



GCP/RAS/171/JPN  
Field Document No. 2/IRA

IMPROVEMENT OF AGRICULTURAL STATISTICS  
IN ASIA AND PACIFIC COUNTRIES  
(GCP/RAS/171/JPN)

**General Status of  
the Food and Agriculture Statistics  
in Iran**

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS  
BANGKOK, 2002

This publication is produced by

**The FAO Regional Project**  
**For the Improvement of Agricultural Statistics in Asia and Pacific Countries**  
GCP/RAS/171/JPN

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## **I. INTRODUCTION**

This document was prepared by the FAO regional project "Improvement of Agricultural Statistics in Asia and Pacific Countries" (GCP/RAS/171/JPN) and the Agricultural Statistics and Information Department (ASID) of the Ministry of Agriculture (MOA) in Iran, for identification of the current status, systems, issues and future improvement on agricultural statistics in Iran.

To achieve this purpose, the Project implemented an In-depth Review on the food and agriculture statistics in Iran on February 2001, and requested the ASID to compile technical papers on the various fields of the food and agriculture statistics based on the obtained knowledges of the In-depth Review.

The ASID identified appropriate resource persons for compilation of the technical papers. Total eight technical papers were made to;

- assess the state of national food and agricultural statistics service;
- review existing food and agricultural statistical activities;
- identify demands of/and expectations from data users; and
- discuss problems, issues faced in the collection, analysis, use and dissemination of food and agriculture statistics.

The technical papers were expected to be measures for improving or streamlining food and agriculture statistics to generate a programme on future improvement plan through identifying data gaps, deficiencies in methodologies, duplication of efforts/activities.



## **II. GENERAL STATUS ON THE SYSTEM OF FOOD AND AGRICULTURE STATISTICS IN IRAN**

### **1. The organization concerning agricultural statistics**

Iran adopts a decentralized system in agricultural statistics. Different governmental departments undertake statistical activities individually in the areas of which they are responsible. The Ministry of Agriculture (MOA), the Ministry of Jihad-e-Sazandegi (MOJ) - responsible for rural development - and the Statistical Centre of Iran (SCI) were the three major organizations for food and agricultural statistics. Recently, there was a plan to combine the MOA and the MOJ into one ministry according to the decision of the parliament. (at the present, the integration has been done. New ministry is named Ministry of Jihad-e-Agriculture.)

Generally, the MOA took charge of the crop survey and cost of production survey for main crops. The MOJ took charge of livestock, fishery and forestry surveys. The SCI is responsible for the Agricultural Census and national aggregates.

Furthermore, there is the High Council of Statistics. The roles of the Council are to formulate the general policies for the state's statistical programs and to coordinate activities among ministries and state-run institutions.

### **2. Agricultural statistics of the Ministry of Agriculture (MOA)**

The Agricultural Statistics and Information Department (ASID) was the only principal agency in the MOA which was responsible for collection, compilation and publication of all current agricultural statistics. This department was established in 1981 under the Secretary of Planning and Budget.

Agricultural surveys of which the ASID is in charge, were crop survey and cost of production survey for main crops.

#### **2.1 Crop survey and Cost of production survey**

The ASID of the MOA conducted crop survey and cost of production survey for (i) rice, (ii) wheat & barley, and (iii) other annual crops, on an annual basis .

##### **(a) Survey Items**

The survey items of the crop surveys were mainly concerned to production of crops such as planted area, yield, production, input of machinery and agricultural chemicals, etc. The cost of production surveys estimates the cost per hectare for the crops.

(b) Survey Design

The ASID took survey designs *stratified two stage sub-sampling* for crop survey and cost of production survey. The survey designs were done for every survey category, as (i) rice, (ii) wheat & barley, and (iii) other annual crops.

The crop surveys were designed to keep 95 % precision of sample selection at township level, while the cost of production surveys keep 95 % precision of sample selection at provincial level.

(c) Stratification

The primary sampling units (psu) were villages which were stratified into 5 to 7 strata based on the total area under cultivation of related crops in the latest agricultural census. The secondary sampling units (ssu) were the farm households which were listed in the sample villages. The lists of the farm households in the sample villages were renewed every year.

(d) Sample allocation to the psu

The optimum allocation was used. Minimum two samples were allocated to each psu in spite of calculated theoretical numbers.

(e) Sample allocation to the ssu

The samples allocated to the psu were reallocated to the ssu. For the large scale stratum, all households were selected. For the general strata, 10 % of sample households were selected by random systematic sampling from the list. The sample farmers of the cost of production survey were the sub-sample of the crop survey.

Sample numbers were variable due to the reselection of samples every year taking into account of knowledge of the previous year.

## **2.2 Survey on permanent tree crops**

Surveys for permanent tree crops were undertaken through subjective and non-probability method.

Following is a sample numbers and timing of the surveys conducted by the ASID.

**Table 1** Sample Size for Surveys Conducted by the ASID

	<b>Sample Villages</b>	<b>Sample Householders</b>	<b>Timing of the Surveys</b>
<b>Crop Survey</b>			
Wheat & Barley	4,500 - 5,000	20,000 - 30,000	July/Aug.
Rice	900 - 1,000	2,000 - 5,000	Nov./ Dec.
Others temporary crops	4,500 - 5,000	25,000 - 35,000	Nov./ Dec.
<b>Cost of Production Survey</b>			
Wheat & Barley	Same as above	13,000 - 16,000	Same as above
Rice		2,000 - 2,500	
Others temporary crops		15,000 - 20,000	
<b>Survey on permanent tree Crops</b>	Collection of	Information	Feb./March

### 2.3 Data collection

All sample farmers were interviewed by district level officers using the multipurpose questionnaires for the crop survey and the cost of production survey. The ASID of the MOA was comprised of central and local organization. The structure of administrative divisions and local organizations of the ASID is the following

**Table 2** Local Organizations of the ASID

<b>Administrative Divisions</b>	<b>MOA</b>
State	ASID
Provinces (28)	Office of Statistics & Computer in Provincial Agricultural Organizations (29)
Townships (282)	Statistics Office in Agricultural Management (282)
Districts (724)	Centre for Agricultural Service (around 1,000)
Villages (100,000 and more)	---

Note: the figure in the ( ) is number of the organization.

There were several full-time statistical officers in provincial office, while at least one officer took charge of the computer and data processing. In the township office, there was one full-time officer in charge of statistics. His main task was data entry of the survey result in the computer system. In the district office, one officer played a role of the enumerator of the surveys, however he held additional concurrent responsibility.

In case of the Gazvin Province where is near to the capital, there are around twenty officers concerning statistics in provincial level office. They give instruction to the offices in township and district level offices under their jurisdiction, implemented data check reported from lower offices, and arranged the surveys' result to be reported to the ASID. Under the provincial office, there were three township offices and 23 district offices covering 928 Villages, around 67,000 farm households. Sample size of the crop survey for wheat & barley were about 700 farm households in 87 sample village (average 9 holders/ village). Crop survey for other crops had the same sample size. Rice was not planted in this province. Cost of production survey used same sample villages but sample farm households were smaller than crop survey.

## **2.4 Data processing and dissemination**

The data processing system had been computerized. Data input and check were done at provincial level.

Besides the release of the results in printed format, efforts had been made to make them available through magnetic media (such as FD and CD-ROM), facsimile communications and the Internet.

## **2.5 Other activities on agricultural statistics and information**

### **(a) Ad-hoc survey**

Sometimes, the ASID organized special non-regular surveys by the request of technical divisions of the MOA. For example, in 1999, a special survey for potatoes and onions was undertaken. It was a list sample survey involving objective measurements of areas and yields.

### **(b) Market information**

Retail and wholesale market prices of major markets in provinces were collected by rural cooperative organizations and disseminated every two weeks.

### **(c) Crop production forecasting and disaster survey**

Although divisions of extension and plant production collected subjective information from provincial level, it was not systematic. The ASID had a plan to reinforce the activity organizing three times per year at the time of cultivation, planting and pre-harvesting in the future. Technology of remote sensing would be considered to adapt the forecasting.

## **2.6 Information Technology system of the ASID**

The ASID had a Computer Division and a Remote Sensing and GIS Division. The both divisions played active part in terms of utilization and analysis of the statistical data.

The Computer Division took charge of not only data processing of the statistical surveys but also all of the Information Technology system as follows;

- data processing for statistical surveys including sample selection and tabulation;
- administration of LAN and Intranet system in the ministry;
- maintenance of data bank system and Internet web site; and
- instruction for the Information Technology system in local offices.

The Remote Sensing and GIS Division has done various kinds of study in the field of agriculture, and the division were doing the following :

- preparation of land use/cover maps for different provinces based on visual and digital interpretation of satellite data;
- crop acreage estimation using Remote Sensing data;
- development of local GIS to be used by provincial organizations;
- development of crop forecasting systems; and
- updating available maps and preparation of different data base layers for GIS.

## **3. Statistical activity of the MOJ**

Formerly, only the SCI and the ASID of the MOA were official organizations in terms of agricultural statistics. Since 1978, the MOJ commenced its statistical activities in the field of livestock, fisheries and forestry as well as rural area developments. The Bureau of Information was the responsible division in the MOJ.

Mainly, surveys were undertaken through subjective and non-probability method using their own local offices. However, for several livestock surveys, the Bureau of Information has introduced sampling method receiving technical cooperation from the SCI.

## **4. Agricultural statistics of the SCI**

The SCI was established in 1965 and is one of the government agencies with a departmental status under the office of Government organization on planning and management.

The SCI is responsible for:

- conducting all censuses including agricultural census;

- national aggregate;
- compiling national accounts;
- providing statistical fundamentals and frames to other organizations;  
and
- giving technical advice to the statistical units of ministries, government agencies, etc.

#### **4.1 Agricultural Censuses in IRAN**

The SCI has conducted Agriculture Censuses three times in 1973, 1988 and 1993. The fourth census of Agriculture was scheduled to be implemented in 2003.

In 1993, the third census was conducted for all agricultural householders and villages. The censuses gathered data on structural aspect of agricultural holdings including land use trend, crops production, livestock inventory, apiculture, sericulture, aquaculture, machinery utilization, etc.

The definition of agricultural holdings was as following;

- Utilization of 400m<sup>2</sup> or more area for temporary crops; or
- Utilization of 200m<sup>2</sup> or more area for permanent crops; or
- 2 heads of sheep or goat; or
- 5 chickens or ducks.

Holding list of the census was made before census enumeration. Agricultural householders were identified by visiting their ordinary place of residence, and recorded in a complete listing form.

Enumerators of the census interviewed agricultural householders and well educated local persons using Complete Listing Form, Holding Questionnaire and Village Questionnaire.

### **III. TECHNICAL PAPERS PRODUCED BY RELEVANT OFFICIALS IN IRAN**

#### **A. OVERVIEW OF AGRICULTURE AND AGRICULTURAL STATISTICS IN IRAN**

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#### **1. Overview of Iran's Agriculture**

##### **1.1 Geographical characteristics**

Iran has a land area of over 1.6 million sq. km. It lies in the northern temperate zone, between 25 00' 00"-39 47' 00" N latitudes and between 44 02' 00"-63 20' 00" E longitudes. Its average elevation is over 1200 metres. The lowest place, located in Chalet-loot, is only 56 metres high, while the highest point, Damavand peak in Alborz mountains, rises as high as 5610 metres. At some points of the southern coastal strip of the Caspian Sea, land height is 28 metres below sea level.

##### **1.2 Climate**

The country has three climatic zones:

Arid/semi-arid regions of the interior and far south which are characterized by long, warm and dry periods, lasting sometimes over seven months. The annual precipitation in such regions varies between 30 and 250 mm.

Mountainous extensions which are in turn divided into cold and moderate mountainous regions:

- Cold mountainous regions: About 40 000 sq. km of the total land consists of major highlands, including Alborz and Zagross mountain ranges, as well as Sahand and Sabalan high peaks. The annual precipitation in these regions exceeds 500 mm.
- Moderate mountainous regions: some 300 000 sq. km of the country enjoy moderate mountainous climate, where the annual precipitation varies from 250 to 600 mm.

The Caspian region, which is a narrow strip with a limited extension, trapped between the Caspian Sea and Alborz Mountains, with as much as 600 to 2000 mm precipitations per annum.

### **1.3 Agricultural organization**

The Ministry of Jihad-e-Agriculture is the result of merging ministries (the former ministries of Agriculture and of Jihad-e-Sazandagi). It is responsible for managing agricultural activities including fishery and forestry.

The local offices of the ministry are as follows:

- Provincial level: the 28 provinces each have one office responsible for managing agricultural activities, the Jihad-e-Agricultural Organization, and one office responsible for forestry and rangelands, the General Office for Natural Resources, and in 16 provinces there is an office responsible for fishery activities, the General Office of Fisheries. For the remaining provinces there are smaller offices in charge of fishery activities.
- Subprovincial level: the 282 subprovinces each have one office responsible for all the agricultural activities, namely the Jihad-e-Agriculture Management.
- County level: the 900 counties each have an office responsible for managing agricultural activities, namely the Centre of Agricultural Services.

### **1.4 Agricultural characteristics**

The 1993 agricultural census accounted for 3.6 million holdings, of which 2.8 million with cultivated land and 0.8 million without cultivated land. The total cultivated area is 120 000 sq. km, of which 46 percent are irrigated and 54 percent rainfed. The total area of forest is 100 000 sq. km and of rangeland 900 000 sq. km. Deserts and mountains cover 568 000 sq. km, which is about one third of the country.

The average size of holdings in the irrigated sector is around 2.93 ha, and 6.41 ha for the rainfed sector.

A large portion of the production of the main temporary crops comes from irrigated areas. Wheat and barley are distributed quite geographically, except in the north of the country. Rice, mainly in the north, is almost totally irrigated. Potatoes and tomatoes are mostly irrigated. Peas and watermelon are rainfed.

Broadly speaking, Iran's agriculture has three main branches of economic activity, namely agriculture (including livestock), forestry and fishery.

