



**METADATA FOR
NATIONAL AGRICULTURAL STATISTICS**

CAMBODIA

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List of Acronyms

AMO	Agricultural Marketing Office
AFSIS	Asian Food Security Information System
BOP	Balance of Payment
CPI	Consumer Price Index
CED	Customs and Excise Department
CDC	Council for the Development of Cambodia
CIF	Cost Insurance Freight
COM	Commune
DPS	Department of Planning and Statistics
DoA	Department of Agronomy
DAHP	Department of Animal Health and Production
Dis	District
FAO	Food and Agriculture Organization
FOB	Free on Board
GDP	Gross Domestic Product
GVA	Gross Value Added
HH	Household
IMF	International Monetary Fund
MAFF	Ministry of Agriculture Forestry and Fisheries
MoP	Ministry of Planning
MEF	Ministry of Economy and Finance
NSS	National Statistical System
NIS	National Institute of Statistics
NBC	National Bank of Cambodia
NA	National Account
PDA	Provincial Department of Agriculture
PSO	Provincial Statistics Office
PMG	Priority Mission Group
Pro	Province
PPS	Probability Proportional to Size
SRS	Simple Random Sampling
Vil	Village
WFP	World Food Programme

CHAPTER 1. NATIONAL SYSTEM OF AGRICULTURAL STATISTICS

1.1 Legal Framework and Statistical Advisory Bodies

The basic legal framework for national statistical system (NSS) now is in place, with the enactment of Statistics Law in May 2005. The Statistics Law provides legal power to National Institute of Statistics (Representing the national statistical body) and statistics units within the government agencies to collect, process, compile, analysis, publish and disseminate statistical data pertaining to the whole Kingdom of Cambodia. By Statistics Law, Statistics Advisory Council (at the policy maker levels from line ministries) and Statistical Coordination Committee (at the technical levels from line ministries) were formed to strengthen and support the official statistics. However, a number of provisions to strengthen the independence of official statistics and the autonomy of the NIS have not been included. The lack of actual, and more importantly perceived, independence of official statistics and the autonomy of NIS will seriously undermine the trust of data providers and respondents, as well as the credibility of these statistics amongst the Cambodian and international user community.

The lack of autonomy or independence from government ministries is expected to undermine the level of cooperation and the trust of respondents that their individual information will be kept confidential, resulting to be at least a provision for independent reporting by the NIS and the statistics Advisory Council to the Council of Ministers and the National Assembly via the Ministers of Planning. It is recommended that a provision for independent reporting be included in the Statistics Law or alternately that the independence provisions be retained in the Statistics Law. Furthermore, the confidentiality, secrecy, and non-compliance as well as the associated penalty provisions in the draft Law are not prescriptive as they need to be. It is recommended that these provisions be strengthened or alternatively that detailed and prescriptive technical support via the IMF MSA is required. However, it should be noted that the Statistics Law in itself is not enough and cannot be enforced without effective judicial reforms taking place.

Articles 22 and 25 of the Statistics Law required that all officers involved with statistical system must keep the confidentiality of information provided by survey respondents and respondents must provide accurate, complete and timely information to designated statistical officers of the National Institute of Statistics and statistical units of the Royal Government of Cambodia.

1.2 Structure and Organization of the Major Agricultural Statistical Agencies

The Cambodian Statistical System is highly decentralized, with NIS being the only statistical unit that has statistics as its sole function. In virtually all ministries and other institutions, the statistical activity is combined with other functions, such as planning, policy and program formulation and monitoring, research and analysis. Not

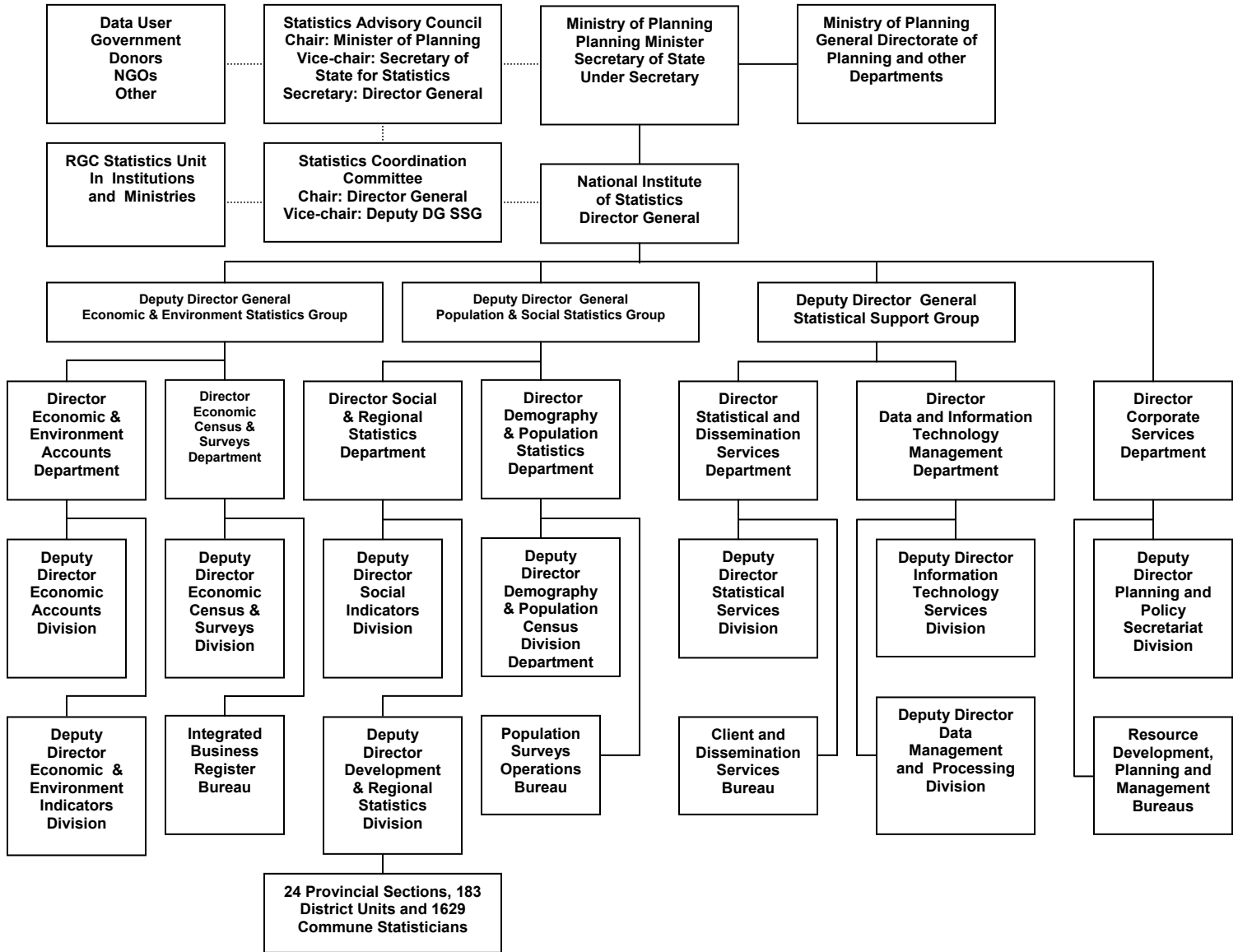
surprisingly, the statistics function is accorded a lower priority. The impact on the availability, reliability and quality of official statistics is significant.

The Statistics Office of DPS has a staff complement of 20. They are under direct supervision of DPI. There are 2-10 Planning and Statistics staff members at each Provincial Department. These provincial level planning and statistics staff belong to PDA. At district level, the responsibility of data collection is vested on the district staff assigned by the provincial office. Modest arrangements regarding data collection and compilation exist at commune and village levels.

In priority provinces, the responsibilities of provincial staff also include the following:

- Act as enumerators/supervisor in the sample survey enumeration;
- Assist in the selection of suitable enumerators for sample surveys and other data collection activities;
- Organize training of survey enumerators;
- Organize sample survey operation and management;
- Supervise primary data collection activities;
- Undertake preliminary check of sample survey data especially as regards i). quality of reported data, ii) completeness in reporting from all sampled households and iii) completeness in coverage for all data items covered by the survey;
- Perform editing and processing of the sample survey data and, if necessary, suggest revisit of sampled households with poor-quality data; and
- Collect data from grain mills and abattoirs.

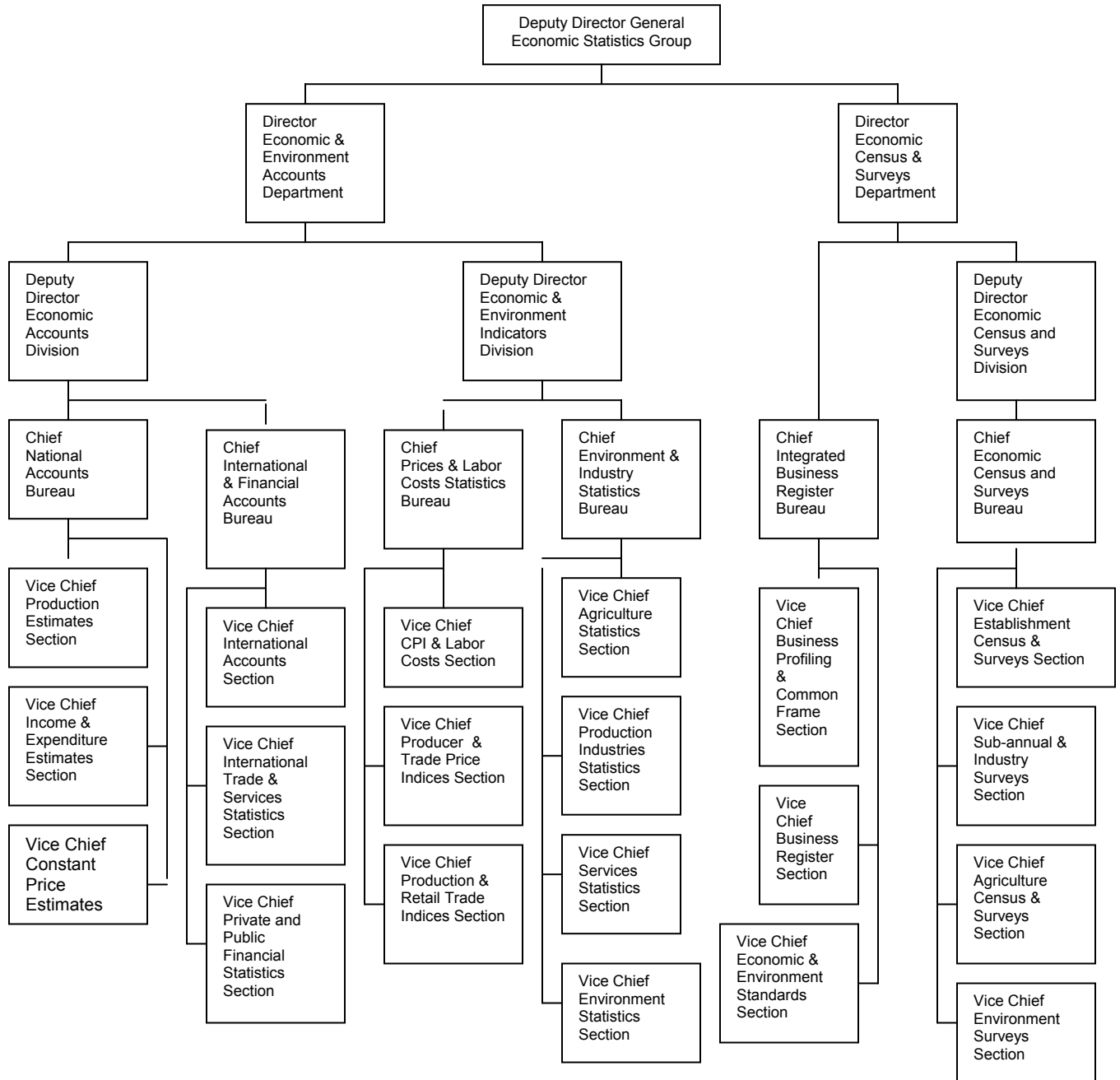
Top Level Organizational Structure



Senior Executives

Director-General = 1
 Deputy Director-General = 3
 Department Directors = 7
 Deputy Directors = 10
 Total = 21 (Ratio 1:100)

