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IN ASIA AND PACIFIC COUNTRIES
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Session 1

The system of food and agriculture statistics in the Lao PDR

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1. Overview

The Lao People's Democratic Republic (the Lao PDR, a.k.a. Laos) is a landlocked country situated in the centre of the Indochinese peninsula. It is bordered by China, Viet Nam, Cambodia, Thailand and Myanmar.

The agriculture sector, which comprises crops, livestock, fishery and forestry, is the most important economic sector in the Lao PDR. It accounts for the largest share of GDP, contributes about 40 percent of officially recorded foreign exchange earnings plus an estimated 15 percent in unofficial earnings, and is the main source of income for about 75 percent of the labour force.

The improvement of the capability to formulate plans and policies must proceed from an improvement in data collection and appropriate use of the great variety of statistical data.

In the past few years, the Ministry of Agriculture and Forestry has received technical assistance from the Food and Agriculture Organization of the United Nations, under Project TCP/LAO/44252, to improve agricultural statistics, and the Swedish International Development Authority has provided the financial support for the agricultural census, which was carried out in early 1999 based on the guidelines of the FAO Programme for the World Census of Agriculture 2000.

2. General status of the agricultural statistics system

At the central level, the agriculture and forestry statistics information system is a decentralized system involving several institutions, each with its specific assignment.

1. The National Statistics Centre under the State Committee for Planning and Cooperation is responsible for population and other non-agro-forestry censuses and sometimes for agro-forestry censuses in selected provinces.

2. The Statistics and Planning Division of the Cabinet of the Ministry of Agriculture and Forestry has been assigned the collection and compilation of data related to agriculture and livestock from various sources to prepare and distribute a yearly bulletin on agriculture and forestry statistics. The division also undertakes the collection of data on prices of agricultural commodities and of inputs for agricultural production. It is also responsible for

the cooperation and coordination with other relevant agencies over specific survey activities, for example surveys on key foodstuffs, livestock survey, agricultural acreage and measurement survey, or survey on household production costs and the socio-economic situation of farmers. However, such surveys are conducted on a pilot basis in a few provinces only.

3. The Department of Agriculture and Agricultural Extension collects and compiles data on the crop situation and prepares monthly and seasonal reports on important economic crops based on information received from the provincial and district offices of the department.

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

5. Besides the above-mentioned departments, the Department of Meteorology and Hydrology, the Irrigation Department, the Rural Development Division of the Cabinet, and the Personnel Department also collect data, mostly for their monitoring and planning activities.

The current agricultural statistics system is based on administrative reporting. Each report is presented in the form of a general overview from the district to the provincial agriculture and forestry services of the concerned sector for study and analysis. The results of this analysis are forwarded to the Division of Statistics and Planning of the Ministry of Agriculture and Forestry. Most statistical data cover planted area, production and yield of main crops, and number of livestock. The generation of data is not yet systematic due to the lack of standardization of statistical concepts and procedures and to non-compliance to requirements. The agricultural data is normally published in the agriculture and forestry bulletin issued yearly by the ministry.

Other agricultural data collected at present by the ministry are the prices of agricultural commodities and inputs; this is done on a monthly basis. In addition, the reporting system on crop monitoring and crop forecasting, which is also an attempt at early warning, is being introduced in many provinces under the FAO project GCPS/RAS/140/ITA.

FAO is helping improve the method of collecting data by using sample surveys in order to estimate statistics on crops and livestock. Three sample surveys have been carried out: one on livestock and two on rice cropping in various provinces.

The improvement of agricultural statistics in the future should focus on:

- collecting data from primary sources, especially by using the systematic sampling method to provide more reliable statistics than has been the case so far;
- widening the scope of existing agricultural statistics to meet the requirements for planning in the market economy; and
- widening the publication of statistics to ensure the dissemination of adequate data on time.

3. Outline of the statistical system

Agricultural statistics can be considered in four different types: agricultural censuses, current agricultural statistics, early-warning information and other agricultural statistics.

3.1 Agricultural censuses

The Lao agricultural census is part of a worldwide programme of agricultural censuses which started in the 1930s. Over 130 countries are now participating in that programme; many of these undertake agricultural censuses every ten years. The Lao Agricultural Census 1999 was the first such census undertaken in the Lao PDR. It is being conducted in all districts and is one of the largest and most important statistical collections ever undertaken in the country.

A report entitled 'Highlights of the census and output presentation' is available.

3.2 Current agricultural statistics

Current agricultural statistics refers to important national statistics required regularly to measure the agricultural output and the contribution of the agricultural sector to the national economy. Such statistics include crop production and livestock and are the core of the agricultural statistics system. Annual agricultural statistics have three main components:

a. Crop statistics

Important crop statistics consist of planted acreage, harvested acreage, yield and production of main crops. They are required once a year. Some preliminary statistics may be collected before harvest time. The compilation and processing of the statistical data must use data from various sources.

- The data from the agricultural census must be the basis for the estimation of planted acreage for rice, seasonal crops, and trees.
- Reporting of an administrative nature as carried out at the village level must be used to monitor changes in planted acreage. The design of such a system must be carried out by phase to avoid difficulties, as currently encountered in administrative data. There is a need to standardize statistical methods by training the people responsible for reporting and processing the data and by improving quality-control mechanisms.
- A yearly crop survey in compliance with standard statistical techniques must be carried out during dry and wet seasons. Crop surveys must be based on the sampling method and on well-supervised field activities in order to get good-quality data. (Special production surveys may be necessary for other crops to estimate yields; see *Other agricultural statistics* below.)
- The national rice survey using samples as in the FAO project must be carried out every three years to check administrative statistics and to give detailed information on various seeds of paddy, use of scientific fertilizers and other inputs, and so on.

b. Livestock statistics

The main livestock statistics currently required are the yearly estimate of the number of livestock and livestock products (milk, meat, eggs, etc). The compilation of statistics must use data from various sources:

- Data on the number and age and sex structure of livestock obtained from the agricultural census should be the basis for livestock estimations.
- The administrative reporting system should be used to keep track of changes in livestock numbers and procedures similar to those of the agricultural report system should be followed to ensure high-quality data.
- The national livestock survey using the sampling method must be conducted every three years to provide details on age and sex structure, fertility, mortality, egg laying, abattoir slaughter, and meat sale. This method will assist the estimation of livestock numbers and of livestock products, and can also be used to check the administrative reports.

c. Price statistics

In a market economy, price statistics are very important for government, farmers and traders alike. Various kinds of information on price are needed: consumer price, farmer price at point of sale, and price of agricultural inputs.

A review of the ministry's monthly price collection should be made to obtain the required information (e.g. farmer price) and check on sources (e.g. data from farmers, from rice mills, etc). There is a need to avoid overlapping or duplication of efforts among the various agencies involved. Price statistics are useful only when they are available on time. Data should be published at least once a month.

3.3 Early-warning information

Early-warning information based on the reports of field-level agricultural offices is an important requirement for statistics. Such information can be used to estimate crop production and forewarn the government about the food-supply status, which is of paramount importance in a country facing frequent droughts and floods as our does.

The current crop monitoring system should be expanded to cover the whole nation and reports on the crop situation should be provided on a monthly basis.

Once the results of the agricultural census are available, the detailed analysis of topics of interest to the ministry, such as regional cropping patterns, small landholding, women in agriculture, and studies of farmers growing particular crops, will be undertaken.

3.4 Other agricultural statistics

Apart from the data required for the agricultural census and current agricultural statistics, other types of information are needed from time to time, such as:

- Household income and expenditure of the farmers: a household-level survey is needed once every five years to measure the living conditions of the rural population and to establish price indexes.
- Production costs: there is a need to carry out, once every five years, a survey at household level in order to establish estimates of production costs which can also be used to estimate the gross domestic product.
- Post-harvest losses: there is also a need for small-scale surveys of rice-producing farmers in order to come up with reliable estimates of the food-supply capacity.
- Livestock products: a specific census or case study is also necessary for the measurement of certain characteristics of livestock products (e.g. milk or meat production) in order to establish improved estimates of current livestock products.
- Crop productivity: a small-scale study for the measurement of the productivity of various non-rice crops.

All of the above is needed to gear agricultural statistical work toward the provision of agricultural information which will be of service to the government and the private sector alike for decision-making and planning in a market-economy environment.