Agriculture plays a significant role in the national economy; in 1998 more than 23 percent of the labour force was engaged in the agricultural sector. The latter accounted for 23 percent of the Gross Domestic Product, and more than 25 percent of export (except oil) income is from agriculture in terms of value. The sector produces more than 80 percent of the food requirement of the country, and 90 percent of the raw material of agroindustries is maintained by this sector.

The main characteristics of Iran's agriculture are small-scale production and dispersal of households. Agricultural production is mainly self-sufficient. Concentrated large-scale production is not much developed. Mixed culture is usual. This state of affairs makes statistics gathering difficult.

In view of the importance of agriculture, the availability of reliable and timely agricultural statistics becomes extremely important for policymakers, agricultural producers, traders, consumers, exporters and importers for effective planning and management, whether it relates to production, marketing, consumption, processing, export or import.

## **2. Overview of the System of Food and Agriculture Statistics**

### **2.1 Historical background**

The first centralized statistical institution of Iran was established in 1952, under the name of General Department of Public Statistics (GDPS) affiliated to the Interior Ministry. The formal statistical activities started in 1953. GDPS worked in a very centralized manner; employees were appointed to go to provinces in order to conduct statistical surveys prepared in the capital and all the documents were delivered to the central office. GDPS implemented the first agricultural sample survey in 1960 in 7000 rural places, the results of which were manually processed and published in a series of statistical reports. GDPS was detached from the Interior Ministry and merged into the Statistical Centre of Iran (SCI) affiliated to the Planning and Management (formerly Planning and Budget) Organization (PMO) in 1965.

## **2.2 Organization of food and agriculture statistics in Iran**

In Iran, food and agriculture statistical activities are conducted under a decentralized system, which means that different governmental organizations undertake statistical surveys in the areas for which they are responsible.

Until 2000, the following three main organizations were involved in food and agriculture statistics in Iran:

- The Statistical Centre of Iran (SCI)
- The Ministry of Agriculture (MOA)
- The Ministry of Jihad (Fishery, Forestry and Livestock) (MOJ)

Now MOA and MOJ have joined together and formed a new ministry called the Ministry of Jihad-e-Agriculture (MOJA).

Furthermore, there is a High Council of Statistics. HCS formulates the general policies for the state's statistical programmes and coordinates activities among ministries and state-run institutions.

### **2.2.1 The Statistical Centre of Iran**

The Statistical Centre of Iran (SCI) was established in 1965. Since its establishment all the other institutions of the country have been prohibited from conducting identical and repetitive surveys. In order to develop and expand the statistical network, SCI branched out in 48 places throughout the country in 1966 but gradually concentrated them in 23 larger provincial offices by 1970. All statistical surveys plans were prepared on a centralized basis by SCI until 1979, but were conducted in a decentralized manner through its branches in provinces. After the Revolution in 1979, basic and fundamental transformation of the statistical system was considered quite necessary.

Under the new statistical system, the statistical organizations had to have a closer and stronger relationship with the planning institutions. Therefore the branches were integrated in the planning and budget bureaus of PMO in the provinces in terms of their administrative and financial affairs. These offices of assistants maintain technical relations with SCI and are responsible for the implementation of statistical surveys in their own provinces.

In 1991 some changes were introduced into the central organization system of SCI, due to an expansion of its activities; that is, in addition to Deputy for Statistical Projects, Deputy for

Data Processing and Deputy for Executive and Administrative Affairs, another Deputy was appointed for Research and Development.

The SCI organizational chart is given as Appendix I at the end of this paper. Based on this chart, there is the Agricultural Statistics Department under the Deputy for Statistical Projects.

Some of the main functions and authorities of SCI are as follows:

- Implementing the national census and sample surveys in economic and social fields.
- Preparing and updating statistical frames.
- Compiling the national accounts and price indices.
- Establishing statistical definitions, concepts, criteria and classifications.
- Giving technical advice to the statistical units of ministries and government agencies as well as those of the private sector to the extent possible.
- All ministries, government agencies and government companies are bound to follow in their surveys the definitions, concepts, methods, criteria and classifications established by SCI.
- Ministries, government agencies and government companies are bound to supply SCI with any information which it deems necessary, through the implementation of current surveys.

The main activities of SCI in the field of agricultural statistics are as follows:

### **Nationwide censuses of agriculture**

The first agricultural enumeration at the national level was conducted as a sample survey in 1960. The first census of agriculture was taken in rural areas in 1973 and questionnaires were completed for every village by interviewing the local informed people. The 1988 countrywide census of agriculture was the first “general” agricultural census. In this census, all agricultural holdings were enumerated through direct visits to every household living in urban and rural areas as well as every unsettled household; and holdings belonging to legal persons were enumerated through local places where agricultural activities were being practised.

SCI conducted another census of agriculture in 1993, which covered all rural and urban areas where agricultural activities were being practised. The results of this census are processed on a decentralized basis for the first time in each province.

The fourth agricultural census is scheduled to be run in 2003.

### **Ad-hoc enumeration**

In addition to regular censuses and sample surveys, SCI has conducted a number of subject-matter censuses and sample surveys on an ad-hoc basis to meet the requirements of agricultural statistics users, as follows:

- Socio-economic census of nomadic tribes
- Survey of agricultural activities in rural areas
- Survey of farming
- Horticulture survey
- Livestock survey
- Survey of industrialized cattle establishments
- Chicken farm survey
- Census of chicken farms
- Census of breeding chicken farms
- Census of layer chicken farms
- Retail price survey of consumer goods services in rural areas
- Survey of farm-gate prices and cost of agricultural services in rural areas

### **Miscellaneous activities**

- Statistics on livestock slaughtered in slaughterhouses
- Development and publication of national account data
- Preparation of input-output tables
- Preparing good maps for statistical works

Furthermore SCI has also implemented some ad-hoc sample surveys on livestock and fishery, mostly in collaboration with MOJ since 1990.

## **2.2.2 Ministry of Agriculture (MOA)**

In the Ministry of Agriculture, the main department responsible for the collection, compilation and publication of all current agricultural statistics is the Agricultural Statistics and Information Department (ASID), established in 1981 under the Secretary of Planning and Budget. A few other agencies affiliated to the Ministry of Agriculture also gather data in their fields of responsibility.

Before the establishment of ASID, the Economic and Statistics Department gathered agricultural statistics through reporting received from the agricultural head offices in the provinces. In 1981 the statistics division was attached to the Computing Service Office and renamed ASID.

The main responsibilities of ASID are as follows:

- Collection, dissemination, classification, processing of agricultural statistics required by the users.
- Preparing subject-matter statistical sample surveys in related fields at national and sub-national levels.
- Preparing and formulating training materials for related statistical surveys.
- Directing the execution of related statistical surveys.
- Cooperating with SCI in preparation and implementation of agricultural censuses.
- Monitoring and evaluating countrywide agricultural statistics activities in the provinces.

ASID has central and provincial agencies. The central organization chart is given in Appendix II. In each of 29 provinces, within the Jahal-e-Agriculture Organization, there is an office called statistics and computer office.

In addition to implementing the survey and compiling the results for their prefectures, the provincial offices provide instruction to the prefecture offices under their jurisdiction, and report to the central office (i.e. ASID).

In each subprovincial office there are at most two persons engaged in agricultural statistics activities planned and supervised by the statistics office in the affiliated province.

Also in each Agricultural Service Centre at county level an enumerator is designated to collect the data under the supervision of a person at the subprovincial level.

The main activities of ASID in the field of agricultural statistics are as follows:

### **Countrywide current surveys**

Since 1988 ASID has carried out four main yearly probability sample surveys as follows:

#### ***- Wheat and barley***

The implementation of this survey starts in June and finishes in July throughout the country. The main objective of the survey is to estimate the area and production for irrigated and rainfed lands at subprovincial level. The sampled population is comprised of all the villages with a population of less than 5000. The latest agricultural census is used to prepare the frame.

- ***Paddy rice***

The implementation of this survey starts in July and finishes in September in the six provinces that have the biggest producers of this crop. The main objective of the survey is to estimate the area and production at subprovincial level. The sampled population is comprised of all the villages with a population of less than 5000. The latest agricultural census is used to prepare the frame.

- ***Other annual crops***

The implementation of this survey starts in October and finishes in December throughout the country. The main objective of the survey is to estimate area and production for irrigated and rainfed lands at subprovincial level. The sampled population is comprised of all the villages with a population of less than 5000. The latest agricultural census is used to prepare the frame.

- ***Crop production cost***

This survey is implemented simultaneously with each of the three surveys mentioned above. The main objective of the survey is to estimate the share of production costs at different stages, from land preparation to the end of harvesting, for irrigated and rainfed lands where it is appropriate. The estimates are at provincial level. The sampled population comprises all the villages with a population of less than 5000. The latest agricultural census is used to prepare the frame.

**Survey methodology**

For these surveys, a common two-stage systematic stratified sample design is used as follows:

- In the first sampling stage, villages are stratified into 5 to 7 strata based on relevant auxiliary variables from the latest agricultural census. The total sample size (n) is determined by two factors, namely, required accuracy and costs. The optimal (Neyman) allocation is used to assign sample size to each stratum. Systematic sampling is used to select villages within each stratum.
- In the second sampling stage, a list of farm households is prepared for each selected village. Then 20-30 percent of farm households are randomly selected from the list.
- All sample farmers are directly interviewed, using multipurpose questionnaires.
- For the production cost survey, the sample consists of a subsample of farm households from the previously selected sample of farm households used in the previously mentioned surveys.

### **Ad-hoc surveys**

In addition to regular censuses and sample surveys, ASID has also conducted a number of subject-matter censuses and sample surveys on an ad-hoc basis to meet the requirements of agricultural statistics users as follows:

- Probability surveys to estimate crop area of sugarbeet in certain provinces, in collaboration with the relevant department.
- Probability surveys to estimate crop area and production of potato and onion in almost all provinces, in collaboration with the relevant department.
- Crop area estimation for some crops in some provinces using estimates derived from satellite data.
- Crop yields forecasting for some crops in one province using estimates derived from satellite data.

### **Non-probability surveys**

- For perennial crops the data about the area and the productions are gathered through the reporting system.
- The agricultural market prices retail and wholesale are gathered at provincial level every two weeks. The results of these surveys are disseminated at provincial level. This activity is carried out by the Rural Cooperative Organization affiliated to the Ministry of Agriculture.
- Production forecasting for main crops such as wheat and rice is made through a reporting system before harvesting time. The Agronomy Deputy Minister affiliated to the Ministry of Agriculture does this.

## **2.2.3 Ministry of Jihad (MOJ)**

Soon after the Revolution, an organization of volunteers was established to help the people living in villages and engaged in agricultural activities. In order to fulfil this job, a survey of the villages was prepared in 1981. The organization then became the Ministry of Jihad (MOJ). The Ministry of Agriculture's responsibilities over livestock, fishery and forestry were given to MOJ. The Bureau of Statistics in MOJ is responsible for managing statistical activities. There is no integrated survey programme for data collection. Almost all the data are obtained through the reporting system of the local organizations in the provinces. For the fishery data, the Fishery Organization has implemented some sample surveys, with technical assistance from SCI. For forestry and rangeland data, the Forestry Organization has carried out some ad-hoc sample surveys based on satellite data. For livestock, some ad-hoc surveys have been implemented in collaboration with the Livestock Organization and technical assistance from SCI. SCI has

also carried out some surveys for livestock based on the Livestock Organization's demand.

The agricultural surveys conducted are as follows:

- Statistical survey of fish breeding centres for fish farms
- Statistical survey of fish farms
- Farm survey
- Statistical survey of cheese production units
- Statistical survey of natural and semi-natural water resources
- Statistical survey of broiler chicken farms
- Statistical survey of modern cattle farms
- Statistical survey of breeder chicken farms
- Statistical survey of hatchery units

### **3. Technical Cooperation from International Organizations**

#### **3.1 Crop forecasting**

In 1995 a research contract was signed with the International Institute for Aerospace Survey and Earth Sciences (ITC) to design and develop a proper method which can generate timely and reliable information on the area and production of the main agricultural commodities in the Hamadan province, and which could be extended to cover the entire national territory. As far as the area of agricultural commodities is concerned the result seems satisfactory. But this is not the case with production forecasting and estimation. A follow-up project with ITC is being considered to find models to obtain a more accurate estimation and prediction.

#### **3.2 New national programme**

In 2000, ASID requested a mission from FAO to advise on the establishment of a new national programme of current agricultural surveys based on a statistical survey model using multiple-frame methods. A proposal has been prepared for approval.

### **4. Organizational Problems, Issues and Constraints and Proposed Solutions**

- The countrywide sample surveys of food and agriculture statistics in Iran are technically centralized, under the management of ASID. One of the problems of the system is that training of personnel, workforce, budget and statistics activities are operated locally in the various provinces. Local authorities therefore guide the local statistical offices on some aspects, which tends to run counter to the principle of

independent and objective data collection. In fact, in order to satisfy the requirements of local officials, food production was overestimated by statistical offices in some provinces. The solution to the problem is to completely restructure the organization of the statistics system at the various levels.

- In each agricultural service centre there is only one person engaged in statistical activities and that person also has some other duties. As most surveys are conducted in these centres, enumerators have to be seconded from other offices, and some of them are not familiar with statistical work.
- Current sample surveys estimate information at either provincial or subprovincial level. But there is strong demand for information at county level. In order to cope with this situation, many localities have to conduct separate surveys or increase sample size, which is impractical due to budget and personnel constraints. This has led to too many complications and difficulties in data collection on planted area and production of crops.
- The paucity of the budgetary allocation for food and agriculture statistics is a big problem. Provincial and subprovincial offices have to request cars and additional funds from local authorities. Due to their dependence on local budgets and other facilities, local leaders have ruled the operations of some statistics offices and their independence and objectivity have been undermined. The solution to this problem is to set up norms of expenses for all surveys. Allocation of funds and all other required facilities should be emphasized.

