the statistics in the provincial office who manages all of the statistical data/information and sorts out the provincial data for the administrative purpose in the province. The compiled provincial data are also sent to the Statistics Division, after they are approved by the local governments.

The technical departments of MAF are responsible for the collection of the data/information on the commodities, as mentioned above.

The Department of Agriculture and Extension collects and compiles data on the crop situation and prepares monthly and seasonal reports on important economic crops.

The Department of Forestry collects and compiles data related to forestry, quantitative exploitation and replanting of trees, source of water, and national forestry resources.

Besides the above-mentioned departments, the other departments also collect data for their monitoring and planning activities.

On the other hand, the Statistics Division of the Department of Planning is assigned to compile the collected data for dissemination. The division publishes a yearly agriculture and forestry bulletin. Additionally, for specific surveys such as the agricultural census, the division takes the initiative for coordination within the ministry. The division also undertakes the monthly collection of data on prices of

agricultural commodities and inputs for agricultural production at the provincial level.

Generally speaking, agricultural statistics in Lao PDR do not meet the requirements of data users sufficiently, due to the lack of systematic methods of collection and standardization of concepts and definitions.

2.3. Annual crop survey

In the Department of Agriculture, the Planning Division is in charge of the annual crop survey. The division collects and compiles data on crop production and technical information, and prepares monthly, seasonal and annual reports for important economic crops.

Data collection on rice, which is the main commodity in Lao PDR, is made in the dry and rainy seasons, separately for irrigated and non-irrigated fields. The growing condition of rice and other crops is reported monthly.

Contents of the data are as follows:

a. Data on crop production

Commodities

Cereals : Rice (lowland paddy rice, dry season paddy rice, upland rice), maize, tubers

Vegetables

Annual industry crops : Mungbean, soybean, peanut, tobacco, cotton, sugarcane, coffee, tea

Data items

- Planting/transplanting/sowing area (ha)
- Lost area, due to natural disaster (ha)
- Harvested area (ha)
- Total production (t)
- Average yield per unit of harvested area (t/ha)
- Annual balance of rice supply and demand, and future projection

b. Technical information

- Intensive agricultural production in irrigated areas in different provinces, including area, yield, production and advanced technology adopted
- Equipment, tools and machinery (quantity, capacity and other technical specifications)
- Supply of and demand for agricultural inputs (fertilizers, pesticides, spraying equipment, etc)

- Potential area that can be expanded in the future (for rice and other crop production)
- Land use intensity

The department also collects other related information for planning and promotional purposes.

- Annual population and projection
- Meteorological data (weekly, monthly, quarterly)
- Land use and zoning
- Marketing, produce prices and price of inputs
- Investment and production costs (in each province and region)
- Other information related to the promotion and development of agriculture
- Imports and exports of agricultural produce and inputs
- Credits released for agricultural production
- Investments in agriculture by the private sector

Crop cutting is made for three samples (good, average and poor) per village for the purpose of extension work. However, the result cannot be used for the statistics due to the small number of non-randomly selected samples. The sample plots and numbers are not fixed, they are renewed every year.

2.4. Livestock survey

The Department of Livestock and Fisheries has three technical divisions, namely the Animal Health Division, Livestock Development Division and Fishery Development Division. The Animal Health Division prepares a monthly report for livestock disease and disaster. The Livestock Development Division prepares a semi-annual report on livestock population on buffaloes, cattle, pigs, goats and sheep, and poultry, including the number of births and increase rate.

The Fishery Development Division intends to set up a new activity of data collection on fish catch and aquaculture.

2.5. Forestry survey

The Planning Division in the Department of Forestry takes direct responsibility for data collection on the forestry sector. Currently, the statistics unit of the Planning Division has three staff members. They collect and compile data in relation to forestry, such as forest area, seedling and forest plantation areas, log harvested area and volume, source of water/river, national forestry resource, etc.

Most forestry statistics are derived from regular reports from the line agencies. These reports are monthly, quarterly, biyearly and yearly.