Organizational Structure of the Economic Statistics Group



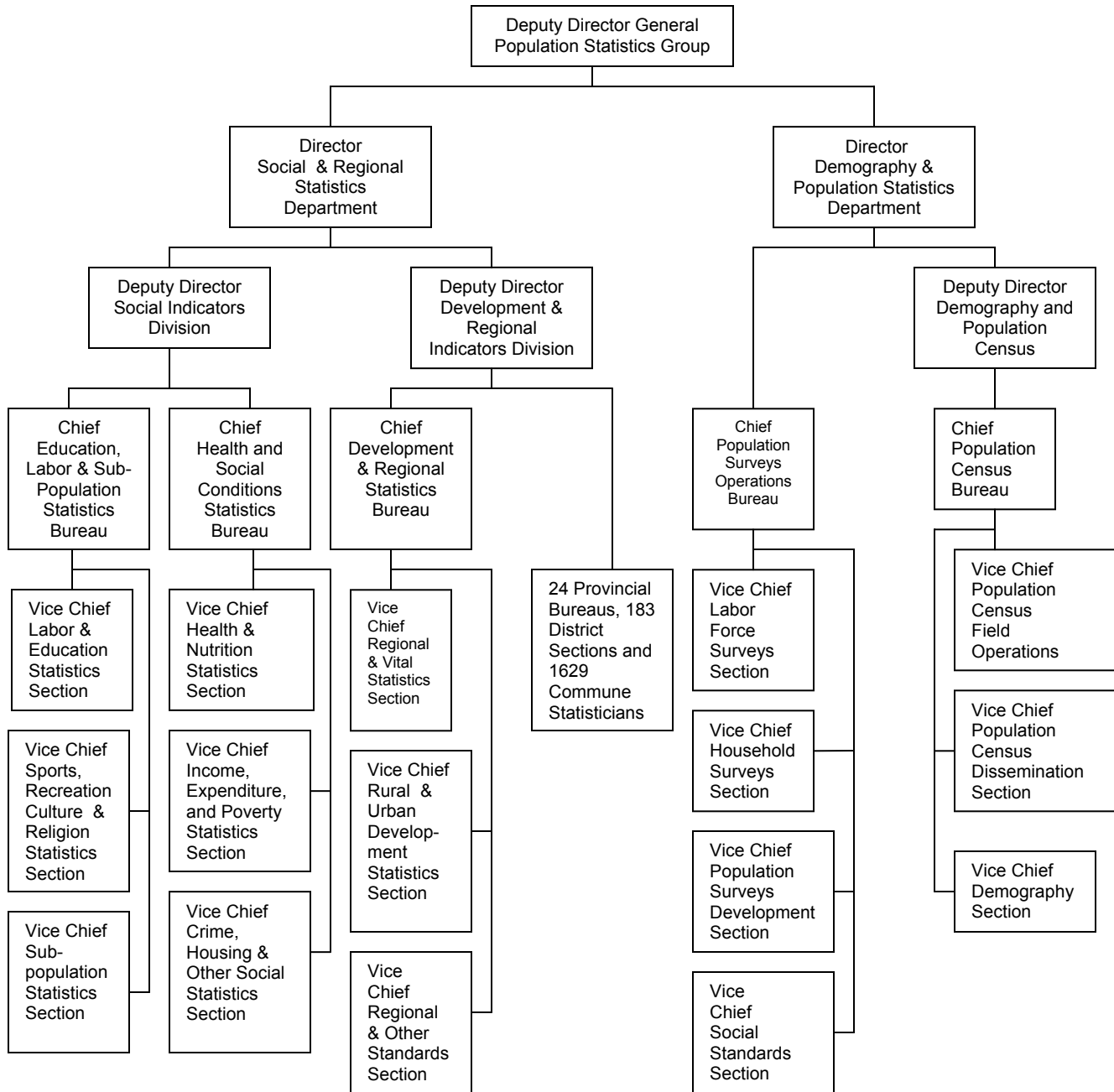
Executives

Chiefs = 6

Vice Chiefs = 20

Total = 26

Organizational Structure of the Population Statistics Group



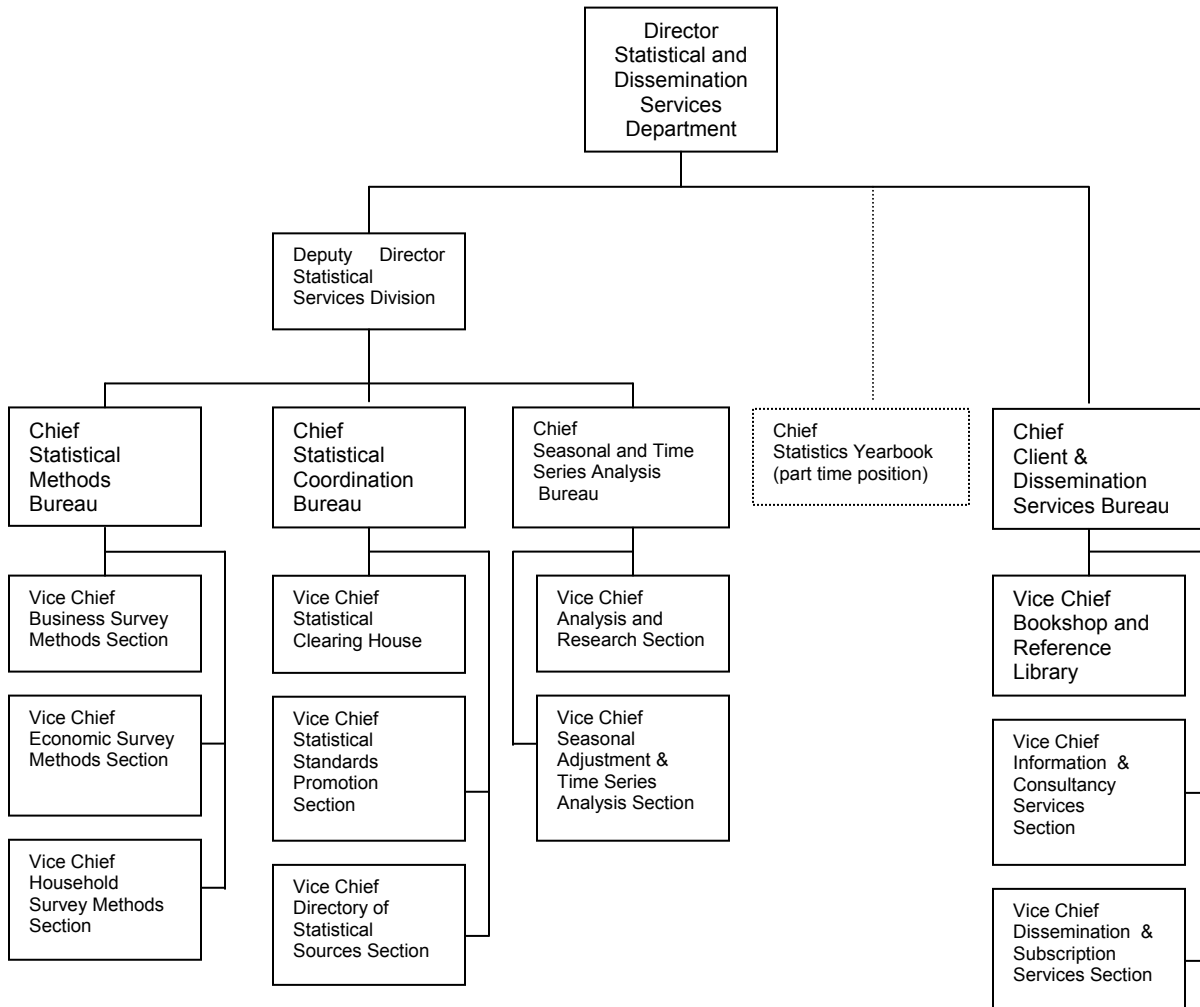
Executives

Chiefs = 5

Vice Chiefs = 16

Total = 21

Organizational Structure of the Statistical and Dissemination Services Department