## **REFERENCES**

**Agricultural Statistics and Information Department (2000).** Current activities in the year 1999. A Report to the Deputy Ministry of Agriculture in Planning and Budget

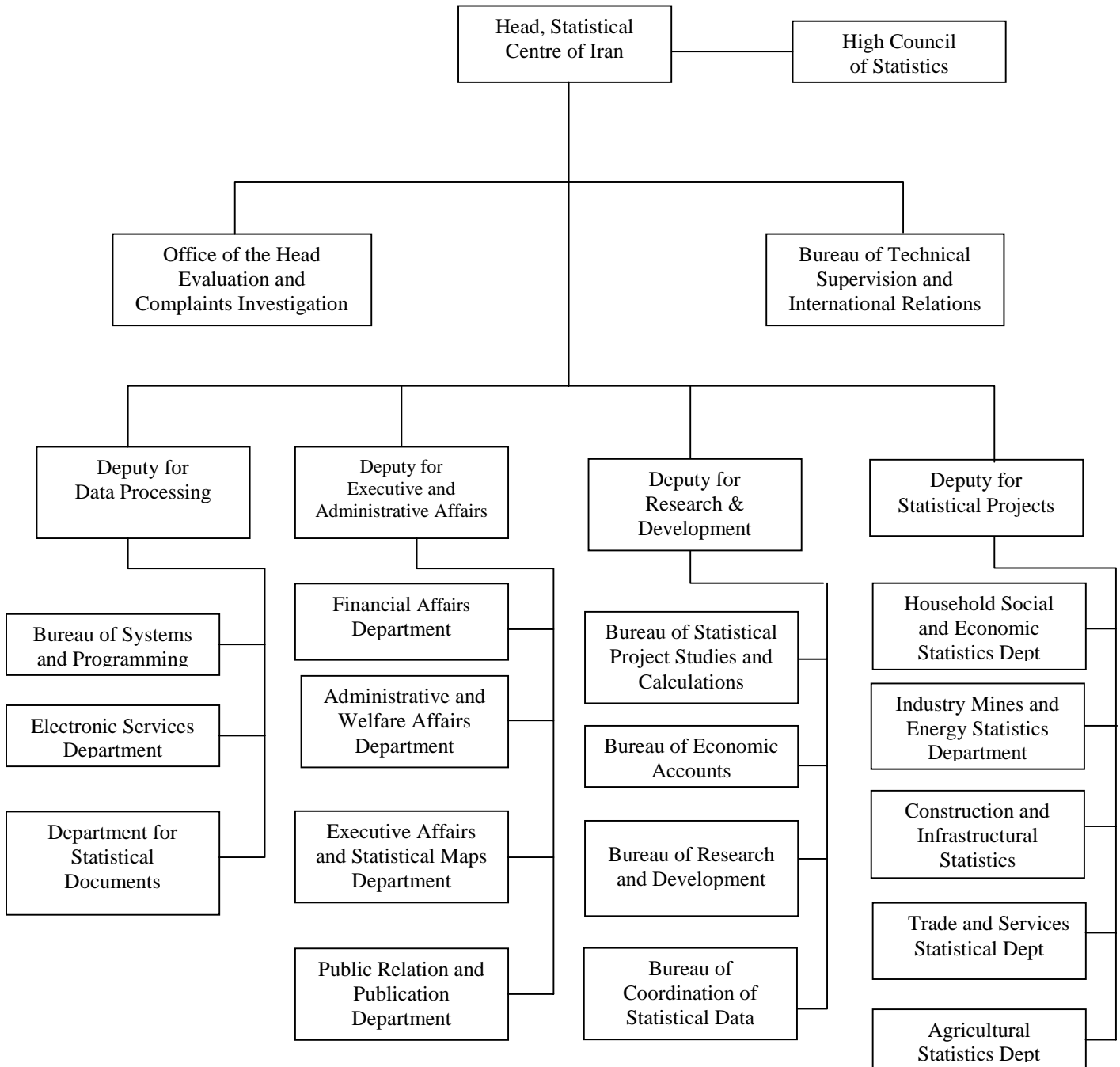
**Kheiri, G. (1998).** A Report on Statistical Activities in Agriculture, Forestry and Fisheries in Iran. Presented to the Seminar on Statistics in Agriculture, Forestry and Fisheries in Iran, 21-30 July 1998

**Statistical Centre of Iran (1999).** Agriculture Census in 1993. Detailed results

**Statistical Centre of Iran (2001).** A Guide to the Statistical Centre of Iran

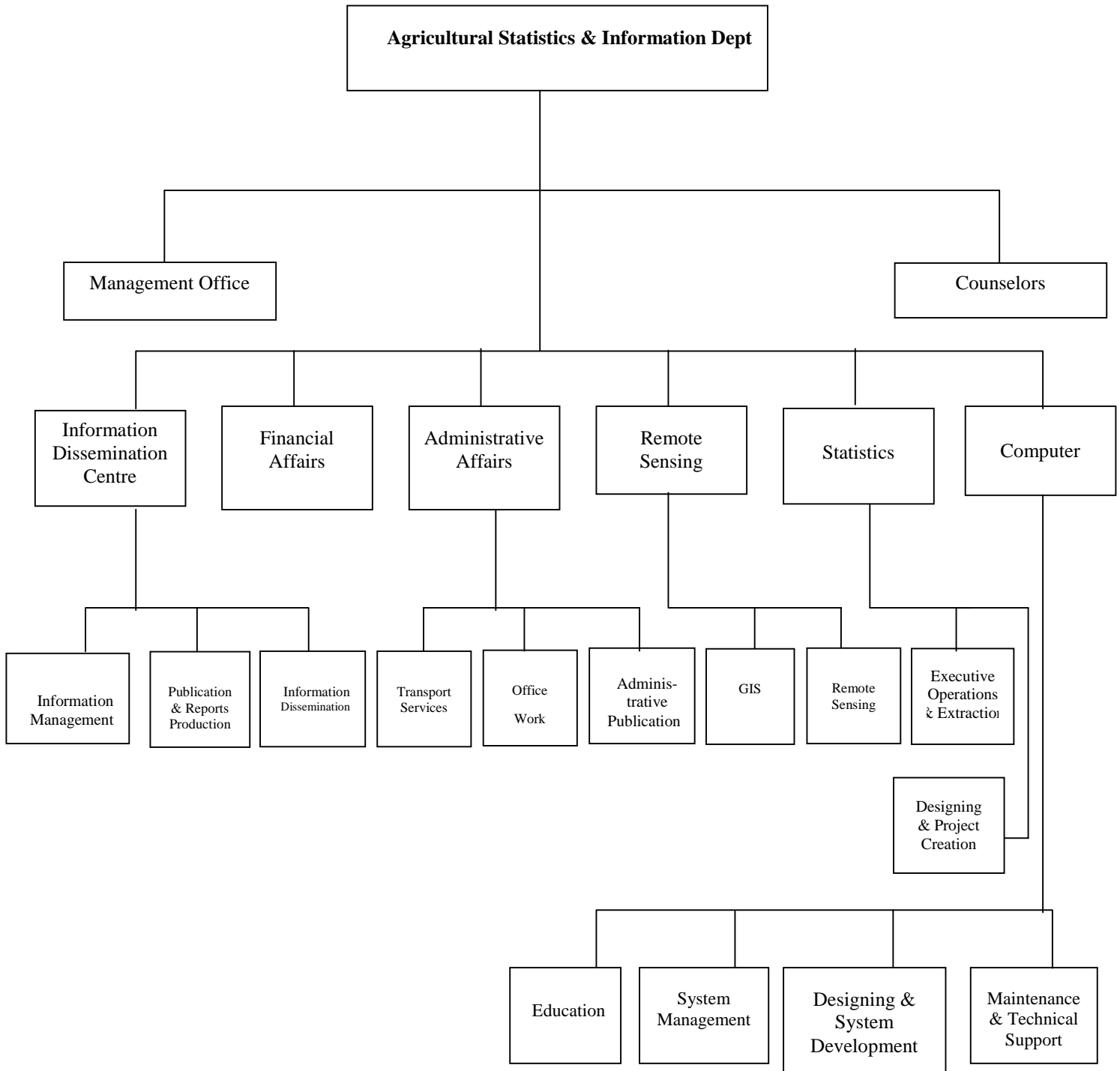
**Villalobos, A.G. (2000).** Report to Iran to Advise on the Establishment of a National Programme of Current Agricultural Surveys

**STATISTICAL CENTRE OF IRAN**  
**ORGANIZATIONAL CHART (PRESENT)**





**AGRICULTURAL STATISTICS & INFORMATION DEPARTMENT  
MINISTRY OF AGRICULTURE  
ORGANIZATIONAL CHART (PRESENT)**





## **B. METHODOLOGICAL REVIEW OF ACTIVITIES FOR THE NATIONAL CENSUS OF AGRICULTURE**

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This paper aims to clarify the actual condition of agricultural censuses in Iran. Through this report, historical outline, organizational structure, census publicity, legal basis, census methodology, census items, definitions, instructions and training, tabulation system, post-enumeration survey and main problems and constraints will be described.

### **1. Historical Outline**

The first countrywide agricultural survey was conducted as a sample survey in 1980. The plan for this sample enumeration had been developed taking into account international experiences presented by FAO in the programme for the World Census of Agriculture 1960.

The statistical unit of the survey was the agricultural holding as defined and explained in FAO documents.

The first census of agriculture was carried out in rural areas in 1973 and questionnaires were completed in every village by interviewing the local well-informed persons. The statistical unit for this census, for which data items were required, was the village.

The 1988 countrywide census of agriculture was the first general agricultural census. During this census all agricultural holdings were enumerated through face-to-face visits to each households living in urban or rural areas as well as unsettled households (tribes). Holdings belonging to juridical persons were also enumerated through local places where agricultural activities were being practised.

The government of Iran conducted another general census of agriculture in 1993, which covered rural and urban areas where agricultural activities were being practised.

Data gathered by census represent a precise documentation of the organizational and structural aspects of agricultural holdings on the land-use system, production trends, livestock inventory, machinery use, and other information on such activities as apiculture, sericulture and aquaculture.

During the period between censuses, changes occur in holdings and in the agricultural social structures; besides, progress in methodology and technique

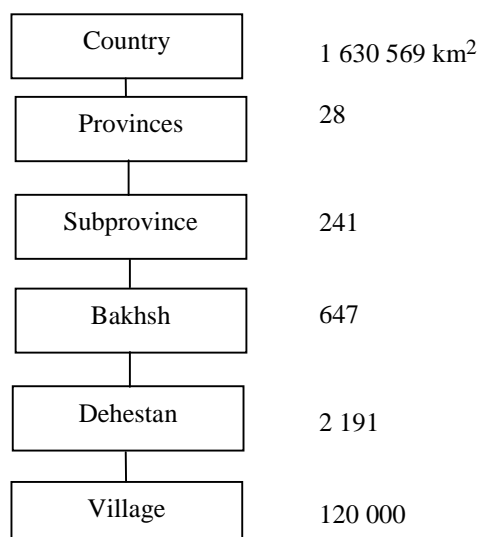
involves an adjustment in some of the definitions or concepts adopted for data culled from different censuses. However, using the same definitions related to the same aspects of agriculture and livestock holdings in all censuses allows for significant comparisons on the economic evolution of Iranian agriculture.

## 2. Organizational Structure

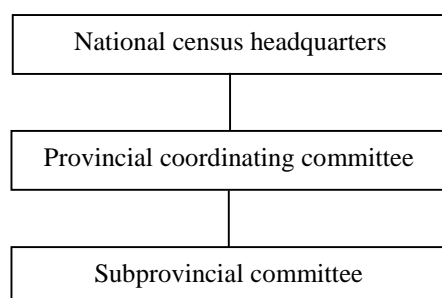
The Statistical Centre of Iran (SCI) is responsible, by law, for the censuses, including agricultural censuses. The programme of census, field operation, data processing, analysis and dissemination is assumed to be done by SCI.

The organization of an agricultural census, in general, is designed at three levels, based upon the following administrative divisions:

### Administrative divisions of the country

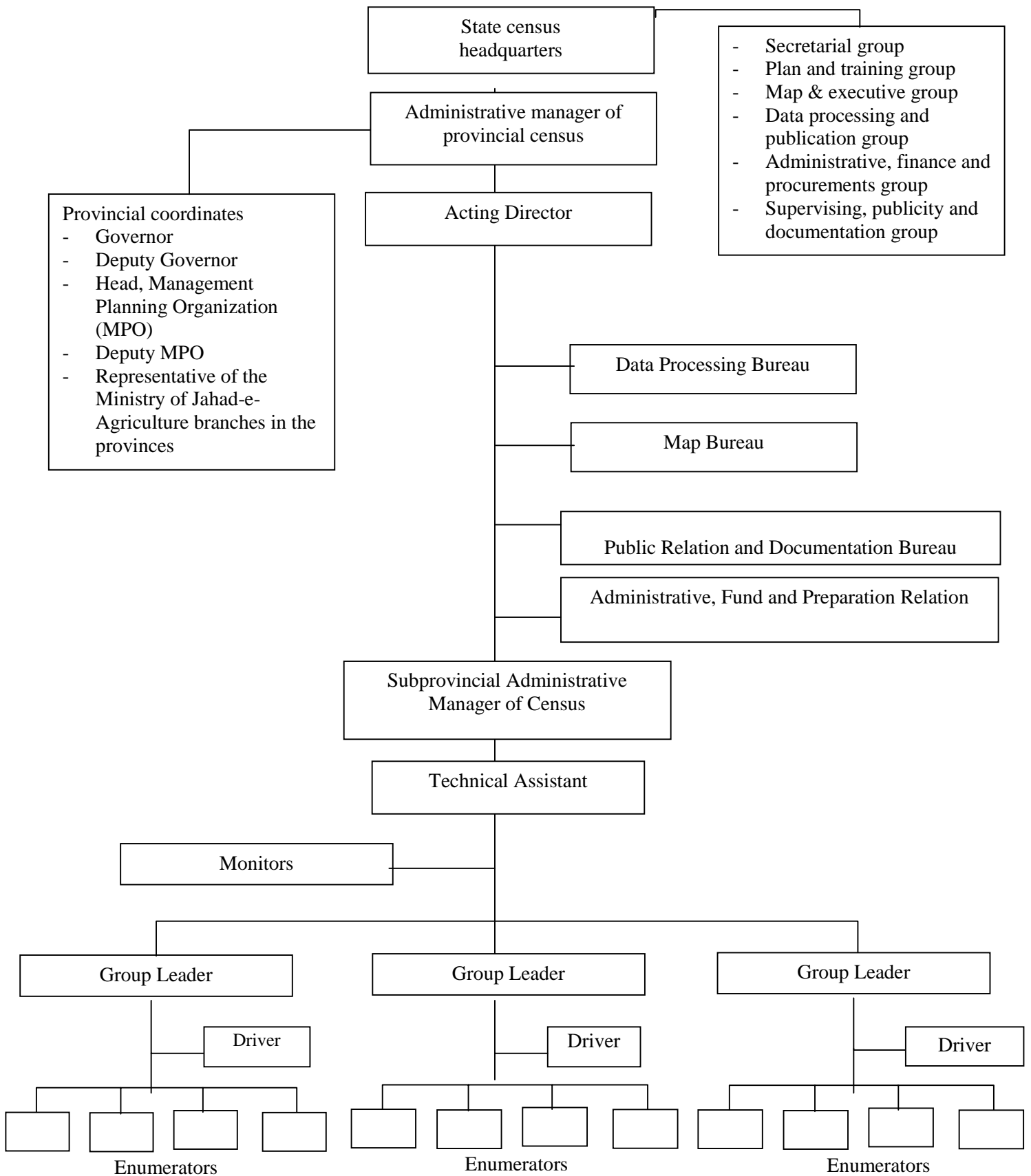


### Three levels of census organization



- a) The National Census Headquarters is established and facilitates, through the country, the regular and correct completion of the functional responsibilities. It also provides information on the aims of the census and promotes the census among the public.