2.6. Other statistical data collection by the ministry

The other agricultural data collected at present by the ministry are (i) crop monitoring and crop forecasting, and (ii) market information.

These activities were developed and strengthened through the Pilot Project for the Development of the National Food Security Programme GCPS/RAS/14O/ITA (LAO), funded by the government of Italy and executed by FAO, from 1993 to 1996.

2.6.1 Crop monitoring and crop forecasting

To monitor and forecast food production, an assessment of planted acreage, crop growth and yield is needed. The basic data and information for such assessment are generated from agricultural statistical surveys, agro-meteorological observations, crop condition monitoring and observation of other factors affecting harvested crop areas and per-hectare yield (like pests, diseases, etc).

All these data are normally collected by the relevant services of the Ministry of Agriculture and Forestry. Responsibility for collecting the information (except agro-meteorological data) lies with the district agricultural officers, under the guidance and supervision of the respective provincial agricultural officers. Responsibility for data compilation and analysis at the national level has been entrusted to the Department of Agriculture and Extension. Responsibility for agro-meteorological observations lies with the Agro-meteorological Division in the Department of Hydrometeorology of MAF, through its meteorological and rainfall stations, under the guidance and supervision of the provincial agro-meteorological officers.

The output of the system is supposed to be a monthly paddy crop situation report combining the information from the crop progress monitoring surveys and from the agro-meteorological observations.

After the completion of the project, the provincial agricultural officers continue to send the monthly crop progress reports to the Department of Agriculture and Extension. However, processing and monitoring of the national food security situation are severely constrained by the lack of an adequate budget, telecommunication infrastructure and human resources, especially in local offices.

2.6.2 Market information

The market information is collected through the MAF hierarchy. The Statistical Division receives and compiles the price data on 18 main agricultural commodities and 5 agricultural inputs, monthly. Data collection is done on a voluntary basis in several provincial markets. Therefore, methodological improvement is needed.

The Ministry of Commerce is responsible for the rice market from the point of view of food security. The ministry carries out information collection, processing, analysis and dissemination of paddy and rice prices monthly and fortnightly.

Regarding market information, there is a delay in information transmission from districts to provinces due to logistical problems.

2.7. Crop and livestock pilot sample surveys

Administrative reporting remains an important source of agricultural statistics in Lao PDR. However, more reliable and objective methods, such as sample surveys, are needed to improve data collection.

An FAO project entitled Training for agricultural statistics (TCP/LAO/4452) was carried out from 1994 to 1996 to develop sample survey methods for crops and livestock production and strengthen the capacity of MAF.

The two-stage sub-sampling approach was adopted as sampling method, with the village as primary sampling unit (psu) and the farm household as secondary sampling unit (ssu). Data collection was made at the farm household level.

The surveys were carried out under the control of the Statistics Section. Data were collected from each sample household through interviews by MAF district officers.

2.7.1 Crop pilot survey

The first crop pilot survey was carried out in December 1994 in four provinces to develop the sample survey method. The survey items were data on 1994 wet season rice, namely: planted and harvested area; production; seedling rate; time of seeding, transplanting and harvesting; use of fertilizers and pesticides; and crop damage, for each type of rice such as improved and local variety, short, medium and long maturing varieties, and lowland and upland rice. These data were collected from 1 494 sample households in 233 selected villages through interviews.

To obtain more reliable and objective data, crop cutting (usually 2 by 2 metres) and actual measurement of field (using compass and measuring tape) were applied for some sub-sampling to evaluate the data from the sample households.

The second crop survey for rice was implemented in 1995 in nine provinces. It had three main aims: training of field staff in provinces other than those of the first implementation; evaluation of the crop cutting technique and training of staff in its application; and providing statistics for the main rice-producing areas of the country.

The survey was undertaken from October 1995 to January 1996 to collect data on 1995 wet-season rice. The type of data collected was similar to the 1994 survey. The survey involved interview measures for 3 266 sample households in 526 selected villages, and crop-cutting experiments for 554 sample plots in 213 households.