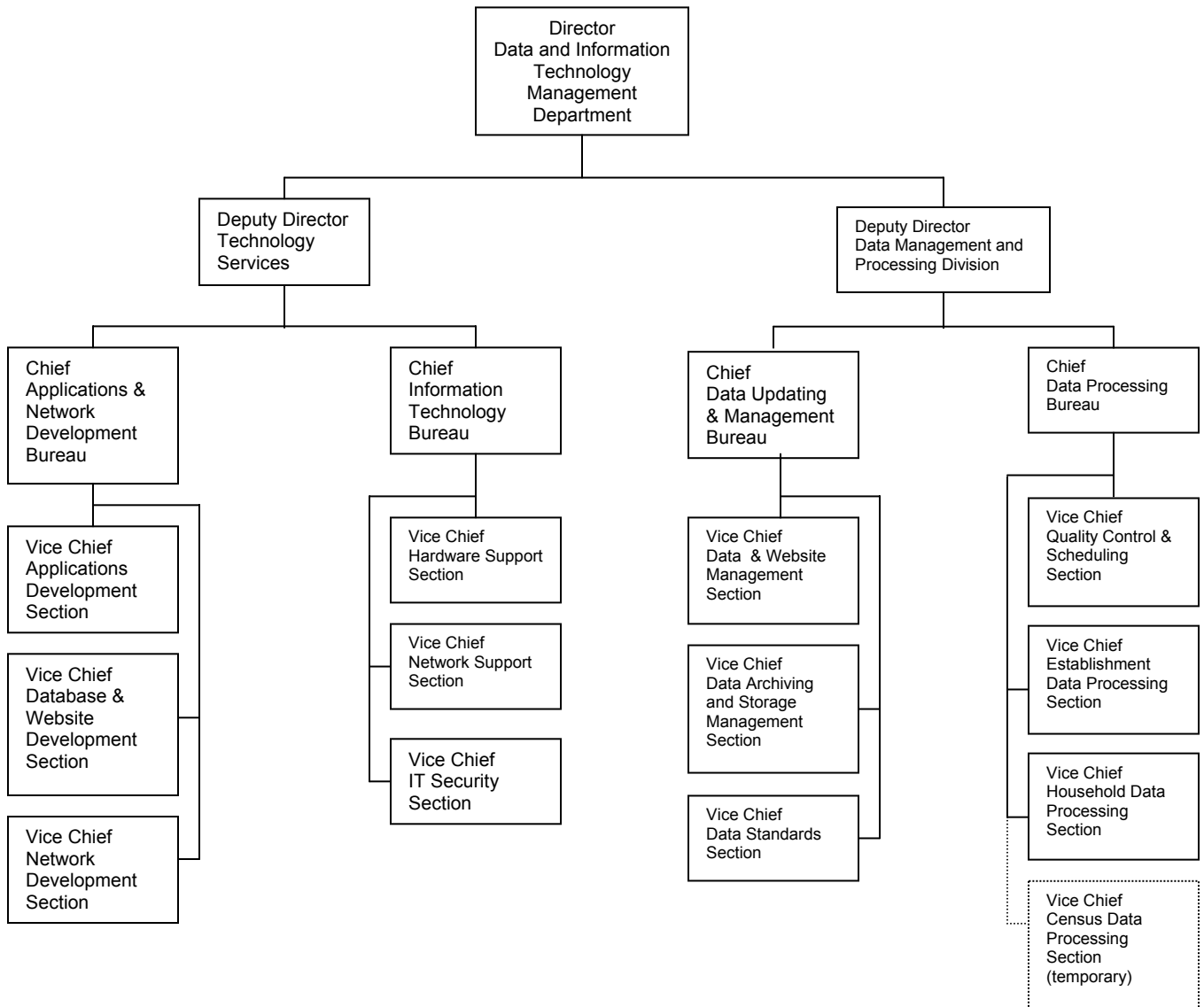
Executives

Chiefs = 4

Vice Chiefs = 11

Total = 15

Organizational Structure of the Data and IT Management Department



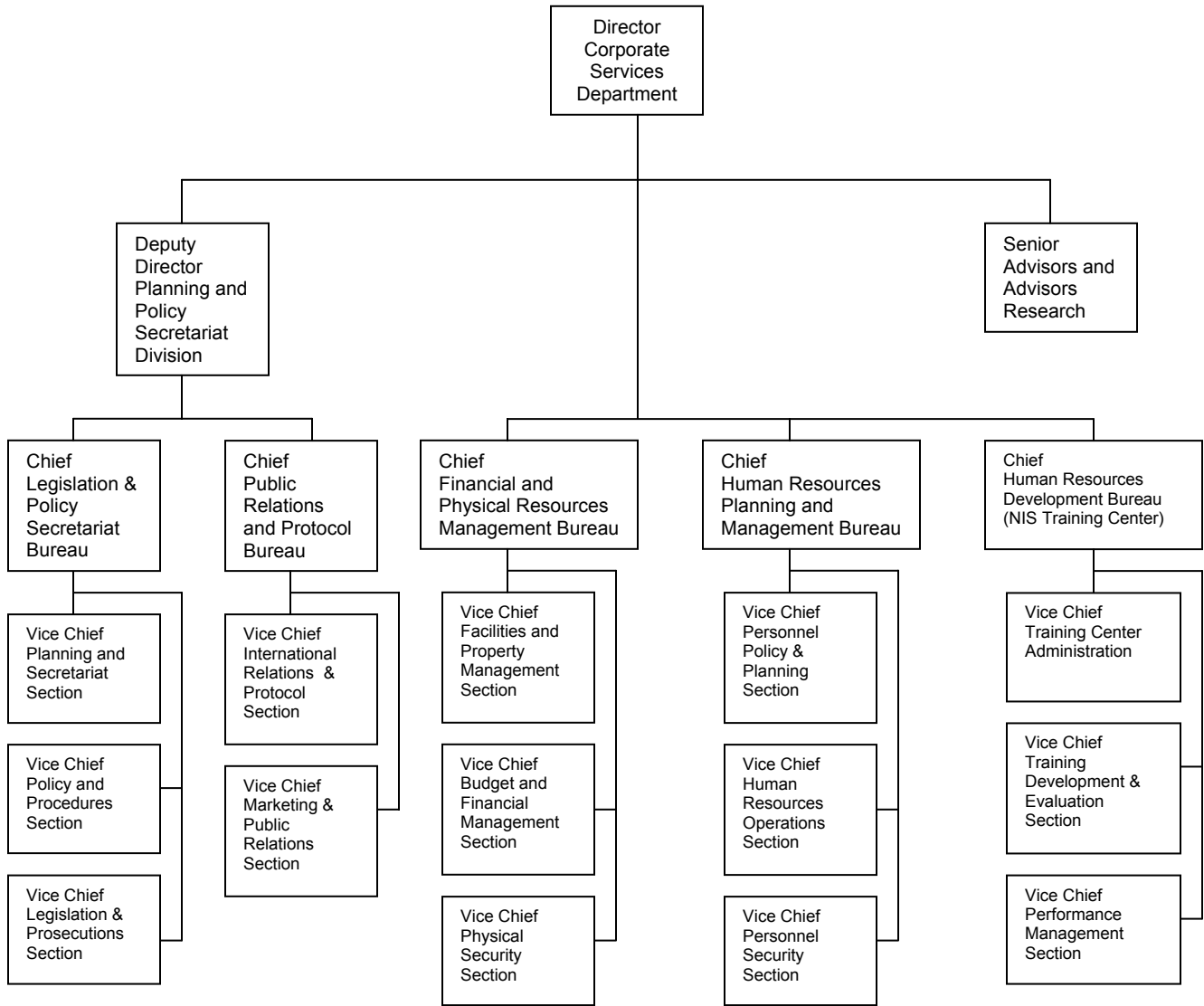
Executives

Chiefs = 4

Vice Chiefs = 12

Total = 16

Organizational Structure of the Policy and Resource Management Department



Executives

Chiefs = 5

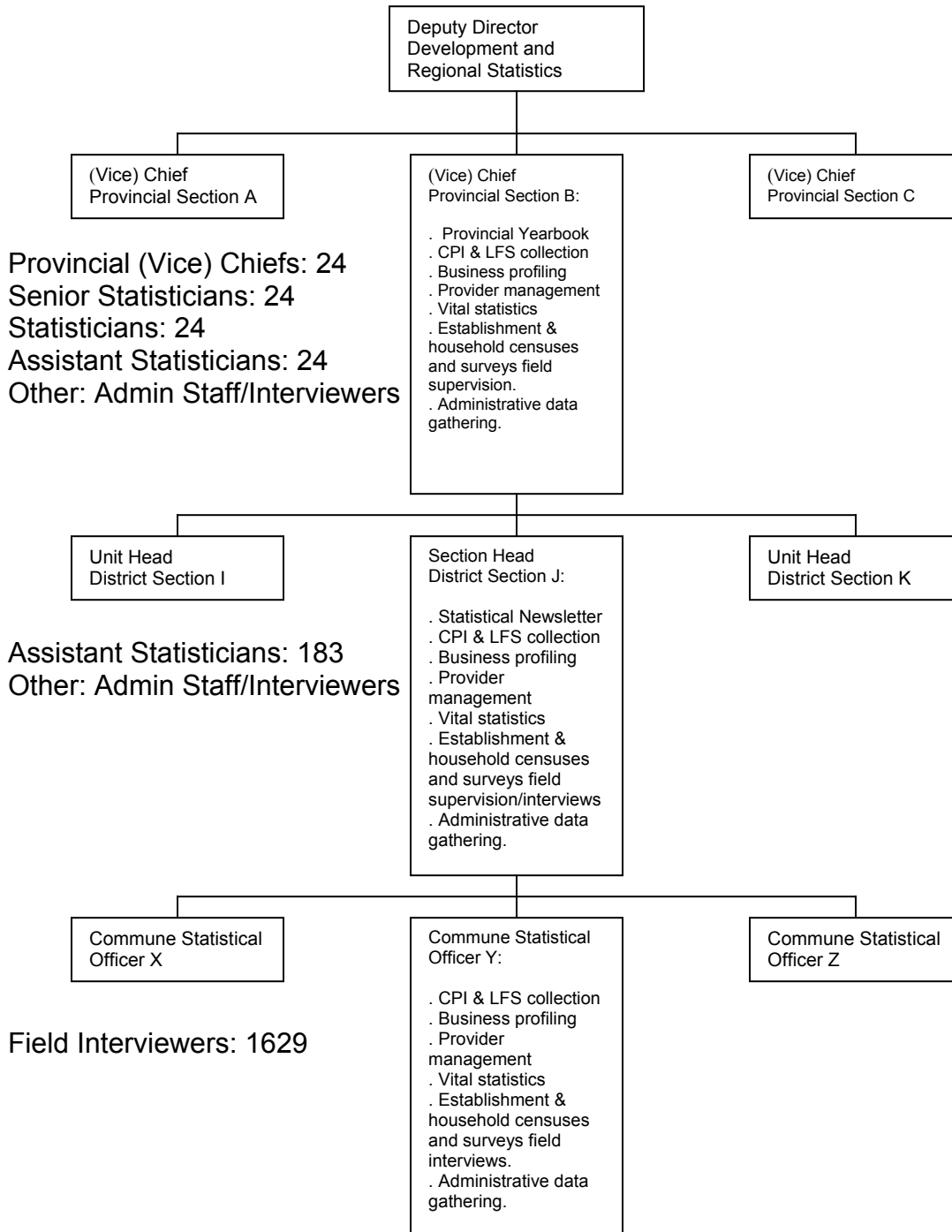
Vice Chiefs = 14

Total = 19

Senior Advisors = 0

Advisors = 0

Organizational Structure of Regional Offices



Executives

Vice Chiefs = 24

Total = 24

Advisory, Coordination and Management Forums

Statistics Advisory Council

(Total membership: 25)

Statistics Advisory Council

Chair: Minister of Planning
Vice-chair: Secretary of State in Charge of Statistics
Secretary/Ex-Officio: Director General, NIS
Other Members: 22 (Secretary of State or Undersecretary of State Level for RGC Members)
Council of Ministers;
Ministry of Agriculture, Forestry and Fisheries;
Ministry of Commerce;
Ministry of Economy and Finance;
Ministry of Education, Youth and Sports;
Ministry of Health;
Ministry of Interior;
Ministry of Rural Development;
Ministry of Tourism;
National Bank of Cambodia;
Asian Development Bank;
Food and Agriculture Organization;
International Monetary Fund;
United Nations Development Program;
UNESCO;
UNFPA;
UNICEF;
World Bank;
World Health Organization;
1 x Academia
1 x Business Association
1 x Non-Government Organization

Statistics Coordination Committee

(Total membership: 31)

Statistics Coordination Committee

Chair: Director General, NIS
Vice-chair: Deputy Director General
Statistical Support Group, NIS
Secretary: Deputy Director, Planning and Policy Secretariat Division, NIS
Other Members: 29 (Director or Deputy Director)
Civil Aviation Secretariat;
Council of Ministers;
Council for the Development of Cambodia;
Customs and Excise Department;
Ministry of Agriculture, Forestry and Fisheries;
- Department of Agriculture;
- Department of Fisheries;
- Department of Forestry;
Ministry of Commerce;
Ministry of Cults and Religion;
Ministry of Culture and Fine Arts;
Ministry of Defense;
Ministry of Economy and Finance;
Ministry of Education, Youth and Sports;
Ministry of Environment;
Ministry of Health;
Ministry of Industry, Mines and Energy;
Ministry of Information;
Ministry of Interior;
Ministry of Justice;
Ministry of Planning;
Ministry of Post and Telecommunications;
Ministry of Public Works and Transport;
Ministry of Rural Development;
Ministry of Social Affairs, Labor, Vocational Training and Youth Rehabilitation;
Ministry of Tourism;
Ministry of Urban Planning, Land Management and Construction;
Ministry of Veterans and Women's Affairs;
Ministry of Water Resources and Meteorology; and
National Bank of Cambodia.

MOP/NIS Annual Management Meeting

Ministry of Planning/National Institute of Statistics
Annual Management Meeting

Chair: Minister of Planning
Vice-Chair: Secretary of State in Charge of Statistics, MOP
2nd Vice Chair: Undersecretary of State, MOP
Secretary: Director General, NIS

Deputy Directors General, NIS
Department Directors, NIS
Deputy Directors, NIS
Bureau Chiefs

MOP/NIS Management Meeting

Ministry of Planning/National Institute of Statistics
Monthly Management Meetings

Chair: Secretary of State in Charge of Statistics, MOP
Vice Chair: Undersecretary of State, MOP
Secretary: Director, Planning and Resource Management, NIS

Director General, NIS
Deputy Directors General, NIS
Department Directors, NIS
Deputy Directors, NIS
Bureau Chiefs, NIS

NIS Department Heads Meeting

National Institute of Statistics

Weekly Department Heads Meeting (DHM)

Chair: Director General, NIS
Vice Chair: Deputy Director General, SSG, NIS
Secretary:
Deputy Director Planning and Policy Secretariat, NIS

Deputy Directors General, NIS
Department Directors, NIS

NIS Department and Group Meeting

Department/Group Meetings

Monthly Department/Group Meetings

Chair: Director or Deputy Director General

Department Directors
Deputy Directors
Bureau Chiefs
Vice Chiefs

The number of staff of PSO is 3-5, depending on the size of the province and activities. There is no PSO at district level agriculture offices.