## Organizational chart for the agricultural census 1993



- b) Provincial coordinating committees are established in each province to:
  - Indicate the regular and uniform application of the instructions provided by SCI for carrying out the census.
  - Maintain the correct and timely execution of duties on the basis of reports regarding operations compiled by the National Census Headquarters.
- c) Subprovincial committees established in each *shahrestan* (prefecture), including of enumeration groups.

Generally, each group consists of three or four enumerators with a group leader, a car and a driver.

### **3. Census Publicity**

Bringing census to the attention of all agricultural holders is the main purpose of publicity. The census publicity tries to explain the scope and coverage of the census. The publicity programme, in general, describes the uses of the data that will be collected, particularly for planning and formulation of agricultural policies, and emphasizes the confidential treatment of the data collected.

Through it, the farmers are encouraged for correct responses to the census questions. For the publicity activity, press, radio, television and posters are used as the main means, and the cooperation of religious leaders is sought.

#### **3.1. Legal basis**

The census of agriculture in Iran is always carried out according to an endorsement issued by the president. All censuses of Iran are taken, as far as possible, according to the recommendations for decennial programmes promoted by FAO.

#### **3.2. Methodology**

**Census objectives and uses:** The basic objectives of the censuses are to provide general information and more detailed data for small administrative units and to provide a frame for other agricultural sample surveys.

Most of the census items concern aspects of the agricultural structure. Analysis of the results of such items helps to clear the actual situation and scale of the agricultural economy.

The framework for other sample surveys on farms is obtained from the result of censuses. This frame is a list of holdings, and a list of villages or urban blocks with their main characteristics which helps, particularly for two-stage sample surveys, to identify farms households.

The government and the Islamic Consultative Assembly use the results of censuses to develop programmes and plan for the future. Many national and provincial programmes use census data to design and allocate funds for the extension of service projects, agricultural research. They are also used in universities. The private sector uses census results to provide more effective production.

**Statistical unit and coverage:** The agricultural holding is the statistical unit for the census. An agricultural holding is an economic unit of agricultural production under unique management without regard to title or legal form. Grazing land, forest and all land not operated by agricultural holdings are excluded from the censuses. The census covers agricultural holdings countrywide, including both rural and urban areas.

In the 1993 census of agriculture, a minimum size limit was adopted for holdings, only in to the following main groups:

- 400 m<sup>2</sup>, area for annual crops or
- 200 m<sup>2</sup>, area for perennial crops or
- 2 head of sheep or goats or
- 5 chickens or ducks or geese or turkeys.

**Reference date:** In two previous agricultural censuses, for some of the items such as land use, the time reference was the Iranian calendar year (which corresponds to 21 March to 20 March of the following year in the Christian calendar). For some other items such as number of animals, the time reference was the day of enumeration.

**Frequency:** Agricultural censuses in Iran are taken every ten years. This frequency is accepted by most Iranian statisticians.

**Duration:** To cancel out or reduce the volume of omissions and duplications in the information, such as changes in livestock numbers due to movements, the enumeration period is usually 30 days in October and November.

**Complete enumeration:** To meet the census objectives fully, complete enumeration is preferred. In this way it is possible to obtain information for every small geographic or administrative area. As mentioned before, provision of data for small areas and making the statistical framework are the objectives of all censuses of Iran. A sample enumeration will not provide such list frames. It cannot provide estimates sufficiently precise for small areas.

**Census frame:** The main means of identification of statistical units in an agricultural census is a set of lists of villages in rural areas and blocks in urban areas. But in Iran a list of enumeration districts or *hozeh*, as they are called in farsi, is usually used for the population census. This includes a

list of villages with a map for some divisions of rural areas, and aerial photographs and maps for urban areas. In Iran, rural populations are usually found in tightly knit villages, so that obtaining good information free of omissions or duplications is not difficult.

**Holding list:** The list of all holdings is prepared during enumerating operations. Households which are enumerated are identified by visiting their place of abode and their holdings. Holdings operated by juridical persons are enumerated by visiting the places.

**Data collection method:** Complete enumeration of all holdings is carried out based on direct face-to-face interviews. Each numerator is assigned an enumeration district defined in order to permit an average of 18 interviews in each day, with a total per enumerator of 540 interviews in a 30-day period.

Three different types of questionnaires are adopted for the purpose of censuses: 1) a listing form, 2) a holding questionnaire and 3) a village questionnaire. Household members or agricultural holders and local well-informed persons are interviewed to complete the questionnaires.

**Census items:** In general, the items of the census of agriculture in Iran are as follows:

**a. General characteristics of holder:**

- Name of holder
- Address
- Legal status of holder
- Private
- An individual or a household
- Two or more individuals of different households
- Government/Corporation/ Cooperative

**b. Land and water**

**Land tenure**

- Owned/Owner-like possession
- Rented for an agreed amount of money and/or produce
- Rented for a share of produce

**Land use**

- Cultivated land
- Crop land
- Arable land
- Land under annual crops
- Land under temporary meadows
- Land under perennial crops
- Land under cultivated woodland

**Irrigation and drainage**

Area irrigated by land use and type of crops

**c. Crops**

The data on crops include production and area under all temporary crops and number of trees for permanent crops, excluding tea and grapes. For tea and grapes, area cultivated and production are collected. In the 1988 census of agriculture, the minimum data requested on fertilizers and improved seed referred only to whether or not they were used on the holding for any crop.

**Annual crops**

- Name of crops grown
- Amount of production by type of crop

**Perennial crops**

- Name of crops grown
- Number of trees
- Number of trees of productive age in scattered and compact plantations
- Number of trees of nonproductive age in scattered and compact plantations
- Amount of production by crop

**Fertilizers**

- Whether inorganic fertilizer is applied
- Whether organic manure or other fertilizers are applied

**Seeds**

- Whether high-yield variety seeds are used during the year
- Crops with high-yielding varieties of seeds
- Crops with traditional varieties of seeds

For all of the above items, the time reference is the Iranian calendar year. But for the number of trees the time is the enumeration day.

**d. Animal number by type (enumeration day)**

- Sheep
- Goats
- Cattle
- Buffaloes
- Horses
- Camels
- Mules and hinnies
- Asses

**e. Poultry in traditional culture (enumeration day)**

- Chickens
- Ducks, geese or turkeys

**f. Other domesticated animals**

- Beehive and bee colonies
- Sericulture

**g. Machinery and equipment (calendar year)**

- Whether or not used on holding by type
- Owned solely by holder
- Owned by others

**h. Aquaculture (enumeration day)**

- Area of pool (for culture of warmwater fish, carps)
- Area of canal (for culture of coldwater fish)

### **3.3 Definitions, instructions and training**

Statistical experience in Iran has shown that it is essential to provide definitions and instructive manuals and extensive training for census enumerators to standardize procedures and have a common understanding of the tasks to be performed, and to provide a reference guide during field operations. The personnel assigned to census operations are provided with a booklet entitled *Instructions for census enumerators*, which describes the enumerators' duties and includes definitions regarding survey units, the field of observation and each item of the questionnaire.

### **3.4 Tabulation system**

For the tabulation of data collected, in all censuses in Iran, cross tabulation is used according to the standard features. The data collected in the agricultural censuses are summarized to meaningful conditions.

Data are often detailed in the simple form of tabulations. Generally, the tables construct by classes of two or more characteristics in the form of cross tabulations. Each table clearly indicates 1) title of table, 2) unit of measurement and 3) classification by characteristics. The cross tabulation is made in numerous combinations of items at different geographical levels such as province, *shahrestan* and village. Some of these are as follows:

- A – Number of holdings by legal status
- B – Total area of agricultural land
- C – Number of livestock
- D – Quantity of production by type of crops
- E – Area cultivated by type of crops
- F – Land use and tenure
- G – Machinery use

### 3.5 Classifications

The classifications to be used in tabulating the results of the censuses are, as far as possible, similar to the classification suggested by FAO in WCA programmes. This is necessary to provide international comparability. In Iran, for the more detailed classes, the FAO-suggested classes are regrouped.

1. Classification of total area of holding. This classification covers all holdings:
  - < 01 ha
  - 0.1 - < 0.2 ha
  - 0.2 - < 0.5 ha
  - 0.5 - < 1 ha
  - 1 - < 2 ha
  - 2 - < 3 ha
  - 3 - < 4 ha
  - 4 - < 5 ha
  - 5 - < 7.5 ha
  - 10 - < 15 ha
  - 15 - < 25 ha
  - 25 - < 35 ha
  - 35 - < 50 ha
  - 50 - < 100 ha
  - 100 - < 200 ha
  - 200 ha and over

The above classification is standardized for different statistical publications in Iran. All information is provided by this unique classification. For livestock information, the respective classifications are as follows:

<b>Number of cattle</b>		<b>Number of sheep</b>	
<hr/>		<hr/>	
Covers only cattle farms		Covers only sheep farms	
1	head	1 – 2	head
2	head	3 – 4	head
3	head	5 – 9	head
4	head	10 – 19	head
5	head	20 – 29	head
6 – 7	head	30 – 39	head
8 – 9	head	40 – 49	head
10 – 14	head	50 – 59	head

<b>Number of cattle</b>		<b>Number of sheep</b>	
15 – 19	head	60 – 74	head
20 – 29	head	75 – 99	head
30 – 39	head	100 – 149	head
40 – 49	head	150 – 199	head
50 – 59	head	200 – 399	head
60 – 74	head	400 – 499	head
75 – 99	head	500 head and over	
100 – 199	head		
200 – 499	head		
500 head and over			

For the number of goats, there is the same classification as for sheep. For other domesticated animals such as beehives, no classification is used.

### **3.6 Dissemination**

The system of data dissemination for the censuses of agriculture provides appropriate publications. The type and levels of data analysis that will be made available to users are described in a series of publications entitled *Detailed results of the general census of agriculture* and more specific data are available on diskettes according to standards which will allow users to undertake further research.

### **3.7 Post-enumeration survey**

Just after the fieldwork of each census, a post-enumeration survey is usually carried out as quality check. This sample-enumeration survey is conducted to detect the types of nonsampling errors occurring, and the magnitude of such errors.

### **3.8 Main problems and constraints**

- Lack of a prelist of farms: the first step in a census is to provide or adopt a statistical framework. The lack of such framework makes it necessary to prepare the list of holdings during the field operation. This is a very hard and tiring task, open to omissions in urban areas. Specialists believe that the preparation of the prelist of farms could be entrusted to the executive bodies, meaning that using administrative records can be appropriate to solve the problem.
- Because of limitations of budget and personnel, the census cannot respond to all requirements.
- Lack of sufficient cooperation from respondents.

## **C. CROP PRODUCTION COST SURVEY**

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### **1. Introduction**

The crops production cost survey aims to estimate the average production cost of main crops per hectare, for seeding, protection and harvesting periods. It also aims to estimate the cost of one kilogram of every crop throughout the country and for each province.

The secondary objectives of the project are the estimation of the average production cost of different agricultural activities either mechanized or non-mechanized and the estimation of consumed inputs.

### **2. Current Organizational Structure for the Surveys**

The current organizational structure for production cost surveys is similar to the current surveys of perennial crops, as presented earlier, so there is no need to explain it here.

### **3. Survey Method**

Since the method of survey applied for the cost of production survey for crops is similar to current surveys of temporary crops, it is not necessary to explain more about it here.

Considering that the cost of production survey for crops is carried out simultaneously with current surveys of temporary crops throughout the country (provinces), the same sample villages are used. The statistical population of the project for each of the considered crops is all the holdings of rural areas with an area greater than 500 m<sup>2</sup>.

### **4. Survey Items**

In this survey, there are two questionnaires, one questionnaire designed for wheat, barley and other crops, and the other for paddy rice. In wheat, barley and other crops, there are 119 survey items and in the rice questionnaire 127 survey items.

The survey items collected by the holding questionnaire for wheat, barley and other crops are listed here.