Session 2

The first census of Lao agriculture: methodological review of data collection, analysis, use and dissemination

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1. Objectives

The main objectives of the census were 1) to provide data on the area of all agricultural land and its use for crops, the number of all livestock, and the structural characteristics of agricultural and livestock holdings, and 2) to provide a base for surveys of crops and livestock.

The census was designed using the FAO guidelines adapted to Lao conditions.

2. Institutional arrangements

The Lao census is a joint project of the National Statistics Centre and the Ministry of Agriculture and Forestry. The Agricultural Census Steering Committee, comprising high-level representatives of the State Planning Committee and of the agriculture ministry, has overall responsibility for the census. An Agricultural Census Office, comprising staff of the agriculture ministry and of the National Statistics Centre, has been established to carry out the census. The Swedish International Development Authority is providing financial and technical support.

3. Timetable of census activities

The timetable for the census is as follows:

- 3-10 February 1999: Training of enumerators
- 11-12 February 1999: Training for area measurement
- 22 February-19 March 1999: Data collection
- 22 March 1999: Deadline for the return of questionnaires to the supervisors
- October-December 1999: Preparation of the national report
- January-June 2000: Preparation of the provincial reports
- June-September 2000: Preparation of the analytical report

4. How the census is conducted

The Lao agricultural census involves the collection of information on crops and livestock from all 800 000 households in the country. Two types of data collection were undertaken:

- In some villages (called sample villages), enumerators collected detailed crop and

livestock information from sample households, and some basic crop and livestock information

- In all other villages (called complete enumeration or CE villages), enumerators collected basic crop and livestock information from all households. No detailed data were collected.

Two groups of enumerators were formed for the data collection. One group did the data collection in the sample villages (sample enumerators), the other collected the data in the CE villages (Complete Enumerators).

Sample enumerators used two main questionnaires: the long questionnaire (Form 5) to record the detailed data from the sample household and the short questionnaire (Form 4) to record basic data from all other households.

5. Area measurement

Pilot survey work done during the project showed that area data as reported by farmers was often erroneous. The census involved some measurement of agricultural land, using compasses and measuring tapes. It was not possible to measure all agricultural land, so the work was done on a sample basis.

6. Data collected

The census covered the following topics:

- Area of agricultural land
- Number of parcels of agricultural land
- Land tenure
- Land use
- Area of land irrigated and source of irrigation
- Area of each temporary crop planted
- Mixed cropping
- Permanent crops (number of trees, area of compact plantation, productive and non-productive trees)
- Use of agricultural inputs (improved seeds, fertilizers, pesticides)
- Livestock number by type according to age and sex
- Use and ownership of machinery
- Age and sex of agricultural holder
- Demographic and labour characteristics of household members
- Use of household and outside labour for work on the holding
- Miscellaneous (ethnic origin of the holder, main use of farm produce, aquaculture facilities, etc)

7. Publication of results

Village- and district-level tallies for the core census data items are produced in each of the district offices. A preliminary report on the census, providing preliminary figures on the number and size of agricultural holdings, the area of each temporary and permanent crop, and livestock numbers, was prepared during the second half of 1999.

All data collection forms were forwarded to Vientiane for computer processing. A series of reports presenting detailed results of the census and analysis of the main findings are due to be released later this year (2000): the national report, presenting detailed results at national and provincial levels; provincial reports (one per province), presenting detailed results at district level; and one or more analytical reports, presenting analysis of the main findings of the census.

8. Uses and users of the agricultural census

The census results will be used by three main groups: government organizations, research institutions and private traders.

Session 3

Data collection for crops, livestock and forestry by the Ministry of Agriculture and Forestry

Agricultural statistics in the Lao PDR

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Livestock statistics in the Lao PDR

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Agricultural statistics in the Lao PDR

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The Department of Agriculture is a central administrative section of the Ministry of Agriculture and Forestry, which has been contributing to the implementation of the Sixth Decision of the communist party's politburo. The department generates, provides as well as uses various statistical data for the development of agriculture in the whole country. This statistical information is very important for policymakers and development planners. Good policies, decisions, plans and regulations are the key to overall management of the agricultural sector. All agricultural statistics are interrelated but their usefulness depends on the users.

Agricultural statistics (i.e. data and information) have long been a key element for monitoring and directing the implementation of agricultural plans. Good plans and policies depend on the quality of available statistics. Agricultural development takes into account the medium- and long-term appropriateness of these policies and plans.

Since the Department of Agriculture has recognized the value of statistics in its development, it has kept good collections of data on the production of various crops, particularly the production of food and commodity crops in both wet and dry seasons. The information the department handles concerns rice, vegetable crops, fruit crops, maize, leguminous crops, sugarcane, cotton, tobacco, coffee, tea and other crops. Besides the data and information on crop production, the department also has information on agricultural inputs, intensive agricultural techniques, investment, export of agricultural produce, and agricultural infrastructure development.

I. Network and techniques of data collection

1. Vertical network of data collection in the agricultural sector

All services, centres, stations, projects and various technical units under the responsibility of the Department of Agriculture collect data at the grassroots and pass them on to the department on a regular basis, in the form of formal reports or of summary tables.

- The agriculture section of each provincial, municipal or special-zone agriculture and forestry office sends regular reports and tables to the Department of Agriculture. The routes of information transfer include fax and phone. Each section reports on a weekly basis, so that the department can keep track of the progress of the agricultural development at any time.
- The provincial, municipal and special-zone agriculture sections collect data and information from the district agriculture and forestry offices (agriculture units) under their

responsibility. Their staffs also go to the grassroots to collect data whenever necessary. The agriculture staff at the district level report to their respective provincial, municipal and special-zone agriculture sections by fax or phone.

- The agriculture unit in each district collects data at the grassroots and reports to the agriculture section of its province.
- Apart from the regular reporting system, urgent reports are also made, for instance in the case of natural calamities such as floods, droughts and pests and disease outbreaks.

2. Horizontal network of data collection

Apart from receiving information through the line agencies, the Department of Agriculture also receives information from other sources in the private and public sectors and from international organizations such as FAO, UNDP, the World Food Program, the World Bank and the Asian Development Bank.

The public sector consists of all departments and agencies of the Ministry of Agriculture and Forestry, the Agricultural Promotion Bank, the State Planning Committee, the Ministry of Commerce and Tourism, the Ministry of Finance, and others. In the private sector, companies and business units involved in importing and exporting agricultural inputs and produce are the sources of information.

II. The Planning Division of the Department of Agriculture is responsible for data collection and processing

Regulation No1397/MAF/DOA/99 of 28 July 1999 regarding the administrative structure and operation of the Department of Agriculture makes it clear that agricultural data collection and processing are the responsibility of the Planning Division of the department. This division is responsible for designing data collection forms, in close cooperation with the agencies of the various sectors concerned. After processing the data, the department forwards the information to the Ministry of Agriculture and Forestry on a regular basis (weekly, monthly, seasonal and annual reports). Data processing is necessary to minimize the errors accruing during data collection (using statistics principles).

III. Contents and types of data

1. Data on crop production

- Planting area, transplanting area and sowing area (ha)
- Lost area, due to a given calamity (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
- Crop production in each season and annual total

2. **Technical information**
   - Intensive agriculture production in irrigated areas in different provinces, including area, yield, production and 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
   - Research work that can be used for extension
   - Training, extension and improvement of knowledge and skills in handling agricultural statistics

3. **Other information necessary for planning and projecting future agricultural development**
   - Annual population and projection
   - Meteorological data (weekly, monthly, quarterly frequency)
   - 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

IV. Problems of agricultural data collection and processing

Recent agricultural data collection and processing has experienced a number of weaknesses and constraints:

- The information flow is not sufficiently effective, including communications between the department, the province, the district or zone and the village.
- Reporting is often delayed.
- Information is incomplete and distorted.
- There is a lack of staff with sufficient knowledge and skills in agricultural statistics, compounded by an inadequacy of tools, equipment for measuring, calculating, recording and analysing the data, especially at grassroots level.
- The data collection forms and survey forms do not provide all the agents involved with the definitions used in data collection. This creates misunderstandings, which result in faulty data.