The Chief of district office or a relevant technical staff prepares regular qualitative and quantitative reports on the agricultural situation in the district. The quantitative report of a district is based on the commune reports supplied by different communes in the district. A commune's report is based on the reports obtained from the villages in the commune. Data from villages to commune, communes to districts, and districts to province are transmitted on the date of monthly meetings. With the assistance of respective technical offices within PDA, regular reports from different districts are collated by PSO. PDA provides guidance in all of the operations mentioned above. PSO reports to DPS, PDA and technical departments (DoA, HAHP, etc.). Reports from provinces are used by DPS for summarization and presentation. In case of non-response (no reporting) from a province, DPS seeks assistance of PDA and the technical department.

The Statistics Office of DPS is responsible for data collection and presentation. It does not have mechanism to control the quality of data reported by PDA. Presently, it also does not have capacity to undertake sample surveys. Hence, its activities are rather limited to consolidation of reports and data obtained from various sources. The office generates agricultural data in the form of regular statistical reports and statistical publications. These reports are targeted for the use of MAFF and other government agencies.

Organization and Management of Data Collection in NIS

Most of NIS' agricultural data are based on the results of population census or on socioeconomic survey. The conduct of socioeconomic survey is the responsibility of the Economic Statistics Department of NIS. The department has conducted two such surveys with (grant) assistance from external donors.

The conduct of socio-economic surveys of NIS involves substantial number of local and international staff. For example, the latest survey in 1998 used 9 NIS core staffs, 92 field staffs, 16 manual data processors, 19 computer data processors, and 9 international staffs. Most of the supervisors and enumerators of the survey were from NIS, Ministry of Planning, and NIS provincial offices. Each local staff involved in these surveys received allowances.

All censuses and surveys conducted by NIS are almost entirely dependent on external grant or assistance. The arrangements made for such censuses and surveys are ad-hoc in nature. Without external assistance, NIS is not in a position to conduct censuses and socioeconomic surveys on regular basis. Its main constraint in this regard is lack of financial resources.

The General Statistics Department of NIS collects data and information relevant to Commodity Price Index of Phnom Penh. Such data are presented in a monthly NIS publication entitled Consumer Price Index.

Institutional Linkage

The government has mandated NIS to collect all types of data, including data on agriculture sector. However, due to the constraints of manpower and resources within the NIS, it seeks support of different ministries to shoulder this responsibility. The NIS supports the idea of statistical development in individual ministries. NIS has formed a steering committee with a membership in each ministry. Accordingly, even after the restructuring of the statistical system in the country in 1997, DPS continued its role as the main Government agency responsible for collection and publication of official and publication of official agricultural statistics in Cambodia. The National Coordinator to the Agricultural Statistics is an institutional member of the NIS Steering Committee. The primary role of this steering committee is to avoid duplication of efforts in data collection.

The DPS and NIS complement each other nicely: DPS is one of the main users of NIS agricultural data and listing frames; and NIS is one of the main users of DPS' agricultural data (for Gross Domestic Product calculation). It is important to note that DPS and NIS have reached an agreement on each agency's interventions in the field of agricultural data collection, compilation, processing, publication and dissemination. DPS shoulders the responsibility of collecting and providing current agricultural statistics and NIS is involved in census or probability surveys on population, household consumption, income, expenditure, health, nutrition, etc. A consensus between DPS and NIS can also be reached on the conduct of an agricultural census in Cambodia.

A major constraint for the work of NIS, as for many if not all the statistical units in line ministries, is the relatively low level of its budget allocation from government. The amount allocated for statistics has been increasing in recent years, but even in 2005 the allocation was only \$500,000. In order to achieve its work program, NIS has to rely heavily on the goodwill of international donors in supporting its program. This whole issue is bound up with the question of salaries for government employees. As with nearly all civil servants, those working in NIS receive only a very small salary, and are forced to take additional outside work in order to survive. It has been suggested that this should be acknowledged explicitly, with staff being required only to work an appropriate number of hours commensurate with the amount of salary received, on the basis of one dollar for one hour's work. Those classified as falling within the Priority Mission Groups (PMG) would receive additional amounts (and work the hours accordingly) to reflect the strategic importance of their position in the implementation of government policies and programs. The recent introduction of the PMG is intended to address the pay problem, but this will only affect a small number of staff.

The Royal Government of Cambodia's funding for official economic, environment and socio-demographic statistics is clearly inadequate, even by least developed countries standards. Funding for balance of payments, and monetary and financial statistics compiled by the National Bank of Cambodia (NBC), and government

finance statistics compiled by Ministry of Economy and Finance (MDF) is minimal. There is little or no capacity to conduct regular surveys of international trade in services, international investment and public sector enterprises or to strengthen administrative data sources, such as international merchandise trade statistics from the Customs and Excise Department (CDD) and foreign investment approvals data from the Council for the Development of Cambodia (CDC); no priority has been given to adequately funding national accounts and prices statistics.

While the government has sought and received over USD 1.5 billion in funding from donors over the next three years, the importance of statistics in measuring policy and program outcomes has not been accorded sufficient priority. Very little funding has been sought for statistics. Poverty reduction measures are the only area of statistics flagged for funding. However the link to key macroeconomic and national environment and social indicators is not fully appreciated. Developing a sound national statistical system, with effective economic and social forecasting models, data coordination and training are all areas that desperately require donor and government support.

1.3 Outputs and Dissemination of Agricultural Statistics

The Department of Planning and Statistics is the main agency responsible for publication and dissemination of agricultural data. Dissemination of data has been seriously constrained by lack of resources. Flow of information to and from PDA needs improvement. Dissemination of agricultural price produced by Agricultural Marketing Office and NIS should be intensified.

Agricultural Statistics can also be found in: www.maff.gov.kh and www.nis.gov.kh

Contact Information

Focal Point of Dissemination: Mr. Chek Nann
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Title of Publication	Domains/ Contents	Medium	Format	Periodicity/ Frequency	Release Calendar
Agricultural Statistical Yearbooks		English and Khmer	Book CD/ Diskette	Yearly	July
Commune Survey on Crops and Livestock		English and Khmer	Book	Some year	June

Title of Publication	Domains/ Contents	Medium	Format	Periodicity/ Frequency	Release Calendar
Crops and Livestock Survey and Crop Cutting Survey		English and Khmer	Book	Some year	June
Agricultural Statistics Year Book		English and Khmer	Book	Yearly	July
Food Balance Sheet (Paddy)		English and Khmer	Book	Yearly	July
Crop Cutting Survey on Rice		English and Khmer	Book CD/ Diskette	Yearly	July
Pilot Cost of Production Survey on Paddy, Soybean, Cassava, Maize, Peanut, Sugar Cane, Orange, Coffee, and Family Rubber		English and Khmer	Book CD/ Diskette	Some year	June
Annual Conference on Agriculture, Forestry and Fisheries		English and Khmer	CD/ Diskette	Yearly	April

1.4 Dialogue with Data Users and Cooperation with International Organizations

The dialogue with the users of agricultural statistics is being conducted by the Agricultural Statistics Office, Department of Planning and Statistics. In the Central Office, there are internal and external dialogues with the clients and stakeholders. The Forum is expected to end with some resolutions regarding the supply and demand for agricultural statistics.

The Agricultural Statistics Office, Department of Planning and Statistics has good cooperation with international organizations. The Statistics Office has been a beneficiary of the World Bank's Trust Fund for Statistical Capacity Building. This enabled the Statistics Office to establish the Agricultural Statistics System Establishment. The Statistics Office is a partner of the Food and Agriculture

Organization in the promotion of quality agricultural statistics. The FAO and World Food Program (FWP) provided a grant to the Statistics Office for the establishment of an Agricultural Indicators System which we have since improved and maintained. Through another FAO grant, the Statistics Office has created the feasibility of establishing data collection and community level processing and analysis to promote data utilization.

Presently, the Agricultural Statistics Office represents Cambodia in the ASEAN +3 Food Security Information System (AFSIS). The AFSIS provides some financial support for the establishment of the AFSIS in Cambodia.

1.5 Strategic Framework

The near future statistical action plans of NIS

NIS is required to carry out a Census of Establishments every ten years. This census will provide comprehensive information about all sectors of industry, and will enable NIS to set up a comprehensive register of establishments, for use as a sampling frame for future surveys. Previous attempts to construct a sampling frame of industrial establishments, in preparation for earlier surveys of industrial establishments, had resulted in a fairly complete frame for Phnom Penh at the time of listing, but less complete frames for the rest of the country, particularly for smaller establishments. One critical issue would be how to maintain the register over time, so that it can be used regularly for surveys. A related issue is to ensure that all ministries with an interest in establishment data use the same industrial classifications for identifying the industry group to which each establishment belongs.

There have been improvements in the timeliness and regularity of export and import data, and bulletins are produced twice a year, showing the data analyzed according to the Harmonized System. However, detailed monthly data showing commodity by country are needed. Again, NIS needs to work closely with the Customs Department to help improve the quality of data.

Technical Assistance and Financing

Current government funding is only sufficient to compile annual national accounts estimates using data from various government administrative data sources. Donor funding at current levels is required to maintain the existing level of statistical activity. Significant additional funding is required to expand current data collection, coordination, compilation and training activities, and for relevant hardware, software, and intranet and Internet connections. Technical assistance is required in developing and conducting the new surveys, developing and implementing new compilation methods, quality assurance and training, documenting concepts, sources and methods, and dissemination.

Chapter 2. MAJOR DOMAINS AND SELECTED INDICATORS OF AGRICULTURAL STATISTICS

2.1 List of Major Domains and Selected Statistics and Indicators

Domain	Statistics/Indicators
Production <ul style="list-style-type: none"> • Crops • Livestock • Fishery • Macroeconomic Indicators 	Volume of rice (paddy) production Value of rice (paddy) production Rice (paddy) inventory Volume of crop production (other than rice) Value of crop production (other than rice) Volume of livestock production Value of livestock production Livestock inventory Volume of fishery production (municipal, commercial, aquaculture) Value of fishery production (municipal, commercial, aquaculture) Gross National Product Gross Domestic Product Gross Value Added in Agriculture
Trade	Total value of exports & imports Total volume of agricultural exports and imports Total value of agricultural exports and imports
Food Consumption (Only Paddy)	Food Balance Sheet Supply and Demand

Domain	Statistics/Indicators
Prices	Average monthly prices of selected agricultural commodities Producer price
Agricultural Machinery	Number of Agricultural machineries (tractor, power tiller, water pump, thresher, etc.)
Fertilizer	Domestic production Imports and exports Sales Prices
Pesticides	Prices
Land Use	Total household area Irrigated area Area planted/area harvested of crops
Labor & Employment	Rural population Labor force in agriculture Active population in agriculture Total employment Employment in agriculture
Others	Farm household income Agricultural credit Socio-Economic Survey

2.2 Metadata for Each of the Major Domains

2.2.1 Production

2.2.1.1 Concepts, Definitions and Classifications

Crops

Total volume of rice (paddy) production - expressed in million metric tons; average per hectare production is expressed in ton per hectare.

Rice (paddy) production- Quantity of rice produced and actually harvested during the reference period from both farm types and ecosystem (irrigated and rainfed); includes post harvest losses.

Irrigated Rice- requires standing water for its normal growth until harvested.

Rainfed Rice- Rice crop that depends solely upon rainfall for water supply; usually planted through transplanting or direct seeding in fields until harvested.

Area planted/harvested and production by crop type and seed type- data collected are specific for each season. Data on area and production are broken down further by crop type.

Area Planted - means the size of land on which crops are grown. Since land is frequently sown two or more times a year, planted area is potentially larger than cultivated area.