1. Area under cultivation
2. Crop production
3. Land rent

**Land preparation phase**

4. Water rate
5. No. of irrigation times
6. Pressurized irrigation cost (sprinkler, trickle)
7. Labour/day for non-mechanized irrigation
8. Labour cost for non-mechanized irrigation
9. No. of mechanized tillage
10. Mechanized tillage cost
11. No. of non-mechanized tillage
12. Labour/day for non-mechanized tillage
13. Labour cost for non-mechanized tillage
14. Animal cost for non-mechanized tillage
15. No. of mechanized discs
16. Mechanized disc cost
17. No. of non-mechanized discs
18. Labour/day for non-mechanized discs
19. Labour cost for non-mechanized discs
20. Animal cost for non-mechanized discs
21. Mechanized leveling cost
22. Labour/day for non-mechanized leveling
23. Labour cost for non-mechanized leveling
24. Animal cost for non-mechanized leveling
25. Mechanized border striping, plotting, canalization cost
26. Labour/day for non-mechanized border striping, plotting, canalization
27. Labour cost for non-mechanized border strip, plotting, canalization
28. Animal cost for non-mechanized border strip, plotting, canalization
29. Other cost of mechanized operations in land preparation phase
30. Other cost of non-mechanized operations in land preparation phase

**Seeding phase**

31. Amount of manure (kg)
32. Cost of manure
33. Cost of transport of manure to the field
34. Mechanized manuring cost
35. Labour/day for non-mechanized manuring
36. Labour cost for non-mechanized manuring
37. Amount of phosphate (kg)
38. Cost of phosphate
39. Amount of nitrate (kg)
40. Cost of nitrate
41. Amount of potash (kg)

42. Cost of potash
43. Amount of other fertilizers (kg)
44. Other cost of fertilizers
45. Cost of transport of fertilizer to the field
46. Mechanized fertilizing cost
47. Labour/day for non-mechanized fertilizing
48. Labour cost for non-mechanized fertilizing
49. Amount of seeds (kg)
50. Cost of seeds
51. Seed sifting (cleaning)
52. Labour cost for seed treatment
53. Cost of transport of seed to the field
54. Labour/day for nursery preparation
55. Labour cost for nursery preparation
56. Cost of transplant and transport to the field.
57. Mechanized sowing , transplanting
58. Labour/day for non-mechanized sowing, transplanting
59. Labour cost for non-mechanized sowing, transplanting
60. Cost of mechanized operations in seeding phase
61. Other cost of non-mechanized operations in seeding phase

**Protection phase**

62. Water rate
63. No. of irrigation times
64. Cost of pressurized irrigation
65. Labour/day for non-mechanized irrigation
66. Labour cost for non-mechanized irrigation
67. Amount of nitrate (kg)
68. Cost of nitrate
69. Amount of other nitrate fertilizers (kg)
70. Other cost of nitrate fertilizers
71. Cost of transportation of nitrate to the field
72. Mechanized fertilizing cost
73. Labour/day for non-mechanized fertilizing
74. Labour cost for non-mechanized fertilizing
75. Mechanized crust breaking and weeding cost
76. Labour/day for non-mechanized crust breaking and weeding
77. Labour cost for non-mechanized crust breaking and weeding
78. Amount of herbicide (kg)
79. Cost of herbicide
80. Amount of insecticide (kg)
81. Cost of insecticide
82. Amount of fungicide (kg)
83. Cost of fungicide
84. Amount of other poisons (kg)
85. Other cost of poisons
86. No. of mechanized spraying
87. Mechanized spraying cost
88. No. of non-mechanized spraying

89. Labour/day for non-mechanized spraying
90. Labour cost for non-mechanized spraying
91. Biological control cost
92. No. of thinning
93. Labour/day for thinning
94. Cost of thinning
95. Other cost of mechanized operations in protection phase
96. Other cost of non-mechanized operations in protection phase

**Harvest phase**

97. Cost of harvest by combine
98. Cost of harvest by mower
99. Cost of harvest by other harvesters
100. Labour/day for non-mechanized harvest
101. Labour cost for non-mechanized harvest
102. Mechanized cost of transport to stack
103. Labour/day for non-mechanized transport to stack
104. Labour cost for non-mechanized transport to stack
105. Mechanized threshing cost
106. Labour/day for non-mechanized threshing
107. Labour cost for non-mechanized threshing
108. Cost of crop exposing
109. No. of sacks or boxes
110. Cost of sacks or boxes
111. Labour/day for sacking and loading
112. Labour cost for sacking and loading
113. Cost of transporting of crop to stack
114. Cost of transporting of crop to market
115. Cost of other mechanized operations in harvest phase
116. Other cost of non-mechanized operations in harvest phase
117. Value of main crop
118. Value of by product
119. Value of premium and services

The survey items collected by the rice holding questionnaires are:

1. Area under cultivation
2. Amount of paddy (kg)
3. Land rent

**Land preparation phase**

4. No. of mechanized tillage
5. Mechanized tillage cost
6. No. of non-mechanized tillage
7. Labour/day for non-mechanized tillage
8. Labour cost for non-mechanized tillage
9. Animal cost for non-mechanized tillage
10. Labour/day for non-mechanized plotting and border stripping
11. Labour cost for non-mechanized plotting and border stripping
12. Mechanized leveling cost

13. Labour/day for non-mechanized leveling
14. Labour cost of for non-mechanized leveling
15. Mechanized canalization and silt clearance cost
16. Labour/day for non-mechanized canalization and silt clearance
17. Labour cost for non-mechanized canalization and silt clearance
18. Other cost of mechanized in land preparation phase
19. Other cost of non-mechanized in land preparation phase

**Seeding phase**

20. Amount of seed consumed for nursery preparation (kg)
21. Cost of seed consumed for nursery preparation
22. Cost of seed treatment and seed soaking for nursery preparation
23. Cost of tillage and leveling for nursery preparation
24. Cost of border strip and canalization for nursery preparation
25. Cost of sowing for nursery preparation
26. Cost of plastic consumed for nursery preparation
27. Cost of wood consumed for nursery preparation
28. Cost of covering of nursery
29. Amount of consumed poison in spraying the nursery
30. Cost of poison in spraing the nursery
31. Labour/day for spraying the nursery
32. Labour cost for spraying the nursery
33. Transplant cost and transport the transplant to the paddy field
34. Labour/day for transplant and transport to the paddy field ( non-mechanized)
35. Labour cost for transplanting and transporting to the paddy field
36. Mechanized transplanting cost
37. Labour/day for transplanting (non-mechanized)
38. Labour cost for transplanting (non-mechanized)
39. Other cost of mechanized operations in seeding phase
40. Other cost of non-mechanized operations in seeding phase

**Protection phase**

41. Amount of manure(kg)
42. Manure cost
43. Cost of transportation of manure to the field
44. Mechanized manure cost
45. Labour/day for non-mechanized manure
46. Labour cost for non-mechanized manure
47. Amount of urea (kg)
48. Cost of urea
49. Amount of phosphate (kg)
50. Cost of phosphate
51. Amount of potash (kg)
52. Coof potash
53. Amount of other fertilizers (kg)
54. Other cost of fertilizers
55. Cost of transport of fertilizers to the field
56. Mechanized fertilizing cost
57. Labour/day for non-mechanized fertilizing

58. Labour cost for non-mechanized fertilizing
  59. No. of biological controls
  60. No. of tractor in biological control
  61. Cost of tractor
  62. Labour/day for biological control
  63. Amount of herbicide (kg)
  64. Cost of herbicide
  65. No. of mechanized spraying for herbicide
  66. Mechanized spraying cost for herbicide
  67. No. of non-mechanized spraying for herbicide
  68. Labour/day for non-mechanized spraying for herbicide
  69. Amount of insecticide (kg)
  70. Cost of insecticide
  71. No. of mechanized spraying for insecticide
  72. Mechanized spraying cost for insecticide
  73. No. of non-mechanized spraying for insecticide
  74. Labour/day for non-mechanized spraying for insecticide
  75. Labour cost for non-mechanized spraying for insecticide
  76. Amount of fungicide (kg)
  77. Cost of fungicide
  78. No. of mechanized spraying for fungicide
  79. Mechanized spraying cost for fungicide
  80. Labour/day for non-mechanized spraying for fungicide
  81. Labour cost for non-mechanized spraying for fungicide
  82. Water rate
  83. Irrigator wage
  84. No. of irrigation times
  85. Pressurized irrigation cost (sprinkler, trickle)
  86. Labour/day for non-mechanized irrigation
  87. Labour cost for non-mechanized irrigation
  88. No. of mechanized weeding
  89. Mechanized weeding cost
  90. No. of non-mechanized weeding
  91. Labour/day for non-mechanized weeding
  92. Labour cost for non-mechanized weeding
  93. Other cost of mechanized operations in protection phase
  94. Other cost of non-mechanized operations in protection phase
- Harvest phase**
95. Cost of harvest by combine
  96. Cost of harvest by mower
  97. Cost of harvest by other harvesters
  98. Labour/day for non-mechanized harvest
  99. Labour cost for non-mechanized harvest
  100. Mechanized cost of transport of paddy to stack
  101. Labour/day for non-mechanized transport of paddy to stack
  102. Labour cost for non-mechanized transport of paddy to stack
  103. Animal cost for transportation of paddy to stack
  104. Mechanized threshing cost

- 105. Labour/day for non-mechanized threshing
- 106. Labour cost for non-mechanized threshing
- 107. No. of sacks used
- 108. Cost of sacks
- 109. Labour/day for sacking and loading
- 110. Labour cost for sacking and loading
- 111. Cost of transportation of paddy to market
- 112. Other cost of mechanized operations in harvest phase
- 113. Other cost of non-mechanized operations in harvest phase
- 114. Value of main crop
- 115. Value of by product
- 116. Value of premium and services

**Paddy conversion to rice phase**

- 117. Amount of paddy transported to the rice factory (kg)
- 118. Transportation cost of paddy from stack to the rice factory
- 119. Labour/day for loading of paddy from stack and unloading in the rice factory
- 120. Labour cost for loading of paddy from stack and unloading in the rice factory
- 121. Cost of drying rice in the rice factory
- 122. Mechanized threshing cost of rice
- 123. Amount of rice obtained
- 124. Transportation cost of rice from factory to stack or market
- 125. Labour/day for loading of rice from rice factory and unloading in stack or market
- 126. Labour cost for loading of rice from factory and unloading in stack or market
- 127. Other cost of paddy conversion to rice.

## **5. Publications**

The results of the project are published in three volumes.

Volume 1: The results of the crops in the country

Volume 2: The results of the provinces, separated by crop

Volume 3: The results of the crops in every province

The results of the project are also presented to users in the form of a databank. In this databank, the comparison of survey items is possible for the country and for each province in different crop calendars and also the comparison of a specific crop information through the country. All of these databanks (16 years worth of the cost of production survey for crops) are available for users.

## **6. Current and Future Plans to Improve the Survey Including the Use of the Multiple-Frame Method**

In this survey, items are estimated at the provincial level. One of the most important uses of the project is to specially guarantee prices of crops.

In the production cost survey, the villages enumerated in 1993 constitute the basis of sampling, but using the area frame or a combination of different frames (multiple frames) is under consideration.

## **7. Problems and Constraints**

- Lack of accurate and up-to-date frames
- Using estimated (specialized) statistics based on specialized views such as permanent crop data, which is reported by administrative units
- Non-up-to-date agricultural statistics/information
- Lack of necessary motivation for statistical technical personnel
- Shortage of specialized and experienced personnel in the field of agricultural statistics
- Shortage of required budget and finance to execute statistical surveys
- Lack of coordination between units producing agricultural statistics and other units
- Lack of appropriate equipment and facilities for using the area frame sampling such as optimum aerial photographs and satellite images

## **8. Proposed Solutions**

- Updating statistical frames and using multiple frames.
- Providing statistical needs and substituting the statistics, which are based on scientific methods, emphasizing updating, accuracy and availability, instead of estimated specialized statistics.
- Establishing registered statistics in executive organizations.
- Applying direct measuring methods for some of the main and strategic crops (i.e. direct measurement of area of paddy, potato, onion).
- Preparing statistical information and publishing the results at the proper time.
- Investing in the training of statistical experts.
- Motivating for attraction and maintenance of statistical personnel in statistical sectors and eliminating unjust treatment between statistical experts and other personnel.

## **D. METHODOLOGICAL REVIEW OF STATISTICAL ACTIVITIES FOR CROPS**

**Mr Ali Yousefiyan Arani**  
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### **1. Introduction**

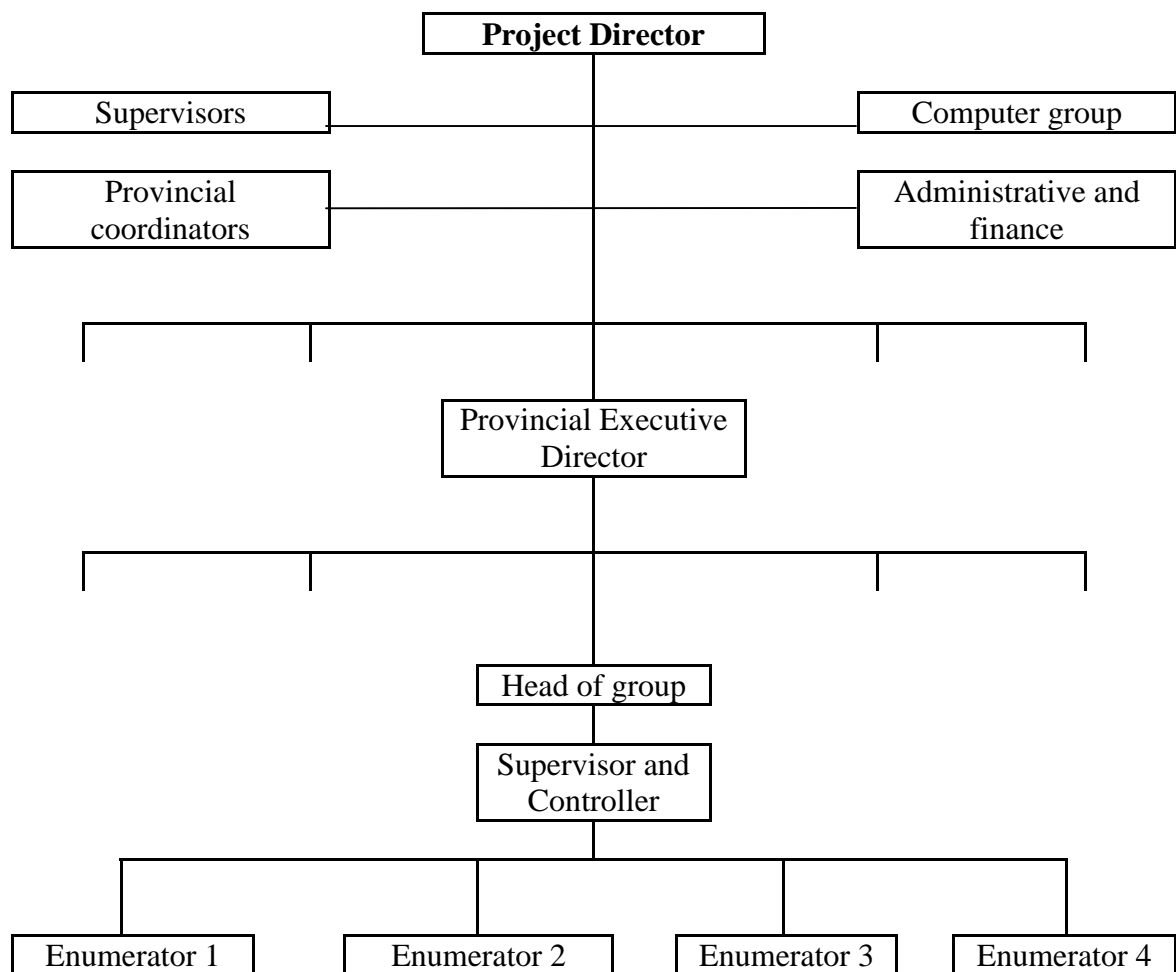
Statistics and information have a very important role in planning, decision-making, research and development. Preparing and providing timely and accurate statistics is the main mission of statistical organizations. The Agricultural Statistics and Information Department (ASID) of the Ministry of Agriculture (MOA) of Iran is the main organization responsible for preparing and providing agricultural statistics and information. At present, ASID implements four sample surveys for this mission every year.