V. Some techniques that can be adopted to improve agricultural statistics

- Categorize the data into groups and make the definitions clear to all.
- Improve the design of tables and survey forms so that the users can understand them easily, and provide more information.
- Improve the knowledge and skills in agricultural statistics of the staff concerned.
- Search for ways to obtain the tools, equipment, vehicles and funds necessary to achieve the quality needed in agricultural statistical work.
- Coordinate with all sectors involved in agricultural data collection and processing.
- Establish and improve the agricultural information system with advanced technology.

VI. Recommendations

To ensure an accurate agricultural statistical system able to provide the reliable and timely information required by the users, the following recommendations are in order:

- Establish an agricultural information centre within the Ministry of Agriculture and Forestry so that all the information related to agriculture and forestry is available from the same place.
- Strengthen the current vertical and horizontal information flow networks.
- Correlate the initial data with data from other sources before the information is released for use.

Livestock statistics in the Lao PDR

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1. Background

In recent years, there has been a stable increase in livestock production in the Lao PDR, as indicated by the growth in the number of each livestock type and by an increase in the volume of credit released to farmers for livestock production. Investment in livestock production by the state and the private sector has also increased. However, a number of problems exist in the sector: livestock mortality rates are still high, statistical data are imprecise, there are gaps in the information flow, reports are often delayed, regulations on livestock management are not sufficiently efficient and precise, and the infrastructure, technology and human resources of the livestock sector are still not up to standards for effective operation of the sector.

There are many reasons for this state of affairs, and livestock statistics are one.

The first national agricultural census carried out by the ministry of agriculture is an historical benchmark which provides common livestock statistics for the whole country.

2. The importance of high-quality statistics

Livestock statistics are important for all sectors concerned. If these statistics are of a low quality or do not present the real situation, the following main problems surface:

- Planning at all levels (from the centre through to local level) becomes biased, as it is based at best on guesstimates.
- Objective setting for each leading level does not coincide with the prevailing potential of each region.
- Monitoring and evaluation of progress in project implementation faces difficulties. Evaluation of the effectiveness of plans or projects is not accurate because the statistics used for monitoring come from fancy reports.

Not only developing countries but also developed nations experience difficulties in collecting reliable data and maintaining statistics that are a hundred-percent accurate. Nonetheless, attempts should be made to collect statistics as accurate as possible.

3. Evaluation of present data collection for statistics

3.1Fundamental strengths

- Nationwide livestock statistics have been made available.
- The growth of the livestock population has been recognized in each province.

3.2Main weaknesses

- Recent livestock statistics do not include animals raised for industrial purposes.
- Livestock data collection is mainly conducted during the dry season, when conditions are not suitable for livestock production, as most cattle and buffaloes are left to graze freely in the wild, or are sold and slaughtered.
- The interviews do not cover all families but zero in on only a few villages and districts and then the total number is estimated for the whole country.
- The personnel collecting data have limited technical knowledge and interview experience, thus do not understand the importance of high-quality statistics.
- Villagers often hesitate to cooperate. They fail to provide accurate data. They answer questions merely for the sake of getting through the ordeal and being rid of their nosy guests.

The above weaknesses are the main reasons why the data collected so far are not accurate or do not reflect the true state of livestock in any given year. There is a need to figure out by how much the real picture is distorted.

4. Some questions to be considered

Once they are released by the government, agricultural statistics can be used to make programmes or plans. However, in order to use available statistics effectively, the following questions must be considered:

- Why has the national agricultural statistics survey been done?
- Is there an annual plan for improving and processing the data and information at hand?
- Which statistics have to be reported on a yearly basis?
- How can their reporting be made quickly and accurately?
- What kind of feedback system between the central and local levels will provide quick and accurate information?

5. Data collection

5.1 Value of data collection

Data collection is essential to livestock development. It is a key element in planning livestock production over the short, medium or long term in order to ensure a normal growth rate. Accurate statistics are the key to the evaluation of previous work and the projection of future livestock production so that it can meet consumption demand.

Keeping good records of livestock health is also very important to prevent outbreaks of

animal disease, as proper records allow us to identify the types of disease occurring in each village and region each year. With good record keeping one can also identify the causes of a disease, and thus look for appropriate control measures. Disease outbreak forecasting and preparation of prevention and control measures are possible only if reliable information is available. Good forecasting warns farmers about an expected outbreak so that they can prepare for it and a proper livestock disease-outbreak warning system is needed. The current forecasting system, based on low-quality statistics on livestock production and livestock health, is not effective. The areas where diseases occur regularly and the causes of such diseases are not well defined. As a result, forecasting of disease outbreaks and preparation of preventive and control measures cannot be effective. This leads to difficulties in planning for livestock production, and in providing information to the relevant international organizations as well.

Therefore, it is important for livestock and veterinary staff members to endeavour to keep complete records of livestock production and health so that they can be used to minimize livestock diseases. Once the diseases are minimized, livestock production can increase at an expected rate for production to meet demand at all times.

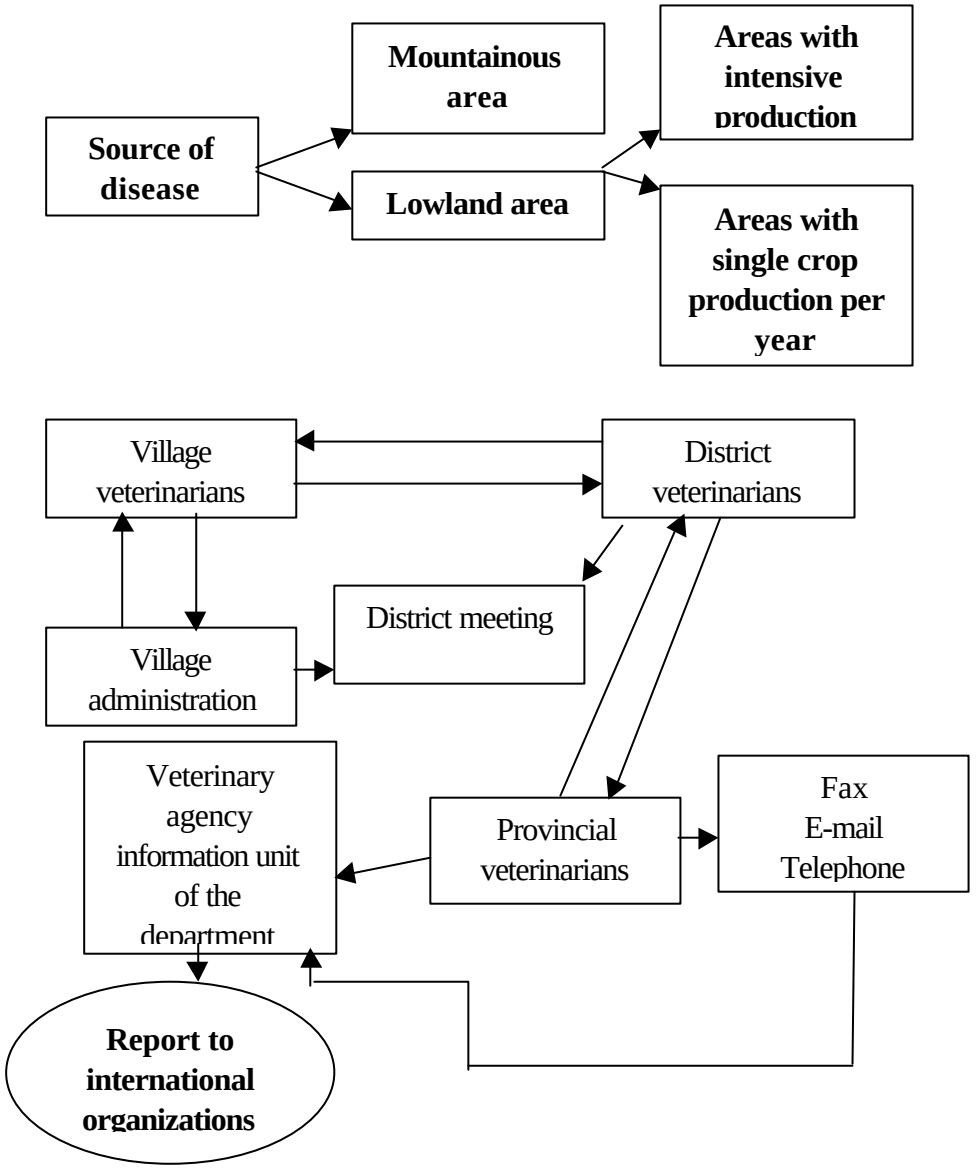
5.2 What are the required statistics?