Harvested area- refers to the area from which a crop is gathered. Area harvested, therefore, excludes the area from which, although sown or planted, there was no harvest due to damage, failure, etc. It is usually net for temporary crops and gross for permanent crops. Net area differs from gross area insofar as the latter includes uncultivated patches, footpaths, ditches, headlands shoulders, shelterbelts, etc.

Yield- The data reported under this element represents the harvested production per unit or harvested area for crop products. In most cases, the yield data are not recorded but obtained by dividing the data stored under production element by those recorded under element: area harvested. Data are recorded in kilograms per hectare (kg/ha).

Monthly distribution of production and area harvested- refers to the relative (percent) monthly distribution of area harvested and production.

Fertilizer application- the amount of fertilizer applied and quantity of seeds used for a specific season.

Value of rice- derived by multiplying the volume of production by the producer's (farmgate) price.

Farmgate prices- means the price in which farmers sell their own products at the following sites:

- Crop: farmgate price earns at a farmer's house, field, barn and orchard
- Livestock: farmgate price earns at a farmer's farm, except the price of cattle and buffalo earned at the central market, while the broiler price is set up independently at individual farms.
- Cultured Fisheries: farmgate price earns at the farm or pond
- Marine Fishery: farmgate price earns at a fishing port.

Volume of crop (other than rice (paddy)) production: expressed in metric tons; average per hectare production is expressed in metric ton. The product forms used in the accounting are as follows:

- Maize- in dried; measured in metric tons
- Cassava- in dried; measured in metric tons
- Sweet potatoes- measured in metric tons
- Mung bean- in dried; measured in metric tons
- Peanut- in dried; measure in metric tons
- Soybean- in dried; measure in metric tons
- Sesame- in dried; measure in metric tons
- Tobacco- in dried; measure in metric tons
- Sugarcane- measured in metric tons
- Vegetable- measured in metric tons
- Fruits- measured in metric tons
- Rubber- measured in metric tons

Total value of crop production- derived by multiplying the volume of production by the producer's/farmgate price.

Area Planted- refers to the total area planted to permanent crops. This also refers to the area of multi-harvest temporary crops.

Area Harvested- refers to the total area harvested.

Commercial Crops- crops with commercial value in terms of volume, quality, demand and price.

Crop year- refers to the annual cycle of crop production in which there is a re-current period of growth, ripening and harvesting. In most crops, this starts in May and ends in April of following year.

Hectare - the amount of land equivalent to 10,000 square meters.

Industrial Crops- crops used as inputs to industries.

Permanent Crops- plants grown/harvested which live for an indefinite number of years.

Planting Density- the ratio of the number of plants/ hills/ trees per unit of area.

Production- refers to the growing of crops; this also refers to the volume harvested/picked.

Temporary Crops- crops grown seasonally and whose growing cycle is less than one year. Land preparation and planting for the next season follow its harvesting.

Yield- the production per unit of measure.

Yield Per Hectare- the production per hectare.

Livestock

Volume of livestock production- the volume of meat produced and the change in stocks during an accounting period. The commodities accounted for are the following: cattle, buffalos, pigs and poultry.

Production- refers to the volume of animals disposed for slaughter in live weight equivalent including weight gained within the reference period.

Total slaughtered/dressed- the actual number of animals slaughtered (number of head) or poultry dressed (number of birds) within the reference period.

Total value of livestock production- derived by multiplying the volume of production by the producer's price or the farmgate price.

Livestock inventory- the actual number of animals (in head) present in the households as of a specific reference date. Also called as livestock numbers, or population.

Fishery

Volume of fishery production (commercial, municipal, and aquaculture)- quantity of fish harvested/produced; expressed in kilograms.

Commercial Fishing- the catching of fish with the use of fishing boats for trade, business or profit beyond subsistence or sports fishing, to be further classified as:

Fishing boat- type of watercraft, sailboat, motorboat, etc., either licensed or not, used for fishing purposes.

Aquaculture production- the volume and value of fish harvested/produced in aquaculture farms.

Aquaculture- fishery operations involving all forms of raising and culturing of fish and other fishery species in fresh, brackish and marine water areas.

Fish pond- a land- based type of aquaculture; a body of water (artificial or natural) where fish and other aquatic products are cultured, raised or cultivated under controlled conditions.

Fish pen- an artificial enclosure constructed within a body of water for culturing fish, fishery/aquatic resources; made up of bamboo poles closely arranged in an enclosure with wooden material, screen or nylon netting to prevent escape of fish.

Fish cage- a stationary or floating fish enclosure of synthetic net wire/bamboo screen or other materials set in the form of inverted mosquito net (“hapa” type) with or without cover with all sides either tied to poles staked to the water bottom or with anchored floats for aquaculture purposes.

Macroeconomic Indicators

Gross National Product- the Gross Domestic Product adjusted with the net factor income from the rest of the world. It refers to the aggregate earnings of the factors of production (nationals) plus indirect taxes (net) and capital consumption allowance.

Gross Domestic Product- the value of all goods and services produced domestically; the sum of gross value added of all resident institutional units engaged in production (plus any taxes, and minus any subsidies, on products not included in the values of their outputs).

Gross Value Added (GVA)- total payment to factors of production namely: wages, interest, profit and rent. It also includes capital consumption allowance and indirect taxes. It is estimated by deducting from the gross value of output the sum of non-factor cost such as raw materials, fuel, advertising and other non-industrial overhead cost.

2.2.1.2 Coverage, Availability, Data Sources and Responsible Agencies

Statistics/ Indicators	Coverage	Availability	Data Source	Responsible Agencies
Crops				
Volume of rice production	national and sub-national levels	1980 – 2005	Rice Production Survey	
Value of rice production	national level	1993 - 2005	Rice Production Survey, Farm Prices Survey	
Rice inventory Planted area	national and sub-national levels	1993 – 2005 (Weekly data for national; and sub-national level)	Records from Provincial Department of Agriculture and Stock of Ministry of Commerce	

Statistics/ Indicators	Coverage	Availability	Data Source	Responsible Agencies
Volume of crop production (other than rice)	national and sub-national levels	1980 - 2005	Crops Production Survey, Administrative Records from Provincial Department of Agriculture	
Value of crop production (other than rice)	national level	1993 – 2005	Agriculture Finance Survey 2002	
Livestock				
Volume of livestock production	national and sub-national levels	1980 - 2005	Livestock Sample Survey, Survey of Abattoirs, Records from Provincial Department of Agriculture	
Value of livestock production	national level	1993 - 2005	Agriculture Finance Survey 2002	
Livestock inventory	national and sub-national levels	1980 - 2005	Livestock Survey	
Fishery				
Volume of fishery production (municipal, commercial, aquaculture)	national and sub-national levels	1980 - 2005	Survey of Commercial/ Municipal Fish Catch and Price, Aquaculture Surveys, Survey of Inland Municipal Fishing Households, Administrative Records from the Department of Fisheries (DoF)	
Macroeconomic indicators				
Gross National Product	national level	1993 – 2005	National Institute of Statistics (NIS)	NIS
Gross Domestic Product	national levels	1993 –2005	National Institute of Statistics (NIS)	NIS
Gross Value Added in Agriculture	national levels	1993 – 2005	National Institute of Statistics (NIS)	NIS

2.2.1.3 Data Processing, Estimation and Revision Methodology

Data were entered, cleaned and analyzed using Microsoft Access. Two database files were created: one for paddy and another for soybean. For paddy, three separate tables were formed to store data from province, village and household questionnaires. In the case of soybean, the number of tables was only two (for two types of questionnaires). Data were entered into these tables directly. Data cross-checks, cleaning, and analysis were done with the "query" of Access.

Agricultural sector current price estimates are based on gross value added to output ratios derived from irregular MAFF and NIS surveys and adjusted for significant changes in input costs. This is applied to production data sourced from various departments within MAFF and balance of payments (BOP) data for exports of agricultural products (with adjustments for under-coverage). For crops and livestock production, MAFF production data and NIS data on household consumption of fruit and vegetables and commercial agribusinesses production are used in estimating output. A supply/use estimation model is used for fisheries production (based on MAFF data, population projections and water level data) adjusted for under-coverage and cross-checked with fish consumption expenditure plus export estimates.

In estimating current and constant price value added, adjusted farm gate prices and price indices are calculated from retail and wholesale prices collected by MAFF, the NIS Phnom Penh and Urban CPI. Household final consumption expenditure implicit price deflators are used. It is assumed that farm gate prices move along parallel lines with MAFF wholesale and NIS retail prices data. For export-oriented production such as rubber and logging, export prices indices are used.

2.2.1.4 Other Reference Information

Other information related to agricultural data can be found from DPS such as:

- a. agricultural land use;
- b. national and provincial level food balance for rice;
- c. area and production of different crops;
- d. crops areas destroyed by natural calamities and by pests/insects;
- e. utilization of agricultural inputs;
- f. agricultural machinery;
- g. retail and wholesale market prices of agricultural commodities;
- h. areas under mechanized agriculture;
- i. number of livestock by type and use;
- j. rubber plantation and production;
- k. weather (temperature and rainfall);
- l. forestry and forestry products, and
- m. fisheries (production).

Another agency which can provide any information related to agricultural data is the NIS. The agricultural statistics can also be found in the following websites:

- www.maff.gov.kh
- www.nis.gov.kh

2.2.2 Trade

2.2.2.1 Concepts, Definitions and Classifications

Volume of agricultural exports and imports- refers to the quantity of goods exported/imported expressed in kilograms (kg) for most items; live animals in heads.

Value of agricultural exports and imports- F.O.B and C.I.F. values for imports; F.O.B. value for export.

Free on Board (F.O.B.) Value- the value of the goods free on board the carrier at the frontier of the exporting country. It includes inland freight, export duty and other expenses. Ocean freight, insurance and consular fee are, however, excluded.

Cost Insurance Freight (C.I.F.) Value- derived by adding the three components costs of the commodity, namely: the F.O.B. value, the insurance cost and the freight cost from the exporting country's frontier to its destination.

Exports- all goods leaving the country which are properly cleared through the Customs.

Imports- all goods entering any of the seaports or airports of entry of Cambodia properly cleared through the Customs or remaining under Customs control, whether the goods are for direct consumption, for enchanting (global manufacturing, global wholesaling/retailing, and commodity dealing that is settled by trade in commodities), for warehousing or for further processing.

Balance of Trade- the difference between the value of the nation's exports and the value of its imports. When exports are higher than imports, there is a trade surplus. While when imports exceed exports, there is a trade deficit.

2.2.2.2 Coverage, Availability, Data Sources and Responsible Agencies

Statistics/ Indicators	Coverage	Availability	Data Source	Responsible Agencies
Total value of exports & imports	International (by country of origin and destination)	1993 – 2005		

Statistics/ Indicators	Coverage	Availability	Data Source	Responsible Agencies
Total volume of agricultural exports and imports	International (by country of origin and destination)	1993 - 2005		
Total value of agricultural exports and imports	International (by country of origin and destination)	1993 - 2005		

2.2.3 Food Consumption

2.2.3.1 Coverage, Availability, Data Sources and Responsible Agency

Statistics/ Indicators	Coverage	Availability	Data Source	Responsible Agency
Food Balance Sheet	National level	1992- 2005	Provincial Department of Agriculture (PDS) and other sources	NIS
Supply and Utilization	National level	1992- 2005	Agricultural Statistics Office-operating with PDA	NIS

2.2.4 Prices

2.2.4.1 Concepts, Definitions and Classifications

Average monthly prices of selected agricultural commodities- average prices of agricultural commodities computed monthly at farmgate, wholesale and retail levels.

A. Farmgate Prices- payments received by farmers for the sale of their produce at the first point of sale regardless of whether sold in the farm or elsewhere.

Prices received by Farmers for Crops- the farmer's selling prices for their products at the first point of sale.