### **2. Organizational Structure of Statistical Activities at MOA**

The country has been divided into 28 provinces. In each province there is an agricultural organization to support, maintain and give service to the farmers. In each province there are some townships and in each township there is an agricultural office. The township has been divided into *dehestans*. In each *dehestan* there is a centre of agricultural services responsible for supporting, guiding and providing services to farmers and holders.

There is a statistical and computer office in every agricultural organization in each province responsible for statistical activities such as sample surveys, data collection, data entry and preparation of statistical reports. The execution chart of sampling surveys in the former Ministry of Agriculture was as shown overleaf.

The following are the actions taken for a design to be implemented. First, the project director with the assistance of the computer group and supervisors selects samples of villages for all townships. Then the list of samples, questionnaire forms, and instructions are prepared in ASID and send to the provincial executive director. In the province, the executive director should organize the training course for executive and field staff. The field and executive personnel carry out the data collection and fill in the questionnaires. The data are entered in the computer, and the completed questionnaires and computer diskettes of statistical data are sent to ASID for processing and dissemination.



### 3. Survey Methodology

At present there are four sample surveys for estimation of statistical data items for annual crops: the wheat and barley sample survey; the paddy rice sample survey; the sample survey for other annual crops; and the sample survey for production cost of all main annual crops. The latter will be discussed in a separate paper.

In these surveys, the sampling method is based on the two-stage stratification. In each township all villages are sorted according to area size and stratified, and optimum allocation determines the sample size in each stratum. The systematic sample selection is done for each stratum and some villages are selected as first-stage samples. In each sample village, all holdings are listed by enumerators and big holdings are selected as second-stage samples.

The approximate sample sizes of these surveys for annual crops are as follows:

- The wheat and barley sample survey : 4 500 selected villages and 22 000 holdings in sampled villages.
- The paddy rice survey: 900 selected villages and 5 000 holdings in sampled villages.

- The sample survey for other annual crops: 4 700 selected villages and 25 000 holdings in sampled villages.

The sample surveys have the following characteristics:

- The survey frame is based on the latest agricultural census.
- The samples are selected each year.
- Within each township, the first-stage sampling units are the villages.
- The sample villages are selected with probability proportional to area size (total area under cultivation).
- The second-stage sampling units are the holdings.
- The agricultural data items are estimated at township level.
- A complete enumeration is done for big and special units.

Data collection activities:

Training courses for enumerators are conducted at provincial office, before each survey round to collect data from farmers. Then enumerators complete a questionnaire for each agricultural sample holder. The supervisors monitor and evaluate data-gathering activities. The enumerators collect the data for each selected holding through direct interviews with the holders.

#### **4. Data Items**

Data items in these agricultural surveys for temporary crops are:

- Cultivated areas
- Harvested areas
- Destroyed areas
- Production
- Inputs (seed, fertilizer, pesticides, herbicides)

#### **5. Data Processing**

The completed questionnaires are reviewed and edited by supervisors, then they are sent to the provincial statistics office for preparation for data entry. Each completed and edited questionnaire is coded and entered into the computer and then verified, using a special computer program developed by the ASID staff. The statistical data of every province is sent as a diskette to ASID. At ASID the statistical data are processed using computer software developed for the purpose.

The estimation of data items is done for each township. The results and survey estimates are published and disseminated in the form of statistical yearbooks and databanks. Every user can get access to the data as hard copy or via the computer network.

## **6. Survey Execution Time**

The execution time of sampling surveys is after harvesting time over a period of two months. These periods are as follows:

- for wheat and barley: June/July
- for rice: July/September
- for other crops: October/December

It should be mentioned that due to a lack of resources the sample survey for perennial crops has not been implemented so far. For those crops, a subjective annual survey is undertaken and data for the crops are prepared from administrative reports by provincial offices.

## **7. Plan to Improve the Surveys**

- The multiple or area frame sampling methods are the only types of sample surveys that can provide reliable data. In these methods, appropriate use of frame will improve the accuracy of estimation. Application of the multiple frame survey is proposed. It combines a probability sample of land area called segment selected from an area frame with a complementary list of special agricultural holdings. Construction of the area frame needs satellite images, topographic maps and aerial photographs.
- Review and improve the statistical structure of the agricultural sector.
- Train statistical personnel.

## **8. Problems, Issues and Constraints**

- Absence of strategic planning for preparing agricultural statistics needs.
- Lack of specialists and poor use of their skills.
- Limited transportation facilities for collecting data.
- Holders' imprecise response in data collection.
- Inadequate financial resources for the execution of statistical activities.

## **9. Proposed Solutions**

Establishment of a modern network and supporting information technology infrastructure that would enable to gather, analyse and prepare high-quality, accurate and timely statistics and information is one solution. Data collection is an important, difficult and time-consuming part of statistical activities and the success of the entire operation depends on it. Direct measurement can help to provide accurate data. Using modern technology such as remote sensing, electronic networking and new sampling methods are the other solution to improve agricultural statistics.

## **E. COMPILATION AND USE OF THE NATIONAL ACCOUNTS AND OF THE GROSS DOMESTIC PRODUCT**

**Mrs Mehrnosh Mojtahedi**  
Statistical Centre of Iran

The preparation of the National Accounts was carried out by calculating the value added in the various economic sectors. This was done by the Statistical Centre of Iran (SCI) from 1973 to 1982. The calculation of the gross domestic product (GDP) of Iran in the expenditure account approach started in 1982. The production account approach at the current price was made for the period from 1991 to 1999. Now, the SCI plans to calculate the country's GDP at constant price in both the production and expenditure approaches for the mentioned period.

Concepts, definitions, classification and the calculation methodologies of the 1993 Satellite National Account (SNA) recommendations have been used to calculate GDP. All economic activities classified according to 'ISIC Rev. 3. Agriculture, hunting, forestry and fishing' are included in this classification. Agriculture, hunting and forestry form one group, fishing forms the other.

This paper presents the activities of the groups in the following details:

- Farming and horticulture
- Livestock and poultry raising
- Agricultural services and animal husbandry
- Hunting
- Forestry
- Fishing

### **1. Farming and Horticulture**

#### **1.1. The activity coverage**

The following covers the activities relating to growing annual and perennial crops, vegetables, as well as horticulture:

- Growing of cereals and the other crops not elsewhere classified.
- Growing of vegetables, horticultural specialities and nursery products.
- Growing of fruits, nuts, beverage and spice crops.
- Growing of crops combined with farming of animals (mixed farming).

## **1.2 The economic agents of the activity**

The economic agents of the activity are the households and establishments engaged in farming and horticulture.

## **1.3 Output value, intermediate consumption value and value added**

Output value of farming and horticultural activity includes the value of the crops harvested and value of either plant or product for its growth during the related period. Also included are:

- Value of products sold during the period
- Self-consumption
- Capital formation in the orchards and nurseries
- Value of products provided to the workers as consumption for their services
- Value of the barter payments
- Value of changes in the inventory, at the beginning and at the end of the period
- Formation of the fixed capital in own-account

It should be noted that the output value in the producer price is based on SNA recommendations.

Intermediate consumption of the farming and horticulture activity includes: expenditures on seeds, fertilizers, poisons, transportation, bulbs, agricultural services, rents of buildings, etc. The value of the intermediate consumption is calculated at the purchaser price.

The value added is the difference between the value of the intermediate consumption and the output value.

## **1.4 Statistical sources and methods for data collection**

The statistical sources for farming and horticulture are the agricultural surveys of the Ministry of Jihad-e-Agriculture (MOJA). The frame is obtained from the agricultural censuses. The various quantities of annual and perennial crops and the area under cultivation of these crops are obtained by carrying out the agricultural surveys. In addition, the prices of the annual and perennial crops are collected through the survey of the sale price of the crops and the agricultural service costs, in which the crop prices are the producer prices. The production value of the farming and horticultural products is calculated based on the results of these surveys.

Since the above-mentioned surveys cannot cover the value of production of flowers, ornamental plants and mushrooms, the surveys on flowers and ornamental plants and the administrative records of MOJA are used for this purpose. The agricultural survey for the national accounts is used to obtain the intermediate consumption of the said activities. For calculation of the other output components, studies conducted on an ad-hoc basis are employed.

## **1.5 Special issues**

Simple activities such as husking the paddy rice and almond and drying them, processing of crops like tea in the farm are regarded as being parts of the farming and horticultural production.

The waste of the agricultural crops during production is not considered as a part of production, but waste after harvesting is included in the production value on the one hand and in the intermediate consumption on the other. The accounting period used for the national accounts is the calendar year. However, agricultural statistics are mostly compiled for the farming year, which is different from the calendar year, whereas the farming year is equated with the calendar year in current surveys.

Agroindustry companies engaged in farming and horticulture and in industrial activities usually have central offices, and the expenditure of these offices will be divided between the two activities in relation to the production value of farming and horticulture and the industry. In dividing farming and horticultural activity and industrial activity, there may be the problem of pricing the agricultural crops of these companies. To have a proper pricing, the market price of the crops should be applied.

## **2. Livestock and Poultry Raising**

### **2.1. The activity coverage**

Based on ISIC Rev. 3, the division of the livestock and poultry comprises the following activities: 0121. Farming of cattle, sheep, goats, horses, asses, mules and hinnies, dairy farming; and other animal farming (poultry, honey bee, silkworm cocoon, etc).

## **2.2. The economic entities**

The economic entities of the activity are composed of households and establishments engaged in livestock and poultry raising.

## **2.3 Output value, intermediate consumption and value added**

The output value of this activity is equal to the sum of the value of the crops produced and the value arising from the changes in the weight and the inventory of the livestock including:

- The value of products sold during the period containing the value of the livestock and poultry sold, and the livestock products sold
- Self-consumption
- The value of changes in the livestock inventory at the beginning and at the end of the period
- The value of the barter payments
- Constant capital formation in own-account
- The value of the dairy products in the traditional establishments

The intermediate consumption of livestock and poultry raising includes the expenditures related to the livestock and poultry feed varieties, livestock and poultry consumed, varieties of drugs and vaccines, disinfectants, veterinary and animal husbandry, etc.

The value added is the difference between the value of the intermediate consumption and the output value.

## **2.4 Statistical source and data collection methods**

The statistical surveys of the traditional animal husbandry, poultry, honey bee, silkworm cocoon, survey on the breeder, broiler and layer chicken farms, hatcheries and survey on the modern cattle farms, as well as the results of the surveys of sale prices of the products and agricultural service costs are the statistical sources that are calculated from the production value of the livestock and poultry raising activity.

In cases where there is no statistical survey, the related indexes are calculated from the surveys on an ad-hoc basis. Also, the output value is calculated at producer price level. The above-mentioned surveys are used to calculate the value of the intermediate consumption at producer price level.

## **2.5 Special issues**

The important point in livestock raising is inclusion of the animal's growth in the production value of this activity. Thus whenever the production process may last over one accounting period, the value of work during the manufacturing process should be calculated as the output.

SNA has made a distinction between raising the livestock for the purpose of slaughtering on the one hand and raising them for breeding, dairy products, and carrying loads on the other hand. Livestock raising is considered as a part of the production and capital formation of the livestock in the related section.

Since the pastures in Iran are nationalized, payments by people raising livestock on account of rent of pastures are not included in the intermediate consumption.

When the government grants aids in kind such as drugs, vaccines, or veterinary services to the veterinary units, the value of these goods and services is not included in the intermediate consumption.

The livestock and industrial companies engaged in livestock and poultry raising and in industrial activities such as poultry and livestock slaughtering and production of dairy products, have the expenditures of their central offices divided between the two activities in relation to the production value of livestock and poultry raising and of the industry. In dividing the two activities in these establishments some problems may occur in pricing the products. The market prices of the products are to be used for the proper pricing.

## **3. Agricultural and Animal Husbandry Services**

### **3.1 The activity coverage**

According to ISIC Rev. 3, all activities related to farming and horticultural affairs including cultivation, protection and harvesting as well as various services for livestock raising which can be conducted on a contractual basis are classified in class 0130.

### **3.2 The economic entities**

All establishments providing agricultural and animal husbandry services, operating as natural persons or legal entities, are regarded as the economic units of the activity.

### **3.3 Output value, intermediate consumption value and value added**

The output value of this activity is equal to the amount received on account of providing agricultural and animal husbandry services, including:

- The amount received from service activities on a contractual basis or compensation received during the cultivation, protection and harvesting of farming and horticultural products.
- The amount received from service activities on a contractual basis or compensation received for the livestock and poultry-raising activities.
- The main intermediate consumption of this activity is varieties of fuel, nondurable tools and equipment, materials consumed, etc.