1. Annual livestock and fishery statistics
2. Statistics of livestock and fish production management
3. Size of farms and numbers of livestock and fish, privately owned, family-owned, state-owned or owned by production groups
4. Livestock disease statistics

5.3 Data collection procedures

1. Use the vertical communication network, reporting at three-month, six-month and one-year intervals.
2. In case of a disease outbreak, prompt reporting has to be done in order to inform the Veterinary Agency within three days, starting from the date of the disease-outbreak notice, so that control measures can be taken to prevent the disease from spreading to other regions.
3. The following diagram shows the existing reporting routes:

Existing reporting routes



5.4 Means of data collection

1. Use the existing village livestock and veterinary staff to collect data at grassroots level. These staff members must have received training on livestock production and veterinary principles.
2. The village administration (village head) is responsible for filing the data for the village and forwarding them to the district on a monthly basis, by way of meetings. Livestock and veterinary staff members attend such meetings to gather the relevant information.
3. Provincial livestock and veterinary staff collect the information then report to the central level through the vertical communication network.
4. Use the electronic system.
5. The staff collect specific information as needed.

6. Conduct training on data collection and transfer.

5.5 Documentation

The provincial livestock and fishery sections collect and document the data, then forward them to the agency or the department.

Forestry statistics in the Lao PDR

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I. Present status of data collection

1. Implementation procedures

The Department of Forestry is a central administrative section of the Ministry of Agriculture and Forestry. It consists of three divisions, two agencies and one project. From Regulation No1399/MAF/DOP/99 of 28 July 1999 regarding the role and function of the Department of Forestry, and Article 5 regarding the apparatus responsible for sectoral statistics, it is clear that the Planning Division takes direct responsibility for data collection and analysis and for maintaining the statistics system of the forestry sector. Currently, the statistics unit of the Planning Division has three staff members, who are involved in collecting and organizing forestry statistics from the various technical sectors concerned. The unit collects and processes the data, and in turn sends the necessary information to the Statistics Division of the Department of Planning. This information is then incorporated into the agriculture and forestry statistics yearbooks.

2. Means of data collection

- Most forestry statistics are derived from regular reports from the line agencies. These reports are monthly, quarterly, biyearly and yearly.
- Reporting is done by fax or phone, depending on the format required by the centre.
- Data collection notices are disseminated from the centre in case of an urgent need for information. Once the data have been gathered and analysed, the organizations responsible for data collection and analysis have to check the data with their data sources (by phone or fax) before reporting to the leading apparatus.
- The statistics unit of the Department of Forestry collects the information from various sectors of the department, such as concerned divisions, agencies and projects, as well as from all forestry sections in the country. Once it has collected all the necessary data, the unit conducts a meeting specifically to discuss and agree on the collected data before forwarding them to the leading apparatus.

3. Data processing and information reporting system

The reporting system is based on the double target of meeting two priority programmes of the Ministry of Agriculture and Forestry, namely the slash-and-burn cultivation stabilization and

permanent job allocation programme, and the commodity production programme. Common reporting is done monthly, quarterly, biyearly, nine-monthly, yearly and quinquennially.

Weekly meetings are held in order to pool the data that all the concerned sectors have collected. These meetings are important to assess progress in the implementation of the plan, by checking what has been done and what remains to be done, and to identify and handle problems. They allow all collected data to be pooled, processed and analysed, so that each period report can be compiled and forwarded to the leading apparatus.

4. Strengths, weaknesses and recommendations

a. Strengths

- Data collection, processing and reporting has gained considerable speed with improved quality of work. The statistics unit has done its very best to function as the essential representative of the leading apparatus.
- Satisfactorily accurate information is thus available.

Sources of strength

- The leading apparatus always perceives the importance of the statistics unit and provides it with sustained support and advice.
- The tools and equipment used for planning and collecting the statistical data are comparatively advanced.
- Some staff members are knowledgeable and skilled in data collection and processing.
- All concerned sectors recognize the significance of the work and fully cooperate with one another.
- The staff members responsible for the statistics are active, and take their tasks seriously.

b. Weaknesses

- Reporting is often delayed and lacks consensus on the contents.
- The data collection forms distributed to the province are not used by the provincial and district staff, who still go by their old ways of data collection, leading to low quality of the data. Processing and reporting are done at the last minute, further imperilling the accuracy of the data.
- A system for monitoring the accuracy of the information is lacking.

Sources of weakness

- The detailed objectives of data collection are not commonly set at the local level for each term, but rather depend on the annual plan.
- Data collection by the provincial staff does not truly represent the real situation of each district and village, and some reports are mere flights of fancy.

- Limited budgetary allocations are not sufficient to properly carry out data collection.
- The staff members responsible for the statistics and planning have limited knowledge and experience.
- The tools and equipment for data collection are inadequate, and the ability of the staff to use the equipment is limited.

c. ***Recommendations***

To turn agriculture and forestry statistics into a system with operational objectives common to all concerned sectors, and reliable for the leading apparatus, the following issues have to be considered:

- The Department of Planning (especially the Statistics Division) of the Ministry of Agriculture and Forestry should pay more attention on advising and training the provincial staff on how to properly carry out planning and statistics work. This is very important for systematizing data collections throughout the country. This systematization includes specifying the timing of the reports.
- Training, and sharing experience, should be done among the various sectors of the Ministry of Agriculture and Forestry. Overseas training is also necessary so that the forestry staff can gain further knowledge and experience in dealing with data and disseminate their newly acquired technical know-how within the country.

II. Value of statistics for the forestry sector

The agriculture and forestry sector is the main component of the Lao economy, accounting for more than half of the gross domestic product. To provide the high-quality and productive information needed to facilitate annual planning, it is necessary to have reliable statistics on agriculture and forestry production and socio-economic factors at all levels.

Timely supply of good-quality statistics requires different timing: policymakers often require general statistics over periods of five or ten years, although the time span will depend on whether the policy is made for the short or the long term, whereas planners require more detailed and complete statistics to devise a strategy, and information on specific topics to design programmes and projects. These statistics are required over shorter time spans, monthly, biyearly or yearly.

Whether the data collection achieves its objective or not depends on the quality of the planning and on the implementation of a plan, programme or development project. The more precise the statistics, the more precise the planning: hence the greater likelihood that the development objectives will be achieved.

The three categories of information needed by policymakers are:

1. Socio-economic data, population, population growth rate, ethnic composition and distribution, lifestyles, income, national revenue, living conditions, economic potential, strengths and constraints of development.

2. Geographical conditions: total area of the country, land utility, topography, soil productivity, water resources, rainfall, temperatures, seasonal fluctuations.
3. Forestry statistics: total forest area, types and distribution of forest, forest composition, quality and quantity per forest type, forest use, forest products and forest services, domestic use (subsistence or industrial use), production capacity, demand and sources of raw materials for processing, prices, values and marketing.

III. Prospects for improving statistics

To progressively improve and develop a reliable statistical system, it is necessary for decision-makers at the top and the staff of all concerned sectors to perceive the importance of cooperation in work implementation. Based on this requirement, the statistics unit for forestry would like to make the following proposals for improvement:

- The Department of Forestry should coordinate with the Department of Planning in revising the existing data, in order to identify those that are necessary to reflect the present situation of the forestry sector.
- The department should continue to collect, process, analyse, summarize and distribute the information on the forestry sector, and should coordinate with statistics units in related sectors, especially with National Agriculture and Forestry Institute (NAFRI) and other departments of the Ministry of Agriculture and Forestry, in order to exchange data and minimize overlapping in data collection.
- The statistical network at province and district levels should be improved according to Decision No01/PM.