Farmers- persons actively engaged in farming and producing agricultural commodities.

Wholesale market - a market place where trading in bulk is usually conducted.

B. Wholesale Price- prices which can be either wholesale buying and/or wholesale selling

Wholesale buying price- the price that traders pay for commodities they buy in bulk from farmers/raisers/fishermen and fellow traders.

Wholesale selling price- the price at which traders or distributors sell their commodities in bulk to retailers and other distributors.

Traders - buy and sell goods or commodities.

Wholesalers- refers to those who buy in bulk from farmers/raisers/fishermen and fellow traders.

Wholesale Market - a place where large volume of commodities coming from production areas are assembled, traded and transported to other markets within and outside the province.

C. Retail Prices- the price at which retailers sell their goods or commodities to consumers in the marketplace.

Retailers - sell directly to consumers.

Retail Market - a place recognized in the municipality where transaction of goods involves small volume and intended for final consumers.

2.2.4.2 Coverage, Availability, Data Sources and Responsible Agencies

Statistics/ Indicators	Coverage	Availability	Data Source	Responsible Agencies
Average monthly prices of selected agricultural commodities	national and sub-national levels	1990 – 2005 (Market wholesale and retail prices)	Farmgate prices: Farm Prices Survey Market (Wholesale and Retail) Prices: Integrated Agricultural Marketing Information System (AGMARIS)	

Statistics/ Indicators	Coverage	Availability	Data Source	Responsible Agencies
Producer Price	national levels	2005	Volume of production: See data sources for crops, livestock Farm Prices: Farm Prices Survey	

2.2.5 Agricultural Machinery

2.2.5.1 Coverage, Availability, Data Sources and Responsible Agencies

Statistics/ Indicators	Coverage	Availability	Data Source	Responsible Agencies
Number of agricultural machineries (tractor, Power Tillers, thresher etc)	national and sub-national levels	1990-2005	Ministry records	

2.2.6 Fertilizer

2.2.6.1 Concepts, Definitions and Classifications

Fertilizer -a substance (as manure or chemical mixture)used to make soil more fertile.

Fertilizer Prices (Dealers' Prices)- the selling prices of dealers of agricultural inputs and/or fertilizers.

2.2.6.2 Coverage, Availability, Data Sources and Responsible Agencies

Statistics/ Indicators	Coverage	Availability	Data Source	Responsible Agencies
Domestic production	national level	2003 – 2005		
Imports	national level	1985 – 2005	Records of Fertilizer Companies and Department of Legislation	Fertilizer Companies and Department of Legislation
Prices	national and sub-national levels	2000 - 2005	Integrated AGMARIS	

2.2.7 Pesticides

2.2.7.1 Concepts, Definitions and Classifications

Pesticides- substances or any mixtures of substances intended for preventing, destroying or controlling pests, including vectors of human or animal diseases, unwanted species of plants or animals causing harm during or otherwise interfering with the production, processing, storage, transport or marketing of food, agricultural commodities, wood or wood products, or animals feed stuffs.

Insecticides- chemical compounds used to control insects. Sub-divided by different modes of action.

2.2.7.2 Coverage, Availability, Data Sources and Responsible Agencies

Statistics/ Indicators	Coverage	Availability	Data Source	Responsible Agencies
Prices	national and sub-national levels	2000 - 2005	Integrated AGMARIS	
Import			Records of Pesticide Companies and Department of Legislation	Pesticide Companies and Department of Legislation

2.2.8 Land Use

2.2.8.1 Coverage, Availability, Data Sources and Responsible Agencies

Statistics/ Indicators	Coverage	Availability	Data Source	Responsible Agencies
Total Farm Area	national and sub-national levels	1994		
Irrigated area	national and sub-national levels	1994		
Area planted/area harvested of crops	national and sub-national levels	1980 / 2005		

2.2.9 Labor and Employment

2.2.9.1 Concepts, Definitions and Classifications

Rural population- total number of individuals living in the rural areas.

Employment- persons in the labor force who are reported either at work or with a job or business although not at work during the reference week

2.2.9.2 Coverage, Availability, Data Sources and Responsible Agency

Statistics/ Indicators	Coverage	Availability	Data Source	Responsible Agency
Rural population	national and sub-national levels	1998 / 2003	Census of Population	NIS
Labor force in agriculture	national and sub-national levels	1998 / 2003		NIS
Total employment	national and sub-national levels	1998 / 2003	Census of Population	NIS
Employment in agriculture	national and sub-national levels	1998 / 2003	Census of Population	NIS

2.2.10 Others

2.2.10.1 Concepts, Definitions and Classifications

Agricultural credit- comprises all advances and/or loans given to farmers to finance activities relating to the agriculture sector which includes crops, livestock and poultry, fisheries and forestry.

Total family income- includes primary income and receipts from other sources received by all family members during a specific calendar year as participants in any economic activity or as recipients of transfers, pensions, grants, etc.

Primary income- includes salaries and wages, commissions, tips, bonuses, family and clothing allowance, transportation and representation allowances, honoraria, and other forms of compensation and net receipts derived from the operation of family-operated enterprises/activities and the practice of a profession or trade.

2.2.10.2 Coverage, Availability, Data Sources and Responsible Agencies

Statistics/ Indicators	Coverage	Availability	Data Source	Responsible Agencies
Rural family income	national and sub-national levels	2004	Income and Expenditure Households Survey	
Agricultural credit	national level	2000-2005	Rural Development Bank	

Chapter 3. MAJOR DATA SOURCES FOR AGRICULTURAL STATISTICS

3.1 List of Major Agricultural Censuses, Surveys, and Registers

Censuses

1. Population Census of NIS

Surveys

1. Crop and Livestock Survey and Crop Cutting Survey
2. Cost of Production Survey

Registers

3.2 Metadata for Each of the Major Censuses

3.2.1 Population Census of NIS

3.2.1.1 Overview

The result of population census of 1998 provided various socio-economic data at all administrative levels. Population census data are useful in performing consistency checks and in bringing further improvements in the data produced by MAFF. Population census results provide data on:

- a. population by sex;
- b. number of rural households;
- c. number of crop producing households;
- d. number of people involved in agriculture;
- e. number of households engaged in fisheries and;
- f. number of economically active persons.

Availability of the listing frame of villages from the population census results is also important in agricultural statistics system development. The census provides village level information on the number of households involved in a particular agricultural activity (e.g. crop production, livestock marketing, mixed farming, fisheries, etc). This type of information is helpful, inter alia, to increase the reliability of the results of agricultural sample surveys.

3.3 Metadata for Each of the Major Surveys

3.3.1 Crop and Livestock Survey and Crop Cutting Survey

3.3.1.1 Overview

In 2002, the Department of Planning, Statistics and International Cooperation (DPSIC) of the Ministry of Agriculture, Forestry and Fisheries (MAFF) conducted two types of survey: i) crop and livestock survey; and ii) crop cuts survey of wet-season rice. The surveys were conducted to:

- a. provide training to local staff in survey data collection, processing and analysis;
- b. develop sample survey methodology for collecting agricultural data from households; and
- c. estimate important parameters of agriculture and its economy.

The surveys were conducted in the period of November 2002 to December 2002 in close cooperation with the respective Provincial Department of Agriculture, Forestry and Fisheries (PDAFF). Data for the survey came from 5,852 households belonging to 17 provinces.

Main data covered by the main survey were crop area and production, and livestock numbers. The result of the Crop Yield Survey was used to estimate the wet-season 2002 paddy yield. Crop statistics covered by the surveys centered primarily on crop area and production. Some other socio-economic aspects of crop husbandry covered by the surveys include farm population, use of draught animal, chemical fertilizer use, and crop sales.

3.2.1.2 Survey Design

Sample Selection Procedures¹

Three specific tasks are needed for selection of villages and households:

- a. Preparation of provincial frame of villages;
- b. Selection of villages by Probability Proportional to Size (PPS) with replacement; where the size of a village is the number of crop producing households in it; and
- c. Selection of crop producing households in each sampled village by Simple Random Sampling (SRS).

¹ The selection procedures are detailed also in a separate mimeograph entitled "Selection Procedures of Villages and Households in the 2001 Sample Survey". See the report for details.

TASK I: Prepare frame of villages

The source of frame of villages is the population census database from NIS which is extracted in NISFRAME.xls. NISFRAME.xls has 13,716 records (for 13,716 villages) and 10 self-explanatory fields as follows:

PRO DIS COM VIL VILLNAME HHOLDS HH011 HH012 HH013 HH050

Most important fields are PRO, COM, VIL, VILLNAME and HH011.

STEP 1.1: Invoke Excel and **OPEN** NISFRAME.xls

STEP 1.2: Use Microsoft Excel

- | Data | Filter | Autofilter |
|--|--------|------------|
| • Go to column with the heading PRO | | |
| • Highlight the PRO number and Click (e.g. for Takeo, highlight 21 and Click) | | |
| • Highlight and COPY all filtered cells to a new workbook called SampleXX.xls, where XX is the code for the province. For example, for Takeo, the file name would be SAMPLE21.xls. | | |

STEP 1.3: Remove the following columns from SAMPLEXX.xls

HHOLDS HH012 HH013 HH050

and **Save**

STEP 1.4: Filter all but Special Settlements (VIL=91) from SampleXX.xls

(Special Settlements are not easy to identify because they all have same codes)

Use

Data	Filter	Autofilter	(Custom)	“does not contain”	91
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STEP 1.5: Highlight the filtered cell and COPY it to **FRAMEXX1**. Note that FRAMEXX1 has the following:

A	B	C	D	E	F
PRO	DIS	COM	VIL	VILLNAME	HH011

STEP 1.6: Add 7th columns called **CUM**
FRAMEXX1.xls has following now, where XX is the province code:

A	B	C	D	E	F	G
PRO	DIS	COM	VIL	VILLNAME	HH011	CUM

Save As **FRAMEXX2.xls**

STEP 1.7: Calculate cumulative number of households at the DISTRICT levels.

Example, for XX01 district,

At G2	Type	=VALUE(F2)
At G3	Type	=VALUE(F3)+G2

COPY this cell (G3) to G4 to G_{n_i} (where n_i is the number of villages in the district)

Repeat STEP 1.7 for other districts. Note that you require cumulative values of HH011 by village.

TASK II: Selection of villages from the frame

STEP 2.1: There are 1,563,050 crop-producing households in the frame and 1,100 villages are to be drawn. Allocate the number of villages to be sampled. For example, the number of villages to be sampled in 2101 is given by:

$$7,848/1,563,050*1,100 = 6 \text{ villages.}$$

Apply similar conventions for other districts.

Special Note:

For unbiased estimation, a sample must have a minimum of 2 units. Hence, if the calculated value of the number of selected villages in a district is 1, adjust it to 2. This upward adjustment at the district level has to be offset by decreasing the number of villages to be covered in other district(s) in the same province.

For 2101 district, draw six random numbers.
You may do this by:

Shift " . " x 7848 in Casio Programmable calculator

STEP 2.3: Identify the villages

Use FRAMEXX2.xls.
Save As FRAMEXX4.xls

Note that the cumulative numbers of crop-producing households in villages are as follows:

21010101	1-495
21010102	496-713
21010103	714-980
21010104	981-1270

And so on.

The first random number is 4763. Look for the appropriate range. The Range for Samraoung village is 4669 to 4797. 4763 lies between 4669 and 4797. Hence, Samraoung village (21010405) is selected.

Write:

Yes against **SELECTED** and
The number of times a village is selected (1,2,3, etc.) against **Time**

Proceed similarly for other remaining villages. After identification villages in all districts,
Save FRAMEXX4.xls

STEP 2.4: Use **Filter Autofilter** **Select** Yes

Highlight the filtered cells and copy to a new worksheet.
Save As **FRAMEXX5.xls**
Selection procedure of villages from other districts is the same.