According to the results of the surveys, the harvested area for paddy was underestimated by more than 7 percent against the existing official statistics, and for upland rice the data gap was about 20 percent. Average yields of both paddy and upland rice were also lower than official figures, by 38 percent for paddy rice and by 9 percent for upland rice. Estimated yields from crop cutting were slightly higher than interviewed data of pilot sample surveys.

**Comparison of pilot survey results with official statistics
(1995 estimates)**

	Paddy		Upland rice	
	Pilot survey	Official statistics	Pilot survey	Official statistics
Harvested area (1 000 ha)				
Vientiane Mun.	42.2	42.7	2.0	0.8
Luangprabang	6.8	9.0	30.7	38.6
Xiengkhuang	12.6	12.6	8.6	8.3
Borikhamxay	19.4	18.8	5.2	8.3
Khammuane	40.8	41.8	2.5	1.0
Savannakhet	92.0	94.6	6.3	5.5
Saravane	36.7	34.9	8.2	6.3
Champasack	84.2	77.3	2.4	3.3
Harvested area (1 000 ha)				
Vientiane Mun.	17.5	27.1	0.9	0.8
Luangprabang	6.3	8.4	28.0	37.2
Xiengkhuang	10.8	11.9	6.8	8.3
Borikhamxay	7.7	8.2	2.5	5.0
Khammuane	26.3	28.2	1.9	0.9
Savannakhet	75.9	87.5	5.7	5.5
Saravane	36.1	34.9	7.0	6.8
Champasack	75.3	71.5	2.2	3.3
Yield (tons/ha)				
Vientiane Mun.	2.12 (2.64)	3.05	1.90	1.60
Luangprabang	2.74 (1.87)	2.72	1.71	1.78
Xiengkhuang	2.98 (2.87)	2.77	1.55	1.63
Borikhamxay	1.84 (2.04)	2.05	1.41	1.64
Khammuane	1.55 (1.30)	2.68	1.19	1.22
Savannakhet	1.71 (1.64)	3.12	1.20	1.74
Saravane	1.89 (1.95)	3.03	1.58	1.62
Champasack	1.50 (1.84)	2.45	1.09	1.59
Total	1.77 (1.85)	2.83	1.57 (1.84)	1.71

Note: Figures in brackets are exercises of the Crop Cutting.

2.7.2 Livestock pilot survey

A livestock pilot survey was undertaken in May 1995 in four provinces with 1 714 sample households in 255 selected villages, following the same sampling design as for the crop pilot survey. The survey items were: number of cattle, buffaloes, pigs, sheep and goats, chicken and other poultry; age/sex composition, fertility, mortality, sales and animals slaughtered (for cattle, buffaloes, pigs and chicken), egg production; and households.

Apart from data on livestock numbers, the survey also provided a range of data on the number of livestock owners, age/sex composition of herds, birth and mortality rates, meat production, and growth rates in livestock numbers. The survey confirmed the high mortality rates for pigs and buffaloes, especially for young animals, and highlighted regional differences.

2.7.3 Assessment of the pilot sample survey

Lao PDR could acquire experience in the implementation of surveys with advanced methods. The survey results highlight weaknesses in existing crop and livestock statistics and show that sample surveys are useful to provide objective statistics.

However, due to national budgetary constraints, there was no follow-up activity after the completion of the sample survey project.

3. Role of the National Statistics Centre (NSC) in agricultural statistics

3.1 Organization of NSC

NSC is composed of five divisions, for Data Collection, Survey, National Accounts, Dissemination and Administration. There are 45 officials in the central office.

As the local organization of NSC, the local government of every province has a statistics unit, with one or two officers, under the Provincial Planning Division. Moreover, every district has a statistics and planning unit, usually with a single officer. Division and unit are under the control of the State Planning Committee.

In the field of agricultural statistics, NSC plays an important part in the implementation of the agricultural census. Economic calculations such as the national accounts, GDP and so on are also undertaken by NSC.