The value added is the difference between the intermediate consumption value and the output value.

### **3.4 Statistical source and data collection methods**

Data relating to the output of the agricultural and animal husbandry services are obtained from the information pertaining to the use of such services. Therefore, the sum of the intermediate consumption, in the areas of farming, horticulture, poultry and livestock raising, made on account of the agricultural and animal husbandry services, is the output of this activity.

In order to calculate the intermediate consumption of the agricultural and animal husbandry services, a sample survey in a limited extent is conducted so that the proportion of the intermediate consumption to the output of the activity can be obtained. Then the total intermediate consumption of the activity can be calculated using the proportion thus obtained.

### **3.5 Special issues**

These establishments are mostly run by the informal sector and because there is no clear frame for them, the estimation on production is made with the use of the consumption method. It is necessary to mention that the formal sector establishments engaged in this activity have only a small share in the estimation of the production value.

## **4. Hunting**

Hunting, trapping and game propagation for earning income are classified in class 015 of ISIC Rev. 3.

### **4.1 The economic entities**

All hunters, trappers and establishments raising game for the purpose of earning income are regarded as the economic entities of this activity.

### **4.2 Output value, intermediate consumption value and value added**

The output value includes the value of the hunted animals sold, and the value of the game products composed of meat, skin and horn sold; the value of game products consumed by the household hunter, and of game products provided to the other establishments or workers, free of charge, as barter or compensation for their services.

The intermediate consumption of this activity covers preparation of the groundwater and cartridge, cost of the game transportation and trivial repair of gun, etc.

The value added is the difference between the value of the intermediate consumption and the output value.

### **4.3 Statistical source and data collection methods**

The data pertaining to the output of this activity are collected through the hunting permits issued by the General Department of Environment Organization, the sampling survey and the results of the household income and expenditure survey.

The intermediate consumption value is obtained to a limited extent through the sample survey.

### **4.4 Special issues**

Allocating a separate code to this activity indicates its value added in the other countries. However it has only a small share of GDP in Iran.

## **5. Forestry**

Forestry has been classified in ISIC Rev. 3, division 02, class 0200, forestry logging and related service activities.

### **5.1 The economic entities**

The General Department of Natural Resources and the head forestry, including people exploiting the forest resources, are the economic entities of the activity.

### **5.2 Output value, intermediate consumption value and value added**

The output value includes the forest products, the activity value of the forest protection, forestry and the capital formation in own-account.

The intermediate consumption includes the value of seed, sapling, shrub, etc.

The value added is the difference between the intermediate consumption value and the output value.

### **5.3 Statistical source and data collection methods**

The budget of the General Department of Natural Resources is obtained from the share of the government activities. The statistical surveys conducted on an ad-hoc basis are used to collect the data related to the private sector.

## **6. Fishing**

The activity of fishing and fish culture comprises catching fish in international, coastal and inland waters and fish and other aquatic animal culture classified in the division 05 of ISIC.

### **6.1 The economic entities**

The establishments engaged in fish culture, fish catching companies and independent fish catching by fisherboat are the economic entities of this activity.

## **6.2 Output value, intermediate consumption value and value added**

The output value comprises the value of catching the species of aquatic animals in international and domestic waters, the operation of fish hatcheries or fish farms, species of the larvae and baby fish reproduced in the fish hatcheries or fish farms.

The value added is the difference between the intermediate consumption value and the output value.

## **6.3 Statistical source and data collection methods**

The registered data and the results from the Fishery General Departments, and studies and surveys of the fish culture centres are the most appropriate sources to receive the data needed.

## **7. Recommendations**

The concepts and definitions of the FAO statistics should be matched with the 1993 SNA. The national accounts are stated in terms of money, that is, all inputs of accounts are consumption of the value of the varieties of transactions and provide a framework giving a clear picture of the economic activities in the sector, making it possible to study the performance of the sector and to compare it with the other economic sectors. For instance, it may well be that the production values versus the expenditures sustained in the production process, investment level (capital formation) versus the preparation of the related capital, and the income of the farmer households versus the expenditures are taken into consideration.



## **F. USING INFORMATION TECHNOLOGY IN PRODUCING AGRICULTURAL STATISTICS**

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### **1. Introduction**

The Agricultural Statistics and Information Department (ASID) is the core unit in the Ministry of Agriculture in which information technology is used. Provincial agricultural organizations and township agricultural managements cooperate with ASID as the executive assistants for gathering, producing and distributing information.

The five main activities of ASID can be listed as:

- Preparing and producing agricultural statistics using computer software systems developed for the main agricultural statistics projects.
- Developing agricultural databanks based on the results of annual reports on the main agricultural statistics projects.
- Preparing and producing agricultural information and statistics in the form of computer software systems of the relevant departments of the ministry of agriculture.
- Presenting agricultural information and statistics in local and international networks.
- Using remote sensing and GIS technology to provide statistical information.

### **2. Preparing and Producing Agricultural Statistics**

In the ministry of agriculture, there are main computer software systems for statistical surveys of the production cost and current agricultural statistics. Considering the complexity of statistical activities and the huge amount of information to be gathered from all over the country, computer software systems are necessary to be developed for different phases of these surveys.

Computer software systems that have been developed and are currently used by ASID are:

- Selecting sample villages
- Production cost surveys
- Current agricultural statistics surveys
- Publications such as statistical yearbooks

Below is a brief explanation about the above software systems.

### **2.1 Computer software system for selecting sample villages**

In each survey, based on available statistical algorithms, these software systems select 10 000 villages from the total number of 120 000 villages as sample villages each year. The used databank was prepared from the 1993 agricultural census. This databank was updated and corrected with the help of provincial organizations in 1999. In the next phase and during field visits, about 100 000 selected farmers are questioned and statisticians fill in the already prepared questionnaires.

### **2.2 Computer software system for production cost surveys**

For the first time in Iran in 1983, a computer software system was developed on a UNIVAC mainframe to estimate the production cost for different crop growth phases (seeding, protection and harvesting phases). This software was in use until 1990. In 1990 after it was modified, it was possible to run it on PCs. It was then installed in the PCs of provincial organizations, and necessary instructions were given to their staff to run this program. In this way, activities were decentralized and the amount of input information and other controlling activities in the centre were reduced. Therefore, the accuracy and integrity of information increased.

### **2.3 Computer software system for current agricultural statistics**

This system is executed annually in order to estimate the cultivated area, crop production and yield. The software works like the production cost software. At first, questionnaires are completed after interviewing selected farmers and then are sent to provincial organizations.

Hand-held computers have also been used to gather and enter data. If the system is executed in subprovinces, the created database in the form of computer files is copied on diskettes and sent to the provinces, and after gathering subprovince information, the results are sent to ASID by the provincial organizations. The information is considered and compared with that of previous years. It may be corrected and the final database is created. After data processing, the information is released in the form of lists, tables and graphs.

## **2.4 Computer software system for publications**

In order to publish the outputs of the above software and other systems, which are created in the DOS operating system environment, they are transferred to the other systems in the Windows environment with the help of other programs. There, with the use of the programs which are prepared using the Delphi software package, the results in the forms of charts and tables are prepared and the desired issues are readied to print. Two of the issues are the agricultural statistics yearbook and the yearly *Production cost of agricultural products*.

## **3. Creating Agricultural Databanks Using the Annual Output of Agricultural Statistics Surveys**

The output information for the mentioned systems are generated and estimated annually to form the information necessary for time series analysis. Therefore, the databanks named “production cost databank” and “annual crops databank” have been developed. The information needed for these databanks is fed from the annual output of the software systems mentioned above.

The databases of these banks are updated each year as the new information is added, and they contain information for the last 16 years. Every year ASID sends a copy of these banks to provincial agricultural organizations and other departments which ask for information.

## **4. Development of Computer Software Systems for Other Departments**

To gather some other agricultural statistics and information, a number of software systems were developed by ASID. These software systems are either given to other department or executed in ASID. These systems are:

### **4.1 Computer software system for the estimation of cultivated area for sugarbeet**

This system is executed for six major sugarbeet producer provinces. The information on the cultivation areas in each province and the information received from sugar producing companies and contractors (who cooperate with these companies) are gathered through questionnaires. The gathered questionnaires after passing different phases like coding and controlling are fed into the computer and the database is created. The output of the system is the estimated area under cultivation for sugarbeet, presented in different forms of reports.

## **4.2 Seed and plant databank**

This bank is fed with information received from the Seed and Plant Improvement Institute. The information contains product name, suitable climate, suitable soil and other specifications.

## **4.3 Meteorological databank**

This bank is fed with the information received from the synoptic, climatology and rain gauge stations of the meteorological organization. This bank is used by most of the agricultural departments. Usually copy of the bank once updated is sent to the provincial agricultural organizations and to other departments each year. The output of the bank is provided in different forms of monthly and annual reports and data comparison reports.

## **4.4 Information system of big holdings**

The aim of this system is to collect the information about these holdings and their cooperatives and shareholders. The information consists of area under cultivation, soil type, water resources, water transferring system, crops products, animal husbandry activities, handicrafts and other related information.

## **4.5 Land affairs system for land organization**

This system is developed only for land organization and is not for public use.

## **4.6 Basic goods prices databank**

The information of basic goods prices is received weekly from the Ministry of Commerce. Different yearly reports for goods prices can be derived from the bank.

## **4.7 World agricultural databank**

The information of the databank is received from FAO. The information contains area under cultivation, production, and exports and imports of each country.

#### **4.8 Perennial crops information system**

The information of this system is provided by experts in each province using estimation and based on their views and field visits. It contains information about annual perennial crop products and the total planted area. This system provides necessary outputs in the form of computer lists and tables which are published in the agricultural statistics yearbook.

#### **4.9 Data bank for the agricultural services centres**

This bank is designed to provide villages with agricultural information. This system uses the input provided by the agricultural service centres. This system is due to be expanded into an information provider networks, from the agricultural service centre level to the subprovince and province levels and finally to ASID.

### **5. Providing Agricultural Information and Statistics to Local and Global Networks**

ASID-produced statistical banks and systems are offered to the public through the local network of the ministry. Also two databanks are on the department's homepage and are available to the public through the Internet. The address of this site is [www.MOA.OR.IR](http://www.MOA.OR.IR). The main building of the ministry has a local network that is based on star topology with 100 Mb/s. This network is connected to the Internet with 256 Mb/s. The ministry plans to have its own network connected to the provincial organizations in order to increase information transfer efficiency. For the time being, the local network is connected to the remote users and agricultural organizations through 10 dial-up telephone lines. The local network is also connected to the mainframe computer through a gateway. The local network provides all the Internet services like Web, email and so on for its users.

### **6. Issues and Proposed Solutions to Improve Information Technology in the Agricultural Sector**

- Considering the limitations and difficulties existing in the communication structure of the country, as the first step, a suitable connection between provincial organizations and the centre should be sought. Establishing a private network for the ministry is one of the agricultural sector's priorities.
- Using hand-held computers in order to collect information and using the new methods and tools of information collection and distribution.
- Increasing the use of Internet in order to present information in larger dimensions and using the remote-selling system for information presentation to the public.

- Better and greater coordination in the agricultural sector and setting standards for software, hardware and applications at all the department levels.
- Equip the agricultural services centres with computer facilities and create a network at different levels of centre, provinces, subprovinces, villages and services centres, and create databases for those levels.

## **7. Remote Sensing and GIS Applications in the Field of Agriculture**

### **7.1 Introduction**

The remote sensing and GIS unit of ASID is one of the premier institutions in Iran in the field of remote sensing and GIS technologies. It was established in 1973 when Iran was known as the fourth country in the world to have a satellite ground station to receive satellite data. This unit started its activities with small projects and used visual and digital interpretation of satellite images to generate land use/land cover maps for different parts of Iran. In 1986, the GIS activities of this unit began. As a result of technology advances, the experts in this unit used digital satellite data to extract information from these data after getting enough training on various digital image-processing software through joint projects with FAO and other international organizations. The main objective of the activities of this unit is to provide timely statistical information about agriculture-related subjects including crop acreage, crop maps, land use/land cover through remote sensing and GIS and GPS technologies. In this regard, much effort has gone into obtaining the latest information for the agricultural status of different areas of the country through defining and implementing several projects. A number of these projects have been completed.

### **7.2 Projects completed**

Following is the list of projects completed by this unit. The results of the projects were documented in the form of booklets and are available on request from ASID.

- Forest area estimation and forest change study using aerial photographs and satellite data in the north.
- Land evaluation study in the Nayshabour and Sabzewar areas of Khorasan province.
- Mapping and inventory of renewable natural resources in the Jahrome, Firouzabad and Shiraz areas with a scale of 1:250 000.
- Preparation of land use/land cover maps for different provinces based on visual and digital interpretation of satellite data for

seven provinces, the Urmieh plain, Shahi island and the south Tehran area.

- Crop area estimation for wheat and barley using remote-sensing data in the Mazandaran province.
- Crop area estimation using AFS method for the Hamadan province.
- Evaluation of different classification algorithms for crop area estimation using remote-sensing data in the Markazi province.
- Perennial crops area estimation using remote sensing, GIS and GPS technologies for the Hamadan province.
- Paddy rice area estimation using remote-sensing data for Astaneh Ashrafiyeh township of the Gilan province and Amol and Babol townships of the Mazandaran province.
- Date palm area estimation using remote sensing, GIS and GPS technologies for the Khozestan and Hormozgan provinces.
- Tea plantation area estimation using remote-sensing data for Lahijan and Langeroud townships, Gilan province.
- Development of local GIS to be used by provincial organizations for the Gilan, Hamadan and Qom provinces.
- Development of crop forecasting system for the Hamadan province.
- (Joint project with ITC, Netherlands)

### **7.3 Current activities**

Followings are the current activities of the unit.

- Land use/land cover mapping for the Hourmozgan province based on visual and digital interpretation of satellite data.
- Land use/land cover mapping and database generation for Shadegan marshes and Urmieh Lake (a part of the World Bank project).
- Date palm area estimation using remote sensing, GIS and GPS technologies for the Fars and Bousher provinces.
- Development of local agricultural GIS for the Golestan province.
- Crop area estimation using the AFS method for the Khozestan province
- Updating available maps and preparation of different database layers for GIS.
- Research work on different areas of remote sensing and GIS.
- Conducting short-term remote-sensing and GIS courses for province-level staff.