TASK III: Selection of Crop Producing Households

STEP 3.1: In each village, select a random number between 1-HH011 and note down the number.

For random selection, you can use
Shift "." x HH011 in Casio Programmable Calculator.

STEP 3.2: Repeat STEP 1 to select 5 distinct households.

STEP 3.3: Repeat STEP 1 and 2 if a village is selected more than once.

Estimation Procedure

The first-stage units (villages) were selected with replacement. Simple random sampling without replacement was used for the selection of the second-stage units (households).

Notations

L be the number of districts in a province. For example, for Banteay Meanchey province, L=8.

Let y_{ijk} be the value of a variable (e.g. rice area) in the k^{th} household of the j^{th} village in the i^{th} district

N_i number of villages in the i^{th} district.
(NBIG)

n_i number of sampled villages in i^{th} district
(nsmall i.e. number of VSample)

If ij -th village happened to be selected λ_{ij} times in a sample of n_i villages, λ_{ij} independent sub-sample of 5 ssu (households), each of which was drawn at random by without replacement sampling.

M_{ij} is the number of crop producing households in the j^{th} village of i^{th} district
(HH011)

m_{ij} is the selected number of crop producing households in the j^{th} village of i^{th} district (normally 5)

M_{i0} is the number of crop producing households in the i^{th} district (DH011)

M_0 is the total number of crop producing households in the province (PH011)

P_{ij} Probability of selecting the j^{th} village of the i^{th} district

Let
$$\bar{z}_{ij} = \frac{M_{ij} \bar{y}_{ij}}{P_{ij} M_{i0}}$$

Where, \bar{y}_{ij} is average value for the j^{th} village in i^{th} district

Let,

$$\bar{\bar{z}}_i = \frac{1}{n_i} \sum_{j=1}^{n_i} \bar{z}_{ij}$$

Estimate of the standard error of $\bar{\bar{z}}_i$ is given by:

$$SE_i = \sqrt{\left(\frac{1}{n_i(n_i-1)} \sum_j (\bar{z}_{ij} - \bar{\bar{z}}_i)^2 \right)}$$

An unbiased estimate of mean at provincial level is \bar{z} , where,

$$\bar{z} = \sum_i \frac{M_{i0} \bar{\bar{z}}_i}{M_0}$$

Standard Error of the provincial mean \bar{z} is estimated as:

$$SE(\bar{z}) = \sqrt{\left(\sum_i^L (M_{i0}^2 * SE_i^2) / M_0^2\right)}$$

Percent Standard Error of \bar{z} is estimated as:

$$PSER(\bar{z}) = 100 * \frac{SE(\bar{z})}{\bar{z}}$$

Sampling Frame

The 1998 Population Census was used by the National Institute of Statistics (NIS), Ministry of Planning.

The sampling frame was constructed by integrating the population census (updated provincial lists and number of households with data on technical frame on agricultural statistics).

Sampling Design/Statistical Unit/Selection Procedure

15,000 households were selected from the 1998 Population Census frame and the survey will be conducted in 24 provinces. All provinces covered through the use of random tables. It employed simple random sampling, systematic sampling and probability proportional to size sampling.

Main Data Items and Variable for Operational Purposes

The main data items were the following: size of farm parcel, location of farm, agricultural land, presence of irrigation, physical area of temporary crops planted by parcel, harvested area and production, permanent crops, inventory of livestock and poultry and number of machineries and facilities.

Reference Period: 2006

Date of Data Collection: March 2007

Geographical Scope: 24 provinces

3.3.1.3 Conduct, Operations and Data Quality Control

Operation at the Centre

The Chief of Statistics Office, DPSIC shouldered the responsibility of implementing both types of surveys. Mode of operation and the time schedule were followed as per the sub-component's Work Plan 2002. Considerable improvements were brought in the 2002 sample survey programme through the following:

- a. development of provincial trainers;
- b. identification of trainers and participants;
- c. preparation of checklists of all main operations;
- d. better organized training materials and teaching aids,
- e. installation of area-measurement programmes onto 100 units of Casio programmable calculators by the provincial trainers;
- f. full-time participation of trainees; and vii) upward adjustment in duration of the training compared to 2000 (from 2 days to 3 days).

Operation in Provinces

The total number of supervisors and enumerators were 85 and 275, respectively. In each province, two staff members of the PDAFF shouldered the responsibility for implementation of survey work. Altogether, five staff from PDAFF (2 staff from Planning and Statistics, 2 from Office of Agronomy and one from the Office of Animal Production and Health) coordinated surveys' supervisory work. In each district, one or two staff members of District Agriculture Office contributed as enumerators.

Training and General Instructions

The 2002 training programme was targeted to the enumerators and supervisors in three provinces² only. Only short instructions were provided to the PDAFF staff in the remaining fourteen provinces³ covered by the 2000 and 2001 sample surveys. Purpose of 3-day-long training-course in the three provinces was to train the staff from PDAFF and District Agricultural Offices in the collection of data from selected villages and households. The objectives of the training programme were:

- a. to train central, provincial and district staff in sample surveys;
- b. to identify enumerators and supervisors for the 2002 Survey; and
- c. to provide logistics and resources for the 2002 Sample Surveys.

The TA prepared the training material extensively used during the training sessions. Emphasis in the training was placed on the development of skills of participants in selection and identification of sample and collection of primary agricultural data from selected sample. Teaching aids included computer displays, statistical publications, slides, maps and exhibits. The training materials, survey material and field equipment included:

- a. List of sampled villages (English/Khmer with codes);
- b. Serial Numbers of selected crop-producing households in sampled villages for household enumeration;

² Prey Vihear, Krong Preah Sihanouk and Stung Treng

³ Banteay Meanchey, Battambang, Kampong Cham, Kampong Chhnang, Kampong Speu, Kampong Thom, Kampot, Kandal, Kratie, Prey Veng, Pursat, Siem Reap, Svay Rieng, and Takeo

- c. Serial Numbers of selected crop-producing households in sampled villages for crop cuts;
- d. Copies of all questionnaires;
- e. Calculator, tape and bearing compass for measurement of area of fields;
- f. Sacks for collecting grains from crop cuts;
- g. Tag-sheet for tagging crop-cuts sacks.

All training sessions were conducted in *Khmer* wherein classroom training of enumerators and supervisors lasted for two-and-half day. The last day was devoted to field-level training on area measurement and crop cutting. A manual of instruction was provided to each enumerator and supervisor.

The topics covered by the survey-specific training can be broadly grouped into three modules. Details on the modules are mentioned below:

Module I

This module aimed to develop skills of the participants in:

- a. use of codes of villages,
- b. identification of sampled villages for survey;
- c. preparation of the list of crop producing households in the sampled villages; and
- d. identification of sampled households for enumeration.

Module II

This module covered instructions for completing the questionnaires of the survey. The Questionnaires is comprised of the following:

- a. District Questionnaire;
- b. Village Questionnaire;
- c. Household Listing Forms (FORM 1 and FORM 2);
- d. Household Questionnaire (FORM 3)
- e. Crop-Cuts Questionnaire (FORM 4)

Module III

This module concentrated on practical aspects of area measurement and crop-cuts. The topics covered under this were:

- a. Use of measuring tapes, moisture meter, and bearing compass;
- b. Area measurement of a field by using bamboo poles, measuring tapes, and bearing compass;
- c. Measurement of diagonals of a 2mx2m plot for crop cuts;
- d. Crop-Cuts from a 2mx2m plot;

- e. Moisture content measurement of paddy grain obtained after crop-cuts.

Some aspects of the training programmes were specifically targeted to PDAFF staff. These aspects included:

- a. accurate measurement of the weight of grain from crop cut plots;
- b. measurement of moisture content;
- c. completing the crop cut questionnaires at PSO.

The training in three provinces was conducted in October and November 2002.

Questionnaires

The survey was conducted in two rounds. First round of the survey was completed by end-November; final round of the surveys was over by mid-January 2003.

Summary Form: District-level Questionnaire

The purpose in this questionnaire was to collect existing subjective data from District Agriculture Offices. The data covered by the questionnaire were:

- a. irrigated area;
- b. area and production of different crops;
- c. area under different fruits; and
- d. livestock numbers.

Summary Form: Village-level Questionnaire

Village-level questionnaire was used to collect subjective agricultural data from selected villages. Data collected under this are useful for future reference. The questionnaire covered the following data at village level:

- a. irrigated area;
- b. area and production of different crops;
- c. number and area under different fruits;
- d. livestock numbers.

Form 1: Village-level Listing Questionnaire

The respondents of this questionnaire were respective village heads. Items covered by FORM 1 included:

- a. number of households,
- b. number of crop growing households,
- c. list of selected farmers for Crop Cuts of Rice (i.e. for FORM 4).

Form 2: Listing and Selection of Crop Growing Households

This form was used to prepare a list of crop producing households in the sampled villages. Selection of crop growing households was done from the list. In each sampled village, the selection identified: i) 5 or 10 crop growing households⁴ for completing FORM 3, and ii) 2 or 4 crop growing households for completing FORM 4. These households were identified on the basis of their order of selection in i).

Form 3: Household Questionnaire

This questionnaire was completed in 5-10 crop-growing households identified in FORM 2. Data collected in FORM 3 is comprised of the following:

- a. age of the farmer;
- b. sex of the head of the household;
- c. family size by sex;
- d. number of working members by sex;
- e. number of fields operated in the wet season 2002;
- f. area of fields operated in the wet season 2002;
- g. area under irrigation;
- h. planted area, destroyed area, harvested area and production under paddy by type and by season;
- i. harvested area and production under minor crops;
- j. number of cattle, buffaloes, pigs and poultry by sex and by use;
- k. amount of rice, maize and other crops sold;
- l. area intended for planting in the 2002 dry season;
- m. availability and use of draught power;
- n. exchange of human labour with human labour (Yes/No);
- o. exchange of human labour with animal labour (Yes/No);
- p. hiring of labourers for farm operation (Yes/No); and
- q. use of chemical fertilizer (Yes/No).

Form 4: Crop-Cuts Questionnaire

This questionnaire covered 2 crop-growing households identified in FORM 1. In each household, rice-yield data were collected from 2 plots (2 fields; 1 plot in each field). Items covered by FORM 4 were:

- a. planting date (week and month);
- b. type of rice (early, medium, and late);
- c. variety of rice (local or hybrid);
- d. amount of seed used in the crop-cut field;

⁴ The sampling design was one of stratified two-stage sampling designs. Districts were treated as strata. At the first stage, a sample of villages was selected in each district with probability proportional to size (the number of crop-producing household in the village) with replacement. At the second stage, 5 households were selected if a village was selected once; 5 additional households were independently selected if the village was selected twice, and so on.

- e. weeding done (Yes/No);
- f. fertilizer used (Yes/No);
- g. crop condition compared to last year (better, similar or worst);
- h. crop condition compared to normal year (better, similar or worst);
- i. weight of harvested grain from the sampled plots (at district);
- j. weight of harvested grain from the sampled plots (at PDAFF);
- k. moisture content of the harvested grain at the time of weighing;
- l. area of the crop-cut field (objective measurement); and
- m. area of the crop-cut field (farmer's estimate).

Survey Schedule and Output

Preparation of a Proposal

Data collection for the first round (FORM1, FORM2 and FORM3) started immediately after the training. For the second round, data collection schedule depended on the date of harvest of wet-season paddy in the sampled households which started mostly from the first week of December.

Processing of Completed Forms and Report Writing

All completed questionnaires were retrieved on time. Completed questionnaires of both surveys reached DPSIC by mid-January where manual processing of the completed forms was also carried out. This operation included checking for complete and item non-response, correcting obvious errors and coding.

Electronic data processing started from early-December where data from the survey were entered onto microcomputers by using four microcomputers. The FAO Technical Adviser prepared computer programmes for data entry, editing and summarization.