Therefore, the information necessary for macro-policies is as follows:

1. Forest resources

- Changes in area and condition of each forest type
- Annual production and condition of forest areas
- Reserved forest areas and their condition
- Information as periodic forest surveys
- Area and condition of forest affected by shifting slash-and-burn cultivation
- Production potential of natural forest each year

1.1 Information on reserved forests

- Important watershed areas and their condition
- Biodiversity (both wild animals and plants)
- List of natural reserved forests
- Cultural and recreational areas
- Areas with good natural views with tourism potential
- Research areas

1.2 Forest plantations

- Area and condition of planted forest each year

- Species and quality of forest-tree seedlings produced by each province each year
- Area planted and technology adopted
- Types of planted forest (commercial or home-scale plantation)
- Cost of forest planting
- Source of seeds, nursery techniques, growth rate of seedlings of different species
- Sectors involved in forest planting
- Source of funds for forest planting

1.3 Information on production forests

- Type of and planned timber volume, and approved logging volume compared to the annual logging capacity
- Type and species of trees logged and transported to Station II and the factories
- Value of timber products
- Price of each timber type
- Marketing techniques
- Sector issuing logging permits
- Sector controlling logging activities
- Situation of illegal logging
- Reasons for over-logging or under-logging (compared to the annual plan)
- Transportation mode of logs and timber products
- Type and volume of timber
- Market for timber, and prices
- State income generated from timber products

1.4 Types of existing information

- Information on slash-and-burn cultivation stabilization and permanent job allocation
- Number of families that have stopped slash-and-burn cultivation activities in each village
- Reduction rate of slash-and-burn areas in each province
- Reasons for a reduction in a slash-and-burn cultivation area
- Process of slash-and-burn cultivation reduction
- Priority areas that need attention
- Resources required in the process of reducing slash-and-burn cultivation
- Organization involved in reducing slash-and-burn cultivation

2. National economy

- Contributions of the forestry sector to the GDP, currency exchange gains, livelihood of the ethnic groups in rural-area employment creation
- Conservation and protection rights, especially on water resources
- Forest products and services provided to other sectors

3. Industrial and marketing issues

- Type and capacity of timber industries (sawmills, furniture factories, etc)
- Type, quantity and quality of raw materials from various sources
- Type, quantity and quality of timber products from various industries

- Main markets for timber products (including international markets)
- Prices and value (including exports)
- Transportation mode and cost
- Taxation system and incentives to the timber industry and to timber markets
- Natural protection, environment protection and recreation

4. Institutional and research issues

- Number of staff members in the forestry sector, including education level, capacity and experience
- Type of information and specific scientific issues to be discovered and solved through research

5. Other sectors that affect or need timber products and forestry services

- Processing industries
- Agriculture and livestock sector
- Hydropower development sector
- Mining sector
- Architecture
- Rural development projects
- Tourism
- Education
- Other

Session 4

Compilation and use of the national accounts and the gross domestic product in the case of agriculture

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Methods of calculating the GDP in the Lao PDR

There are three methods for calculating the gross domestic product or GDP: the production approach, the income approach and the expenditure approach.

Production approach: This is the total value added of the three sectors of the national economy, namely agriculture, industry and services.

GDP = VA = (GO-II)
+ tax and customs duties
– government subsidies

Expenditure approach: GDP = C + I + [X – M]
in which: C = Consumption, I = Investment and [X – M] Net exports

Income approach:

GDP = wages (salaries) + business income/mixed income + indirect business tax
– subsidies + depreciation

In the Lao PDR, we use only the production approach.

GDP at current prices measures changes in price and quantity (P*Q); it is used to calculate the **GDP per capita**. **GDP at constant prices** measures only changes of quantity (Q) and is used to calculate national economic growth.

Structure of the GDP

The contribution of agriculture to the GDP (and its share of employment) has begun to decline, especially since 1988, as buoyant growth in manufacturing has expanded the share of industry. In 1999, agriculture accounted for an estimated 52 percent of the GDP, industry for 20 percent, and services 28 percent.

Measuring the total gross output of the agriculture sector

To measure the total output of crops, forestry and fishery is very difficult because the production cycle is often longer than one year. So planted crops, forest trees, fish in the water and draught animals, we call semi-products. It is only when crops are harvested, forest trees cut, animals slaughtered and fish captured that we can calculate the value of the gross output.

Measuring the **gross output** of agriculture

- For crops
  = value of sale of the total product
  + value of product paid in kind
  + value of product exchanged with other persons
  + value of product stock for seed
  + value of change in stock

- For forestry and capture fishery
  = value of timber cut from the forest or of captured fish
  + intermediate consumption

- For livestock, in the case of a company or household raising livestock for sale within one year, the gross output is:
  = value of livestock or cultured fish sales
  + value of livestock paid in kind
  + value of livestock exchanged with other persons
  + value of animals slaughtered for own consumption

The gross output for livestock is based on new births in the year, excluding the calves born during the previous year.

The **value added of agriculture** is calculated with the following source data from the Ministry of Agriculture and Forestry: 1) production of rice and crops; 2) number of logs (timber) and forest products; and 3) number of livestock.

Constant prices and the value added coefficient are used for calculating the GDP.

The accuracy and reliability of the method calculating the GDP depend on various factors:

- Data should be accurate, reliable and timely.
- Detailed data make control of data consistency easier.
- The quality of the data must be guaranteed.
- Data must reflect the actual production.

The input data for calculating the value added of agriculture comprises:

- Rice production
- Other crop production
- Livestock
- Fruit trees (estimate)
- Fish (estimate)

- Forest trees and forestry products
- Ten percent of the total gross output is added in the reporting system.

Calculating the GDP at constant prices

1. Agriculture 2. Industry 3. Services	**Product** (in kind)	X	**Coefficient of value added**	X	**Base price** (1990)	⇨	1
4. Import tax	**Product** (in kind)	X	**Coefficient of value added**	/ Price index		⇨	2

GDP at constant (1990) prices = 1 + 2

Calculating the GDP at current prices

1. Agriculture 2. Industry 3. Services	**Gross domestic product in 1990**	X	**Deflator** (inflation rate)	1	⇒	
			⇨			
4. Import tax				2		

GDP at current prices = 1 + 2

Session 5

Agricultural commodity and input reporting methods

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1. Introduction

There are many types of agricultural data, such as planted area, crop yield, crop and livestock production, production costs, crop and livestock prices, and information on marketing. These data are collected monthly and annually.

Their importance has been growing, as they are used for short- and long-term socio-economic development plans nationwide, especially the agriculture and forestry sector development plan.

The purpose of agricultural output-input price data collection is to help farmers know that the farm-gate price is fair or profitable for crop and livestock production. If the farm-gate price is not profitable, the government has to find the appropriate solution to help the farmers right away, thus the farm-gate price is an incentive for farmers to increase their production.

For marketing analysis purposes and to reduce errors in price data, there should be at least five or ten years' worth of data. Price fluctuations can help farmers determine which produce may be profitable over a given season, even though they are wont to prefer to grow crops and raise livestock or poultry that fetch constant prices.

Data collection methods must be appropriate; their principles should be uniform and easy to grasp and the technical words used should be explained in simple terms so that all enumerators can understand them. This will help limit errors in data collection. Standards of data collection on price for each district and each province of the country must be uniform.

2. Agricultural produce and input prices

2.1. Definition of terms

Farmer price, also known as **producer price**, is the price received by the farmer/producer on the farm (**farm-gate price**) when he sells his produce.

Input price: Refers to the price paid by the farmer for the **inputs** (fertilizer, seeds, etc) he needs to grow a crop.

Market/Marketplace: Not necessarily a set location within solid walls where goods are bought and sold day in day out or on specific days, but rather any place where goods change hands either through sale or through barter.

Livestock price: The price of living domestic animals (buffalo, cattle, pigs, etc) expressed in kilograms. When buyers and sellers do not know the actual weight of the animal involved, the enumerator can still assess it by comparing the size of the animal with that of other animals of the same species and condition whose weight is known. Lao farmers traditionally count animal size in *kum*. (NB: One *kum* equals 32 kg for buffalo, but 23 kg for cattle and 16 kg for pigs. The ratio of fresh meat to body weight is 33 percent for buffalo, 48 percent for cows and 70 percent for pigs.) If a buffalo of 9 *kum* is sold for 650 000 kips, then its weight is 9 x 32 = 288 kg, which means that its livestock price is (650 000 : 288) 2 256 kips per kilo.

After the monthly prices are collected in each market or representative village, adding the prices in each market and dividing the total by the number of markets will give the average price for the month. For instance, if the prices of coated dry-season sticky rice in five villages are 190, 185,170,175 and 180 kips, then the average price is 190+185+170+175+180 : 5 = 180 kips.