3.2 Agricultural census

The First National Census for Agriculture was implemented in February/March 1999, and preliminary publication was done in February 2000.

The Lao census was a joint project of NSC and MAF. The Agricultural Census Steering Committee, comprising high-level representatives of the State Planning Committee and the agriculture ministry, had overall responsibility for the census. An Agricultural Census Office was established with staff of MAF and NSC.

Sweden cooperated with NSC through the Swedish International Development Authority (SIDA) to enforce the statistical capacities by establishing the Lao-Swedish statistics programme project. The activities of the project included the Population Census 1995, compilation of the national accounts and GDP, etc. The agricultural census was one of the project subjects. SIDA provided financial and technical support.

The method of the census was developed based on the pilot census survey that was implemented in February/March 1998. The census adopted the method of part-sample census.

3.2.1 Census methodology

a. Scope of the census

The Lao Agricultural Census 1998/99 covered the whole of Lao PDR, including urban areas in Vientiane and elsewhere. The census covered only the agricultural activities of private households carried out on their own or in partnership with other households. The agricultural activities undertaken by government organizations, businesses, etc, were excluded. People living in accommodation units such as hostels were also excluded.

The main statistical unit for the census was the agricultural holding, defined as an economic unit of crop and livestock production under a single roof. There are 798 000 households and 668 000 agricultural holdings in the country.

(Reference: Definition of farm)

A household is a group of people with common arrangements for food, shelter and other acts of daily living. A household usually consists of husband, wife, children and relatives, but sometimes includes unrelated people such as live-in household or farm workers.

An agricultural holding is an economic unit of agricultural production under single management, comprising all livestock raised and all agricultural land

operated, regardless of ownership. The Lao Agricultural Census covered only those units that:

- (i) either operated 0.02 ha or more of agricultural land in the 1998 wet season or the 1998/99 dry season,
- (ii) or were raising 2 or more cattle or buffaloes, 5 or more pigs or goats, or 20 or more poultry at the time of the census.

Only household units were included in the census. The agricultural activities of businesses, government organizations, etc, were excluded.

Usually, an agricultural holding is the same as a household, but sometimes it consists of two or more households operating as a partnership.

b. Sample and complete enumeration

The census was undertaken in two parts: a complete enumeration of all agricultural holdings in Lao PDR to collect some basic data about agriculture, and a sample survey of agricultural holdings to collect more detailed information.

Two types of questionnaire were also prepared as follows:

- Questionnaire for a complete enumeration with 14 basic survey items
- Questionnaire for a sample enumeration with detailed 96 survey items

c. Sample design and selection

The sample was selected using two-stage sampling: a sample of villages was first selected, and then a sample of households was selected in each sample village. Agricultural holdings were identified by asking each sample household about their crop and livestock activities.

In most districts, a sample of 18 villages was taken, with an average of 18 households selected in each sample village, i.e. approximately 320 sample households (or 300 sample agricultural holdings) in each district. A smaller sample was taken in districts containing few villages or households. Approximately 400 households were sampled in the mainly urban districts of Vientiane Municipality.

In each district, the sample of villages was selected using a stratified systematic probability proportional to size (pps) sampling. The list of villages was created by updating the villages in the 1995 Population Census. Villages were divided into urban and rural strata, with the rural stratum being sampled more heavily than the urban stratum because of its agricultural importance. The number of households from the 1995 Population Census was used as the size measure for pps sampling. Villages were ordered geographically for the sample selection. Where household

information from the 1995 Population Census was unavailable, such as newly created villages, equal probability sampling was used.

The sample of households in each sample village was selected using stratified systematic random sampling. A list of all households in each village was prepared, with help from the village head. The households were divided into two strata based on the village head's knowledge about whether the household had 0.02 ha or more of agricultural land.

Altogether, 2 454 villages were selected in the sample. There were 42 028 sample households, or 37 846 agricultural holdings.