Main part of the report was written in March following production of final output tables of the survey results. Time schedule of the data processing activity is presented in Table 1.3:

Table 1.3: Time schedule of data entry and analysis

Item	Crop cuts results	Main survey results
Data entry	December 2002	2/12/2002 to 28/02/2003
Cleaning of data	2-16 January 2003	3 – 28 February 2003
Analysis	16-17 January 2003	17 February to 14 March 2003
Reporting	17 January 2003	17 March 2003

Reference Period

- | | |
|-----------------------------|---------------|
| a. Crop area and production | 2002/03 |
| b. Livestock numbers | November 2002 |

Non-sampling errors

Complete non-response (e.g. no reporting from a village or household) was not a major problem in the 2002 survey whilst various item of non-responses were noticed. Various consistency checks were applied to minimize obvious errors in reporting. Imputation for obvious non-responses was also made.

Lack of accurate reporting from the field has been the major component of the non-sampling errors in the estimates provided by the survey. PDAFF and DPSIC should put extra efforts to mitigate the problems of faulty and/or insincere reporting. More emphasis should be placed by DPSIC and PDAFFs on supervision.

Sampling errors

Sampling errors of provincial estimates of important parameters - like family size of crop producing household, number of working members, total planted area under rice, harvested area, average rice yield, etc. - are at acceptable levels. A technical report covering the sampling design, sampling errors of important estimates, data processing and other technical aspects was issued.

Survey Costs

The cost of the 2002 survey was \$80,400. This cost excludes the costs of trainers' DSA and travel expenses. Breakdown of the total cost is presented below:

Table 1.4: Survey Costs (US\$)

Item	Cost (US\$)
Provincial training (trainees' DSA and travel, and other costs)	6,900
Crop and livestock survey	46,500
Crop cuts survey	27,000
Total	80,400

Intensive training was provided to the enumerators and supervisors of the three new provinces only. Average cost of the provincial training is estimated to be about US\$17 per person per day, including the travel costs of the participants. For other fourteen provinces covered by the survey, training programs were conducted in previous two years. Only general instructions were provided to the staff from the provinces already covered in 2000 and 2001 survey programs. In general, as data

collection activities in the initial years of statistical development are part of capacity building, all costs involved are investment costs.

3.3.2 Cost of Production Survey

3.3.2.1 Overview

Costs and returns data of typical farms are very important for meaningful analysis of the economic profitability of the existing system of agricultural enterprise or farming practices. These data also serve the agricultural development planning and research needs. Various countries use crop specific data on cost of production for fixing minimum support price of the crop, knowing comparative advantage of the crop against the world market price and comparing the economic benefit of the crop against other farming practices. The data are also useful for the system of national accounts.

Objectives

The objectives of the pilot survey were to provide direction for the conduct of in-depth cost of production survey in 2005 and to instruct local staff on cost of production data collection, processing and analysis.

Coverage and Scope

The survey covered wet season rice, dry season rice, dry season corn, dry season cassava, dry season peanut, dry season sugar cane, wet season soybean, orange, coffee and rubber. Wet rice and soybean data referred in this report are for 2004/05 crop season; dry rice and others crop data are for the 2005 harvest. Geographic coverage and the scope of the survey are presented below:

Crop	Provinces
Wet rice	Battambang, Pursat, Prey Veng, Takeo, Rattanakiri
Dry rice	Kampong Cham, Kampong Chhnang, Kandal, Prey Veng, Takeo
Corn	Battambang, Kampong Cham, Kandal, Prey Veng
Soybean	Battambang, Kampong Cham
Cassava	Battambang, Kampong Cham, Siem Reap
Peanut	Battambang, Kampong Cham, Kandal
Sugar Cane	Kampong Cham, Kandal
Orange	Battambang, Pursat
Coffee	Rattanakiri
Family Rubber	Kampong Cham

3.3.2.2 Survey Design

Design of the Questionnaires

The questionnaires were designed at PDAFF, after receiving feedbacks from the PDAFF. These were revised several times. Three types of questionnaires were designed in the case of rice for recording data from farmers. Only two types were used in the case of soybean, cassava, maize, peanut, sugar cane, soybean, orange, coffee, and family rubber.

Rice

- FORM CP1R: Provincial Questionnaire
- FORM CP2R: Village Level Questionnaire
- FORM CP3R: Household Questionnaire

Other Crops

- FORM CP1: Village Level Questionnaire
- FORM CP2: Household Questionnaire

Sampling Frame

The survey used the list frame from the NIS in drawing out sample households.

Sampling Design/Statistical Units/Selection Procedure

Sample households in 14 provinces were drawn using the random table.

Main Data Items and Variables for Operational Purposes

The main data items were the following: size frame of household, permanent crops, irrigated area and temporary area.

Reference Period: 2006

Geographical Scope: 14 provinces

3.3.2.3 Conduct, Operations and Data Quality Control

Survey Operations and Costs

The enumerators and supervisors for the survey were local staff of PDAFF and District Agriculture Offices. Staff members of the survey provinces have had experience of survey organization. Intensive communication with the survey provinces was ensured before the survey. This was essential for, inter alia, the identification of enumerators for the survey. A fieldtrip to ten survey provinces were

also organized. Staff members of Statistics Office of Department of Planning made short field visits to the survey provinces to make arrangements for the surveys. The participants of the field trip held discussions at the provincial offices.

The survey was conducted in one round and the Statistics Office controlled overall operation of the survey. Eight staff members of Statistics Office were specifically assigned for the supervision of work in the field. Project vehicles (cars and motorcycles) were used for supervision and monitoring of fieldwork. At the provincial level, two provincial staff assigned for APIP shouldered the responsibility of training, survey operation, organization of enumeration and fieldwork supervision.

Arrangements at the field level were essential for the success of survey. Provincial level staff members or district staff assigned by them were the main enumerators. Enumerators were provided with training, list of villages to be covered, questionnaires and the instructions for completing the questionnaires. Statistics Office supported the provincial staff with DSA and mobility provisions.

Processing of Data

Survey data were entered, cleaned and analyzed using Microsoft Access. Two database files were created: one for paddy and another for soybean. For paddy, three separate tables were formed to store data from province, village and household questionnaires, respectively. In the case of soybean, the number of tables was only two (for two types of questionnaires). Data were entered into these tables directly. "Query" of Access was used for the cross-checks, cleaning, and analysis.

Rice

Database created was: CPS_RICE_ALL_DATA.mdb. Three tables were formed in the case of paddy:

CPIR for FORM CP 1R : Provincial Questionnaire
CP2R for FORM CP2R : Village level Questionnaire
CP3R for FORM CP3R : Household Questionnaire

Two additional tables were formed:

i) ADByTypeMethod table contains AD by TM with the following classifications:

SB	Seed and Seedbed preparation
CL	Cultivation and land preparation
TR	Transportation
TH	Threshing or related operation

ii) MDByTypeMethod table contains MD by TM with the following classifications:

SB	Seed and Seedbed preparation
CL	Cultivation and land preparation
CM FR	Compost
TP CH	Fertilizer
WD HR	Transplanting (or Direct seeding)
TH	Crop and water management
	Weeding
	Harvest and stack
	Thresh, window and bag

Soybean

Database is CPS_SOYA_ALL_DATA.mdb

Two tables were formed in the case of soybean:

CP2S for FORM CPIS: Village Level Questionnaire

CP3S for FORM CP2S: Household Questionnaire

Calculation of Cost and return for paddy (per ha)

- Data on AD and MD are taken from Village Questionnaires
- AD and MD rates are also taken from Village Questionnaires
- Most of other data are from Household Questionnaires
- Farm-gate Price = Selling price per kg – Transportation cost per kg. Cost of AD per ha = (AD per ha) * AD Rate
- Cost of MD per ha = (MD per ha) * MD Rate

Gross Revenue = Yield * (Farm-Gate price)

Variable Cost = Cost of (AD + MD + Seed + Fertilizer + Insecticide + Irrigation + Rented Thresher)

Net Return = Gross Revenue – Variable Costs

3.3. Metadata for Each of the Major Administrative Register

Administrative Structure and Enumeration Unit

Cambodia is administratively divided into 21 provinces and 3 municipalities. A province is further divided into districts which are further sub-divided into communes. The lowest administrative division is a village consisting of a number of households. At present, Cambodia has 21 provinces, 3 municipalities, 183 districts, 1, 609 communes, 13, 406 villages and over 2 million households. All of the geographical units have unique identity and generally have well-defined demarcations.

A village is the enumeration unit for MAFF data on crop area, crop production and number of livestock. Completed and quality reporting from over 13, 000 villages is not easy to achieve. However, neither DPS nor PDA has the mechanism to check the existence and quality of such reports from individual villages because only aggregated data are forwarded at each level of reporting.

Regular Reporting of PDA and Other Sources

Present land ownership in Cambodia has residual effects of the land distribution of 1980s when rural households acquired their land through Krom Samaki (a group of households within a village). Equitable distribution of agricultural land, mostly rice fields, was attempted. The ownership of a household ranged, at that time, from 1-4 ha of agricultural land. Land ownership of a household in a village depended on the population density of the village, availability of rice fields/area and the quality of rice field.

The accuracy of the area measured by "old system" is generally questioned. In fact, some discrepancies were found when land area was sold or otherwise disposed (eg. as gift). The ownership pattern per household (and per person) shows signs of downward trend, especially because of the changes in household numbers and sizes. Possibly because of this, clearing and use of marginal land for cultivation is also coming up. However, besides all these, compared to many developing countries in the world, agricultural land ownership of farmers in a given area exhibits considerable homogeneity.

Village chiefs assess the area under and production of different crops in the villages under their command. Main basis of total crop area for a village is the old norm of ownership of land. Normally, quantitative assessments of crop area and production made by village heads are based on:

- a. old norm of land area;
- b. the number of households in the village now/before;
- c. assessment of crop coverage and cropping pattern in the season concerned;
- d. local knowledge of crop condition; and
- e. assessment of yield of crops.

However, above approach may differ from place to place, and there is an urgent need to devise and adopt a uniform approach. For example, in some places, households use marginal land for cultivation and only rough assessment of such land uses can be made by village authorities. Land ownership of all kinds is not accounted in the records of the village chief. Assessment of area under dry season crop has become increasingly difficult due to year-to-year crop shifts and intensification. Complete and quality reporting from all villages is difficult to achieve.

Still, most village chiefs assess that the area, production and assessment is much better in quality than the data on livestock numbers and production. This observation

is probably true because area of assessment unit (village) is not that vast for crop data, especially because of their knowledge of 1980s system of land distribution and rainfall situation, cropping calendar, cropping pattern and crop condition in the running season.

Besides regular reporting of PDA, other data published by DPS include data on fisheries, rubber, forestry, agricultural materials, and agricultural machinery. Such data are collected from relevant technical departments/agencies.

Livestock and Fisheries Statistics

For livestock statistics, main items of interest to MAFF, DAHP and other users are livestock numbers, number of livestock slaughtered, and meat production.

For estimation of numbers, an integrated household sample survey is recommended to be undertaken by DPS. It is difficult for a sample survey to account for slaughtering done in all possible sources (slaughterhouses, butcheries, households, villages, and community). Hence, as regards to assessment of livestock production and slaughtered animals, following recommendations are made: a) use of a small-scale sample survey of abattoir/butchery for estimation of meat per a slaughtered animal, and b) use of secondary sources for assessment of national meat production and the number of slaughtered animals. This is a cost-effective and prudent way.

Production data on fisheries are also adjudged to be unreliable but resources available do not permit support to the collection of fisheries data from primary sources. Hence, secondary sources of data should be used to assess fish production also.

Dissemination of Data

DPS is the main agency responsible for publication and dissemination of agricultural data. Dissemination of data has been seriously constrained by lack of resources. Flow of information to and from PDA needs improvement. Dissemination of agricultural price produced by Agricultural Marketing Office and NIS should be intensified.