2.2. Data items

The agricultural produce and input prices collected are presented below. Variations of prices within a district or within a province are not important and need not be collected. If any goods not listed in the table are important commodities in a district or a province, a special collection is called for. All items are measured in kilograms, except for live duck and free-range chicken, which are counted per head.

Rainfed non Œ-glutinous paddy	Kg
Rainfed glutinous paddy	Kg
Irrigated non-glutinous paddy	Kg
Irrigated glutinous paddy.	Kg
Upland glutinous paddy.	Kg
Upland non Œ-glutinous paddy.	Kg
Maize.	Kg
Soybeans.	Kg
Peanut.	Kg
Coffee.	Kg
Mungbeans.	Kg
Sesames.	Kg
Live Buffalo.	Kg
Live Cattle.	Kg
Live pig.	Kg
Live Duck.	Kg
Broiler Chicken.	Kg
Free range Chicken.	Kg
Chicken eggs.	Kg
Duck eggs.	Kg

Fertilizer.

Urea.	Kg
Amosfost 16-20-00	Kg

Insecticide.

Furadan.	Kg
Diasenol.	Kg
Cevin.	Kg

2.3. Scope of the price survey

The agricultural output and input price survey covers the whole country, including urban areas. The survey covers only the agricultural activities of private households; agricultural activities undertaken by government organizations, businesses, etc, are excluded. The main statistical unit for the survey is the agricultural holding.

2.4. Sample design and selection

Purposive or judgemental selection is used. Samples are selected using the two-stage sampling method: a sample of villages (market) is first selected in each district, then a sample of households (producers) for each sample village. Agricultural holdings are identified by asking each sample household about its produce and input prices.

In most districts, a sample of three to five villages is taken, with an average of five households selected in each sample village – i.e. 15-25 sample households in each district.

2.5. Duration of the data collection

2.5.1. At district level

The agency responsible for the collection of agricultural price data is the agriculture and forestry district office (the enumerators are government employees from the district). Data collection is undertaken twice a month, on the first and fifteenth of every month. On the twentieth of the month, the district must submit its report to the province, using Form 1.

2.5.2. At provincial level

The agency responsible for the compilation and dispatch of agricultural price data is the agriculture and forestry provincial office. Produce and input prices are sent to the Statistics Division of the Planning Department in Vientiane for computer processing. Before the report is submitted to the Ministry of Agriculture and Forestry, the provincial staff must check, analyse and explain changes in price in the allotted space of Form 3.

3. Field operations

Provincial employees of the Ministry of Agriculture and Forestry act as field supervisors for data collection in each district. Their task is to select the purposive sample market in each district with the help of the trade district office, select the sample household in each sample market with the help of the village chief, and visit each sample household to collect the produce and input price data, using Form 1. If the sample village or sample household is not selling or buying produce or input, the enumerator moves to the next village or household.

4. Filing and reporting

Form 1 (using two sets a month) is for reporting prices each month to the provincial office of the agriculture ministry. The average prices collected on the first of the month are written down in Cell 1, those collected on the fifteenth of the month in Cell 2, and Cell 3 is for the average for the month (Cell 1 plus Cell 2 divided by 2). Explanations of purchase conditions or price status within the district are given in the fourth cell.

Form 2 is used to record average monthly prices of each kind of goods over a period of several months, at the district and province levels. The average prices of Cell 3 of Form 1 are transcribed each month and their average over a given period is calculated by dividing the total by the number of months. For instance, unhusked sticky rice is bought and sold for only ten months a year, so the average purchase price is obtained by dividing the total amount of monthly average prices by ten.

Form 3 is the summary form derived from Form 1 as reported by each district. There are two sets: one is kept for the record, the other is sent to the ministry.

Form 4 is used to report and coordinate the data at district level. Cell 1 is for the means of the price in the same month of the previous year. Cell 2 is for means of last month prices in current month. Cell 3 is for means of prices in current month. Cells 4, 5 and 6 are for data analysis for report to the higher level.

Session 6

The livestock marketing information system

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ALA/96/96/19

DESIGN AND COLLECTION OF LIVESTOCK DATA

Agricultural commodity price records

Scope to intensify livestock production:

1. Increasing farm income from livestock production
2. The Lao PDR is in a unique position in the regional livestock trade
3. ASEAN free trade introduction in 2003

Present recorded information

1. Livestock prices
2. Main crop commodity prices
3. Other input prices (fertilizers & insecticides)

Need for extra livestock information

1. Profitability depends on costs of inputs (feeds) and livestock prices
2. Intensified livestock production uses more feeds (extra costs)
3. Livestock and feed prices need to be recorded more fully

Feed intake is the key to livestock productivity

Commercial compound feed prices

1. Mainly used by emerging intensive pig & poultry system
2. Mainly used in Vientiane province
3. Strategic use in semi-intensive system (e.g. rearing period)

Other feed raw materials

1. Local use by farmers
2. Use by feed plants to produce compound feeds
3. Mini-feed plants producing concentrates (example):
   - using locally available maize and rice bran
   - with soybean extract and mineral-vitamin mix

Need to have additional information on feed prices

1. Commercial feeds for poultry (starter, broiler and layer)
2. Commercial feeds for pigs (starter, grower, fattener and breeding)
3. Feed raw materials (maize, rice-bean, dried cassava, soybean, fish meal)

Market prices are the key to profitability of the livestock system

Current data collection on livestock prices

1. Live buffalo, cattle, pig, broiler chicken: per kg
2. Live duck and free-range chicken: per head
3. Chicken and duck eggs: per kg

Considerations to improve price collection of cattle and buffalo

1. Large increase in production achieved by slaughtering animals in good body condition
2. Measure live weight (training in estimation and actual weighing at slaughterhouses)
3. Grade animal body condition before slaughtering (good, average and poor)

Considerations to improve price collection of pigs

1. Pigs are often offered for sale or slaughter at relatively light weights
2. Considerable price variations of younger weaned pigs in rural markets
3. Price per kg/live weight requires weighing and recording of market live value

Considerations to improve price collection of eggs and poultry

1. Differentiation local and farm eggs (standardization: number of eggs per kg)
2. Price of free-range chicken and duck to be calculated in the same way as for broiler chicken: price per kg live (this requires weighing and recording market live value)

LAO-EU LIVESTOCK PROJECT PRESENTATION: THE LIVESTOCK MARKETING INFORMATION SYSTEM

Slaughterhouse Monitoring Investigation (Buffalo and Cattle)

Much higher meat production can be achieved when animals are slaughtered in good body condition. Extension packages should aim at having animals in better body condition before slaughter by

- better health care (vaccination and controlling parasites) and
- better feeding (pastures/fodder and additional feeds).

The example below (see next page) shows an increase in meat production of 40 percent achieved by improving body condition. Ecological sustainability is better achieved by increasing the productivity per animal than by increasing the number of livestock that graze free-range.

SLAUGHTER HOUSE MONITERING PROJECT ALA/96/19

Objectives

1. COUNT, WEIGH AND GRADE SLAUGHTER BUFFALO AND CATTLE
2. CARCASS ANALYSIS TO DETERMINE

SLAUGHTER STUDIES AT SIX ABATTOIR LOCATIONS

VIENTIANE
PHONSAVAN
LUANG PRABANG
THAKEK
SAVANNAKHET

EQUIPMENT NEEDED AT EACH ABATTOIR TO WEIGH ANIMALS AND CARCASS MEAT

1. ELECTRONIC WEIGHING CRATE
2. PLATFORM WEIGHING SCALE (ABOUT 250 KG CAPACITY)
3. CONTAINERS TO WEIGH MEAT

GRADING OF BUFFALO AND CATTLE FOR EACH MATURE ANIMAL

1. GOOD
2. AVERAGE
3. POOR

CARCASS COMPOSITION MEASURES BUFFALO AND CATTLE

1. LIVE WEIGHT BEFORE SLAUGHTER (KG)
2. CARCASS WEIGHT SLAUGHTER (KG)
3. TOTAL STRIPPED CARCASS MEAT (KG)

EFFECT OF LIVESTOCK GRADE ON MEAT YIELD (CATTLE)

1. GOOD - MEAT YIELD 65 KG
2. AVERAGE - MEAT YIELD 50 KG
3. POOR - MEAT TIELD 37 KG

MEAT YIELD FROM 100 ANIMALS OF EACH GRADE

GOOD – 65 KG x 100 = 6 500 KG
AVERAGE – 50 KG x 100 = 5 000 KG
POOR – 37 KG x 100 = 3 700 KG

ESTIMATED MEAT YIELD FROM 100 YELLOW CATTLE BEFORE EXTENSION PACKAGES

GOOD @10% (10x65 KG) = 650 KG
AVER. @20% (20x50 KG) = 1 000 KG
POOR @70% (70x37 KG) = 2 590 KG

ESTIMATED MEAT YIELD FROM 100 YELLOW CATTLE WITH EXTENSION PACKAGES

GOOD @ 70% (10x65 kg) = 4 550 kg
AVER. @ 20% (20x50 kg) = 1 000 kg
POOR @ 10% (70x37 kg) = 370 kg

TOTAL MEAT 5 920 kg

Session 7

The collection of agricultural statistics in the provinces

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Executive summary

I General

In the Lao People's Democratic Republic, agriculture and forestry is the main battleground for socio-economic development, which aims to uplift the living conditions of not only the people active in that sector but society as a whole.