To obtain more accurate figures on agricultural land areas, the census involved measurement methods of agricultural land. Some agricultural fields were selected from sample households and actually measured using measuring tapes and a compass. Correction rates estimated by reported figures and actual state were used for data correction.

c. Topics covered

The census was developed based on the guidelines given in *FAO Statistical Development Series No. 5 Programme for the World Census of Agriculture 2000* (FAO 1996). Taking into account the circumstances in Lao PDR, extra emphasis was given to data on rice, because of its importance in Lao agriculture.

d. Reference period

The reference period for most data collected in the census was the 1998/99 agricultural year, covering the 1998 wet season (May-October 1998) and the 1998/99 dry season (November 1998-April 1999). Livestock data refer to the day of enumeration.

e. Census operations

The census data collection was undertaken from 22 February to 19 March 1999. Some 1 200 enumerators were used for the sample component, and 2 200 enumerators were used for the complete enumeration component. The enumerators were government employees from the districts, including teachers. Ten-day training courses were held for enumerators. Field supervisors, appointed from SPC and MAF, trained the enumerators, supervised the field operations and checked the completed census questionnaires.

Census questionnaires were returned to NSC in Vientiane for computer processing.

4. Conclusion and expectations

Lao PDR used to be under a socialist economic system. The data collection system was designed to satisfy the needs of a centrally planned economy, which has now been replaced by a market-oriented economy. Various central planning models were used to organize agricultural production. Agriculture was collectivized under the direct control of the government. During the socialist economic era, the reporting system managed to collect a certain amount of accurate data, but now, under the market-oriented economy, there are problems with data collection. For example, formerly, the administrative organization could assess the amounts of agricultural produce easily because it was also in charge of collecting them. Now that the farmers can sell their produce directly to merchants or to millers, the administration has a hard time obtaining reliable information.

In Lao PDR, regular data collection on food and agriculture relies on the reporting system using the MAF hierarchy. There are some issues on data collection by this system, as follows:

- There is no unified definition, standard, questionnaire or manual. Every local office reports to the upper organization by original forms and definitions.
- Omissions in reports from the grass-roots level happen often. But they are very difficult to correct due to poor communication infrastructure.
- The constraint of language exists in the villages of minorities.

Accuracy in data collection has been questioned. In fact, the FAO-supported pilot sample survey on rice showed overestimation against existing statistics. Since rice is the most important commodity, accurate and timely data production is strongly needed for the food security issue. Domestic production is one of the elements to estimate the amounts to be imported to compensate for the chronic shortage of rice.

In this regard, it is recommended to introduce the sample survey system at least for rice to collect the data directly from the survey subjects such as firm households and farm fields. For this purpose, a sampling frame is needed, which the result of the agricultural census published in 2001 will provide. To assess household interview results and obtain more objective data, the introduction of crop cutting and of the measurement method should be considered under the sampling survey system as pilot implementation of the rice sample survey.

However, as a sample survey system may require much budget and manpower, the coverage should be limited to rice and main livestock. Other commodities could rely on the reporting system.

The reporting system should also be improved through unified regulation, definition, questionnaire and manuals. Training of personnel in provincial and district offices is

indispensable to unify the method and strengthen basic statistical methods. The results of the census will be a good benchmark for the reporting system. Village-level data of the census should be gathered by the local offices of MAF.

Furthermore, according to the progress of the market economy, the range of data is increasing in terms of economic statistics and market information. These kinds of statistics are expected to develop and to be a challenge in the future.

The agricultural census has been useful to the government and other data users, who can understand not only the structure of agriculture in Lao PDR and the importance of statistics but also the data gaps and future development of statistics. Implementation of the census is expected at ten years' intervals at least.

Wide dissemination of data in a timely manner will benefit data users greatly. The information technology system using databases and the Internet will be the main means for this purpose.

Consideration should be given to the preparation of laws concerning statistics for the smooth implementation of government statistical surveys and to convince the people of the importance of statistics and of the need to cooperate.

Organization Outline of MAF