Agriculture and forestry statistics are an important component of the information required for planning and making decisions required to achieve this objective.

II Source of statistical information and responsible entities

At central level, the National Statistics Centre of the State Planning Committee collaborates closely with the Department of Planning of the Ministry of Agriculture and Forestry to follow up on statistical operations and jointly plan various activities designed to improve the national statistical system.

The Division of Statistics within the Department of Planning of the ministry of agriculture works with the planning and statistical sections of each provincial agriculture and forestry service nationwide. The division plays an important role in the area of agriculture and forestry data collection and processing.

The present summary is a distillation of the statistical data collection reports submitted by six provincial agriculture and forestry services, namely those of Vientiane Municipality and of the provinces of Vientiane, Luang Prabang, Savannakhet, Khammouane and Champassak.

III Availability of agriculture and forestry data

According to the reports submitted by the six provinces; the agriculture and forestry data available cover the following areas:

- planted area of all crops; yield and production;
- irrigation; dry- and wet-season irrigated areas;
- irrigation schemes and their transfer to local communities;
- all types of animal husbandry and vaccination;
- land and forest allocation;
- tree nurseries and crop plantations;
- price of agricultural commodities and other information; and
- others.

IV Data collection methods

1. Vientiane Municipality

Every Wednesday, the agriculture and forestry service of the Vientiane Municipality holds a meeting with the agriculture and forestry offices of the nine districts, projects, centres and stations affiliated with the division. The meeting listens to reports on agricultural production during the previous seven days, such as status of agricultural production in the season, rice transplantation, crop pests, floods or droughts, then draws up plans for the next seven-day period.

The employees of the agriculture and forestry service of the municipality who are sent to support production at the grassroots collect the data from reports from the village heads and from district reports which sum up the production data of each village and production zone.

Data on rice production are collected twice a year: once in the wet season and once in the dry season. The staff working in the nine agriculture and forestry offices collect the data within their area of responsibility then pass them on to the agriculture section, which, together with the statistical unit of the provincial agriculture and forestry service, processes the data and presents them in an evaluation report.

The employees of the nine districts are trained by the agriculture ministry on how to collect and report data on agricultural commodity prices. The data are sent to the agriculture and forestry service of the municipality before being submitted to the ministry.

Besides the above-mentioned data collection, the service also collects data and observes vegetable price fluctuations in the four main markets of the municipality. Some data on agricultural imports are also collected.

2. Vientiane Province

Data availability and data collection methods are similar to those of the Vientiane Municipality.

3. Luang Prabang Province

The agriculture and forestry office of Luang Prabang Province collects data on crops, livestock, fishery, forestry, irrigation, meteorology and hydrology, as follows:

Crops Total area, planted area, fallow land, damaged area; flood, drought, pests; production, yield. The information includes wet-season rice and crops, irrigated paddy and dry-season crops

Livestock Livestock statistics (elephants, buffalo, cattle, pigs, goats, sheep and poultry); vaccination of each type of animal; number of village veterinary volunteers; production of fish fingerlings for the village

Forestry Seedlings in nursery

- Forest exploitation
- Forest and land allocation
- Number of villages
- Reserved forest
- Protected forest
- Production forest
- Forest in use
- Arable land

Irrigation Number of schemes; permanent; gabions, brushwood weirs; irrigation area (wet and dry seasons); numbers and size of water pumps

Meteorology and hydrology Climate, waterfall, sunshine hours, wind velocity and water level (including water quality samples sent to laboratories)

Data on some agricultural commodities are also collected in marketplaces.
The data are collected in two ways:

- A village committee in charge of economic affairs provides production information on the

village to the agriculture and forestry office and the district administrative authority; then the district agriculture and forestry office collates and sums up the information and submits it to the agencies concerned, such as the statistics section of the provincial agriculture and forestry service. Sometimes a staff member of the district agriculture and forestry office goes to the villages to collect data.

- Or else, the relevant staff (for crops, livestock, fishery, forestry, irrigation and meteorology) together with employees of the district agriculture and forestry office go and interview farmers to collect data on their production area, which are processed at district level before being passed on to the province.

4. Khammouane Province

Agricultural statistical data are collected annually at district level.

- Data on crops are presented according to the production season by type and by district, showing area, yield and production.
- Data on livestock and fishery are classified by animal type and by district, showing the number vaccinated, number of deaths from disease, animal movement in and out of the province, number of farms keeping animals, animal type and numbers.
- Forestry data are classified into categories which include area, land and forest allocations by district.
- Other information, such as forest exploitation and non-wood forest products, is presented by district.
- Irrigation data are presented according to project area, location, scale; engine power; whether irrigable in wet or dry season. The water level is measured in the Mekong River and its main tributaries in order to be prepared for flooding at peak season, with morning and afternoon reports.

There is some other information similar to that of other provinces.

Agricultural and forestry data are from surveyed data and are based mostly on reports from the district agriculture and forestry offices, which report weekly, monthly and quarterly. The line agencies of the provincial authority also provide some information. From this year on, the district agriculture and forestry personnel meet every twenty-fifth of the month to gather statistics and process them into an animal provincial statistical report.

5. Savannaket Province

The data collected is published in the following ways:

1. A long-term agricultural statistics bulletin with twenty-, ten- and five-year ranges sums up annual data divided into district and location (plain and mountainous area) and presenting population growth, production area, yield and production of each type of crop, development of various types of animals, tree nursery and plantation, natural conservation, water resources development, and climatic change.
2. An annual statistical bulletin started in 1997 presents the status of production with production area, yield and production of each type of crop, development of livestock, tree

nursery and plantation, forest reserve, water resources development, climate, land and forest allocation, and more.

Commodity prices and agricultural input data are collected at district level twice a month (midmonth and at month end) and cover wet-season paddy price, dry-season paddy price, upland paddy price, maize, soybean, live buffalo, live cattle, live pigs, ducks and free-range chickens, chicken eggs, duck eggs, fertilizers, pesticides, fish, chilli, rice bran and others.

Meteorological and hydrological data are collected from the relevant section of the district and of the province and cover rainfall, temperature, level of the Mekong River and tributaries, humidity, wind velocity, sunshine, evaporation and more.

Area data are reported by the village head, who interviews each farming family in order to calculate the annual land tax, whereas the data on production area are reported by the farmers' group in an irrigated area, which is measured for the collection of the water fee. Areas of garden and upland rice are estimated by observation and from the quantity of seed used during a season.

Yield data are collected through surveys carried out by the agricultural staff of each district. There is a variation in the survey method. The survey of each type of paddy at early, medium and late maturity is done through the sampling of three plots (fertile, medium and infertile plots). After selecting the location, a representative plot is established with a size of 1m x 1m ($1m^2$). Humid paddy is weighed and the weight of dry paddy is estimated through the formula: dry weight = (humid weight x 75) : 86. In some cases, however, the representative plot measures 2m x 2m ($4m^2$) and the paddy is dried, with a standard humidity of 14 percent when weighed.

Data on annual livestock development are calculated by the provincial livestock and forestry sections through methods defined by the Department of Livestock. Ditto for meteorological and hydrological data and the relevant department.

6. Champassak Province

Data available

- Number of farmer households
- Forestry area, irrigated paddy area, upland rice area
- Planted rice area, organic and inorganic fertilizer use
- Area loss from natural calamity: flood, drought, pests
- Planted area of other crops such as coffee: new plantation, early maturing plots, stemming, fruiting, plots, yield, production, planted, area loss of cardamom, tea, castor bean
- Planted area of beans: soybean, mung bean, black bean, groundnut
- Fruit crop area: durian, choko, vegetables
- Root crop area, sugarcane, tobacco leaves and others

Livestock and fishery

- Number of livestock in each district such as buffalo, cattle, elephants, pigs and goats, and fishponds
- Vaccination: buffalo, pigs and poultry
- Number of livestock: for domestic consumption, number of deaths from disease, number exported overseas and to other provinces, and others

Irrigation

Number of gravity-fed weir sites in the province, number of electric water pumps, of fuel-powered water pumps; number of reservoirs in the province, designed and actual irrigated areas

Forestry and environment

Number of villages undergoing land and forest allocation; recruitment of village forestry staff, number of nurseries, seeds collected, plantation, rehabilitation, volume of timber exploited, non-wood forest product harvest for export

Data collection method within the province

The personnel in charge at the provincial level design data collection sheets as required, which are distributed to the five sectors involved in the ten districts of the province for uniformity of reporting.

The district employees in charge collate and sum up the data collected and enter them into a conventional report which is submitted to the head of the unit for approval before being sent on to the province.

The provincial staff collate the reports from the districts, check the accuracy of the data submitted and produce a provincial statistical report which is submitted to the provincial head for approval before being forwarded to the ministry. District reports must be submitted to the province twice a year, on 15 May and 15 December.

V Constraints

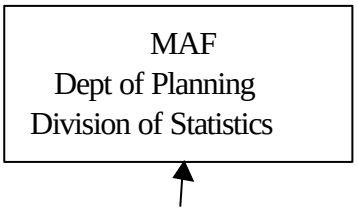
- The data collected for processing into some statistical reports are not sufficient; thus, some information is missing.
- Data collection sheets are not standardized and may not comply with those of other provinces.
- Statistical data collected refer only to quantity and do not reflect the productivity or quality of a produce.
- Budget is lacking to support data collection by staff in the villages.
- Data collection for agricultural commodity prices done twice a month cannot give up-to-date information and reporting is not continuous.
- Area estimates are done from the seedbed preparations of farmers or by asking tractor drivers, thus are seldom accurate.
- There is a lack of personnel for data collection, a lack of equipment, including for communication and transport, which restrains the ability to travel and hampers statistical coverage over wide areas.

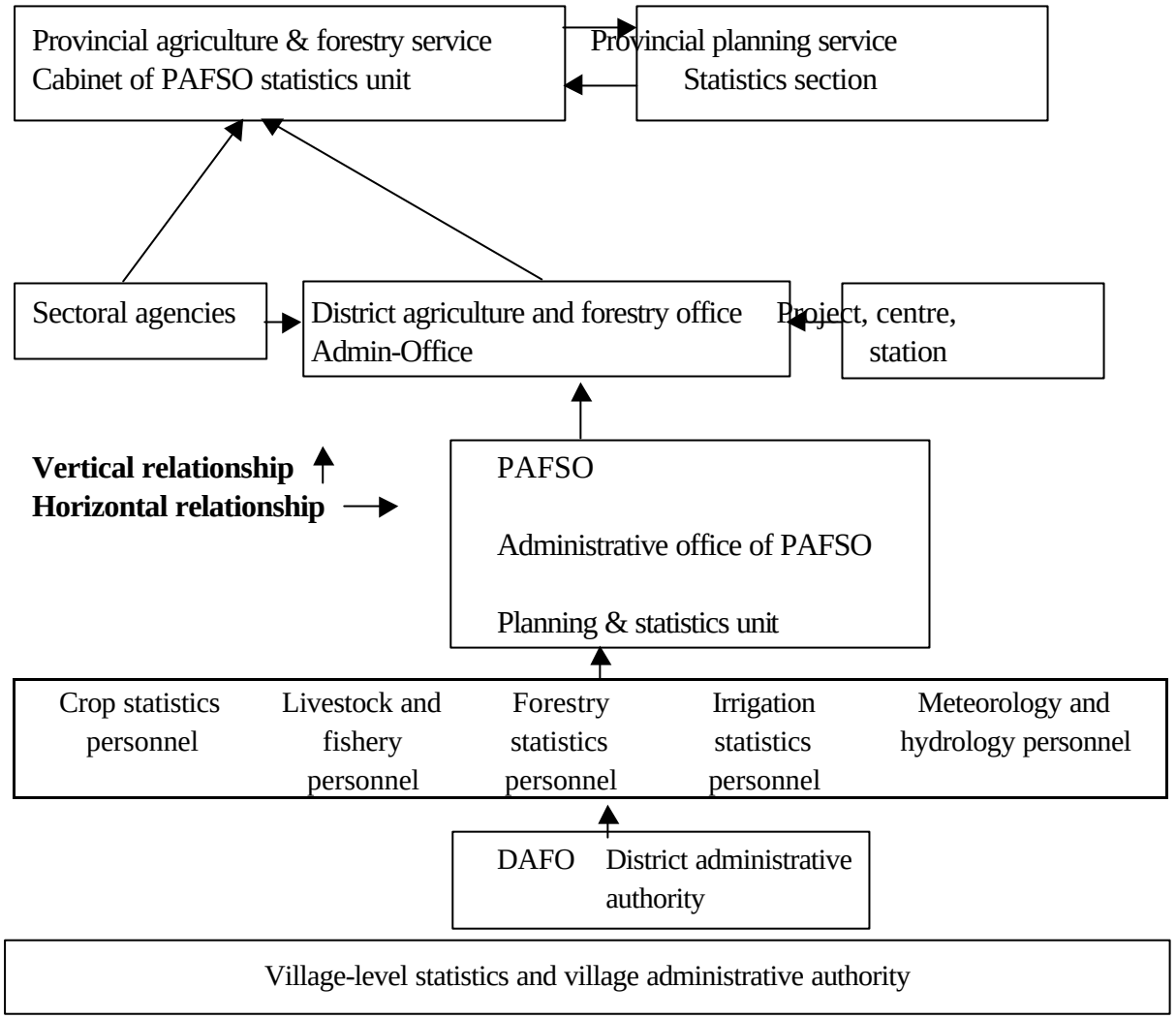
- Some village heads do not provide the information required and cannot evaluate or analyse.
- Data are collected regularly but not thoroughly enough, especially data on upland rice area, which cannot be classified into categories such as nomadic upland rice, rotational shifting cultivation or permanent upland rice.
- Data on agricultural inputs or investment cannot be collected, even from private sources or the farmers themselves.
- Data on the natural or socio-economic potential for agriculture and forestry development are not sufficient.
- There is a lack of estimation of GDP in agriculture at provincial level to facilitate planning projects at that level.
- The capability to process data by using computer facilities is lacking.

VI Recommendations

- Training on data collection is required for personnel at all levels.
- Provision of adequate equipment, vehicles and other facilities for statistical data collection is required.
- Line agencies should agree on the design of data collection sheets.
- New employees with no background on statistics should be trained forthwith.
- The statistical network at village level needs to be improved.
- Agricultural information should be broadcast among the farming community in a timely manner.
- The role and responsibilities for statistical action of the district and provincial agriculture and forestry services need to be further defined, and statistical personnel need to be recruited in agriculture and forestry district offices.
- Overlapping in data collection among provincial agencies must be avoided; the division of labour among those agencies regarding statistics should be clearly defined.
- Statistical workshops need to be organized at least once a year at provincial and regional or national levels to improve performance.

VII. Organizational structure of line agencies in charge of statistics at provincial level




Provincial agriculture & forestry service
Cabinet of PAFSO statistics unit
Provincial planning service
Statistics section
Sectoral agencies
District agriculture and forestry office
Admin-Office
Project, centre,
station
Vertical relationship
Horizontal relationship
PAFSO
Administrative office of PAFSO
Planning & statistics unit
Crop statistics personnel
Livestock and fishery personnel
Forestry statistics personnel
Irrigation statistics personnel
Meteorology and hydrology personnel
DAFO
District administrative authority
Village-level statistics and village administrative authority