## **7.4 Methodology**

For making land use/land cover maps which are used to extract statistical information, a framework was defined. This framework includes as first step the definition of a legend in which most of the interested categories appear. In the second step, based on the scale of the final maps and type of interpretation (digital or visual), satellite data are purchased and a first visit to sites is conducted to get familiar with the categories on the land. After the interpretation is done, a mid-term field check is conducted to correct any interpretation errors and then a final field check is conducted to check the accuracy of the interpretation. Statistics could be easily extracted from outputs of this work.

A common procedure is followed for extracting statistical information on the areas of different crops. This includes purchasing satellite data, preparing them for interpretation (mostly digital), initial visit to the sites, geometric correction of images, pre-classification of satellite data, design and selection of samples, collection of information about samples, final classification, final field check and classification accuracy assessment based on the error matrix and the KAPPA coefficient.

To develop a local GIS, initially, all the needs of the local users are studied. Based on this study, the necessary users' information is defined and collected. After preparing, organizing and making links between data, subsystems and applications are developed. Programming and executing applications are done and subsystems are tested and finalized. A documentation and manual is then given to users.

## **7.5 Related issues**

The issues related to map making, information extraction, and GIS activities here are mainly the lack of funding and the lack of understanding among decision-makers about these technologies. The former causes a lot of problems which prevent Iran from having a countrywide geographical information system.

Apart from the above-mentioned issues, there is much to be done for the agricultural sector in Iran through remote sensing and GIS technologies. For example, getting information on drought and statistics of its extent through these technologies will lead to better decisions in future planning.

## **G. METHODOLOGICAL REVIEW OF STATISTICAL ACTIVITIES OF LIVESTOCK, FORESTRY AND FISHERY**

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### **1. Introduction**

In Iran, livestock as a subdivision of the agricultural sector enjoys an important place whereas forestry and fishery are of minor importance. To show the importance of the above subdivisions, the contribution of these activities to GDP can be viewed as an indicator. The contribution of livestock to GDP is about 4.5 percent, whereas those of fishery and forestry are 0.31 percent and 0.29 percent respectively. The contribution of crops is 11.62 percent.

The statistical data of the subdivision of livestock are not very satisfactory, but the status of data and statistical information on fishery due to the industriousness of the Fisheries Company are more satisfactory. The fact is that the irregularity in the collection of livestock data is mainly due to the agricultural production system of Iran. Generally, the system prevailing in Iranian agricultural sector is the system of small farms.

The distinct characteristics of this system are farming on small plots of land and keeping a small number of sheep, goats and/or cattle. In livestock rearing, the traditional method prevails. About 75 to 80 million sheep and goats are reared by about 2.4 million households. These are mostly farmers with cultivated land. Raising sheep and goats by modern methods is so rare that it can be neglected. However, cattle rearing is somewhat different. Out of about 6 million cattle in the country, 600 000 are kept in modern cattle-rearing farms, of course with higher productivity than in traditional farms. For poultry, the situation again is different. Poultry and egg production is centralized in modern industrial poultry farms with a rather high rate of productivity. In this sector the traditional method is losing ground so much that it is getting out of the attention of the relevant authorities.

### **2. Organization**

The subdivisions of livestock, forestry and fishery are managed and controlled by independent organizations. The deputy minister of the Ministry of Jihad-e-Agriculture (MOJA) has the responsibility over domesticated animals and poultry farming. The Iran Fisheries Company (IFC) is responsible for fishery and the Iran Forestry and Pastures Organization (IFPO) oversees forestry matters. The last two organizations are under different deputy ministers of MOJA. They act independently in collecting statistical data. The statistics on fishery are published by the statistical department of IFC, those of forestry (mainly administrative) are

published by IFDO. Due to the widespread activities of traditional livestock, collection of data is very laborious and therefore the deputy minister on livestock is not active.

According to the law, the statistical system in Iran is decentralized. Although there is no clear indication of non-centralization in the existing statistical law, based on the fundamental measures taken during recent years for the development of statistical activities, the preparation of surveys, field operations and publication of results is speedily diverted to non-centralization. By decentralization it is meant that executive organizations and ministries prepare the statistics pertinent to the said ministries themselves. SCI acts as coordinator between various statistical organizations and also plays the role of executive body for censuses and large-scale sample surveys.

During the past decades state-run bodies did not possess the capability for preparing statistical surveys. With the development of the country's administrative system, provision of necessary laws and setting up of statistical departments in executive organizations, the potential for preparing statistics has gained ground. Thus in recent years, the duty of preparing agricultural statistics was shouldered by SCI. Since 1990, with the development of the Agricultural Statistics and Information Department (ASID) of the former Ministry of Agriculture, the annual survey of annual crops has been carried out by ASID. However, as regards the development of livestock data, SCI implements almost all statistical surveys in this respect, since the former MOJ was formed, and the development of a statistical office in that ministry was delayed. With the merger of the two ministries of agriculture and Jihad to form the Ministry of Jihad-e-Agriculture, coordination has been speeded up. It is anticipated that there will be complete coordination and harmony in the near future. At present, with the agreements already made, it has been decided that the development of some of the main statistical surveys, depending on the organizational potential, are to be performed by MOJA.

The cooperation of the Statistical Centre of Iran (SCI) in the implementation of some of the agricultural surveys will be continued until MOJA can handle all statistical surveys. Still, the implementation of the agricultural census and some of the pertinent case surveys will remain as the main duty of SCI.

### **3. Livestock**

In general, livestock in Iran is divided into two groups, traditional and industrialized. The statistical surveys on livestock with indication of items surveyed are listed below.

### **3.1 Statistical survey on industrial cattle breeding**

This survey is conducted by SCI every two or three years. The initial framework of such a survey is the past agricultural census, with complementary data obtained from other sources. This survey was conducted for the first time in 1990 by complete enumeration, then again in 1994, and is due to be conducted again in 2002. Sample surveys are conducted between the main surveys. It may be noted that the main objective of the survey is to update the statistical frame for industrial cattle farming. By conducting industrial cattle farming surveys, rather complete and useful data has been collected and provides almost all the data required by users.

#### **Survey items**

The main items collected in the survey are: number and type of cattle separately as regards age sex, breed, object of cattle farming, reproduction, production of milk, dung production, annual changes in the number of cattle including number at the beginning and at the end of the year, cattle sold and purchased, slaughtered, perished, value of cattle bought/sold existing cattle, number of workers, quantity and value of fodder consumed, various intermediary expenditures and investment costs. In general, all items are required for the national accounts. The result of the survey is available to users in the form of paper publications and via the electronic information centre and floppy disks.

### **3.2 Integrated system of industrial poultry surveys**

This system is comprised of four separate surveys, namely statistical survey of laying hen farms, statistical survey of egg-producing farms, statistical survey of broiler breeding farms and statistical survey of chicken breeding farms. They are conducted alternately in fixed periods of two to three years. The responsibility of preparing and executing the survey and of the publication of results rests with SCI.

#### **Survey items**

The main items collected in this system include the status of laying hen breeding, egg-producing hen and broiler, quantity of eggs and hatching (sperm-bearing) eggs and broiler production, quality of fertilizers produced, number of workers by sex, quantity and value of poultry feed, amount of investment, intermediate expenditures and all relevant items in general required for the national accounts.

The result of this survey in the form of a list of names and addresses together with cross tables is available to applicants in the form of paper publications and electronic information on floppy disks. Considering the negligible importance of poultry raised by traditional methods, it can be

said that the results obtained by the survey meet almost all the statistical requirements needed by planners and other users.

### **3.3 Livestock slaughtering statistical survey**

This survey is conducted with the purpose of collecting statistical data on the country's industrial slaughterhouses. SCI performs the survey, and the forms are filled on a monthly basis.

The result in the form of cross tables on a quarterly and yearly basis is available in the form of paper publications as well as electronic data. The survey covers industrial slaughterhouses both public and private, but it does not include unofficial slaughtering. The questionnaires are submitted to the slaughterhouses and the head of the slaughterhouse or the veterinary representative stationed in it fills in the relevant data on a monthly basis. The provincial offices of SCI are responsible for submitting and collecting the field questionnaires as well as controlling their contents.

#### **Survey items**

The statistical items of the survey are: number of slaughtered sheep, goats, cattle, buffaloes and camels, and number of confiscated livestock and their average weight. There is no statistical survey on unofficial slaughtering. Experts estimate that about half of all slaughters take place in the unofficial sector, i.e. in places other than registered slaughterhouses.

### **3.4 Farm-gate prices of agricultural products**

This survey is conducted on a quarterly basis to establish the farm-gate price of 27 crops. It is conducted by SCI and the results are published annually.

### **3.5 Statistical survey of honeybee colonies**

This survey was conducted once by the statistical office of the former Ministry of Jihad, and the main items under this survey include: characteristics of the place where the colonies are located, legal status of the beekeeper, number of colonies, number of workers, value of consumables, investment value, quantity of honey, wax and young bees produced, and waste output.

The survey has been conducted by the complete enumeration method. The data are collected by interviewing the beekeepers.

### **3.6 Traditional livestock survey**

As already mentioned, this sector is the most important part of the country's livestock in terms of number of livestock, value-added and employment. However, data collection in this sector is not satisfactory.

Except in 1992 when an integrated survey on traditional livestock was conducted by SCI, no statistical survey has been conducted. But in each of the previous agricultural censuses, there have been questions regarding the number of livestock, and from 1982 to 1987, when the rural agricultural survey was conducted every year by SCI, a rather detailed section was allotted to the issue of traditional livestock in the questionnaire form. No action has been taken to collect data on the traditional livestock in Iran since the 1993 agricultural census.

### **3.7 Socio-economic census of unsettled tribes**

This survey was conducted by SCI in 1987 and 1998. By gathering the social characteristics of the unsettled tribes, comprehensive information was obtained regarding their activities on livestock rearing. This information covers: number of livestock with indication of age and sex, livestock feed, extent of pasture used, milk, wool, softwood production, hand feeding, employment, etc. Though the result obtained meets the requirements of the organizations related to tribal affairs, it does not have any other application because the survey does not cover the traditional livestock completely. The survey has been conducted by traveling to the summer quarters of the tribes in accordance with rail charts indicating the location of the tribe routes and by holding interviews with the tribe households.

## **4. Forestry**

Out of about 164 million hectares of the country's land area, forests cover about 12.4 million hectares (7.6 percent). The forests of Iran are concentrated in five regions. Almost the entire forest area belongs to the government. The contribution of forestry to agricultural output is negligible and is mainly restricted to woodland exploitation.

The data on agriculture is obtained mainly by registered statistics and forestry surveys. By forestry surveys it is meant that the exploitation of forest plantations is contracted to real or legal persons. Forestry statistical surveys include the following:

#### 4.1 Statistical survey of forest exploiters

This survey was conducted only once in 1997 by SCI. The survey population was defined as all forest exploiters including the forestry and pastures organization. The results were published in a volume consisting of crossed tables; the main items under survey were: area exploited, number of trees felled, area planted with forest trees, area of forest restoration, area of seedling centre and various types of seedlings, volume of lumber, round timber, log, traverse, pitprops, tunnel supports, firewood, and charcoal production, value of medicinal, industrial gum and resin products, etc.

#### 4.2 Register reports

Every year a forestry activity survey in the form of an office report is published by the forestry and pastures organization, the main items of which include area of forestation by the public and private sectors, area of cultivated greenery, development of tree plantation, seedlings production, output of forest products, volume of round timber, lumber, traverse, log, mine supports, pit props, fire food, weight of charcoal, results of the survey on livestock excluding forest areas, survey on gathering of households scattered in forest, protection of forest and forest roads.

### 5. Fishery

Fisheries are concentrated in the three main regions of the northern waters, southern waters and inland waters.

a) **Northern waters:** They form the water area belonging to Iran in the Caspian Sea and its southern shores. The marshlands, gulfs, lagoons and rivers from the Iranian territory being natural nesting grounds for the Caspian sea, the marines are also included in this region. The northern fisheries can be classified according to fishing methods, fishing tools, exploitation systems, and fishing time. However, due to the present exploitation system, the classification in the northern region is limited to caviar bearing (sturgeon) fish, bony fish and kilka.

b) **Southern waters:** The geographical boundaries of the southern waters belonging to Iran include waters in the Persian Gulf and the Oman sea and Arvan *dood* as well as the international waters. The categorization of Persian Gulf and Oman Sea marines is different from that of the northern waters. The main criteria for classification in the south are habitat of fishes at different sea depths, biological and commercial criteria, and consumption market in the country.

c) **Inland waters:** Internal waters include artificial reproduction of fishes in fish farms, natural and semi-natural reproduction in rivers, in lakes created by dams, in irrigation water canals, in *qantas*, in agricultural pools, in dikes and in

natural lakes. Considering the biological characteristics, the marines are divided into two groups of warm-water and cool-water marines.

## **5.1 Fishery data collection in the northern waters**

In the northern waters there are three methods of fishing, 1) kilka fishing method, 2) sturgeon fishing method and 3) bony fishes fishing method (gill netting).

### **5.1.1 Kilka fishing method**

In kilka fishing, the survey is conducted by complete enumeration by the deputy office of the Iran Fishing Company (IFC). The survey unit consists of a boat. The list of boats used in kilka fishing is available from IFC. For this survey the questionnaires are submitted to the captain who fills them on daily basis. The report includes: fishing location (coded beforehand), depth of catch, water temperature, catch duration, sea and sky conditions during fishing, quantity of catch and in case of fishing stoppage, reason for stoppage, whether climatic, technical or economic.

The quantity of kilka fishing on a monthly basis is available. The statistical conclusion of kilka fishing is conducted in the fishing department of IFC, and the results are transferred to the statistical department of the company.

### **5.1.2 Data collection on the sturgeon (caviar-bearing fish) catch**

Data on fishing sturgeon are collected by the registered method. Sturgeon fishing is the monopoly of IFC, for the purpose of proper exploitation of resources and control of marine reserves. The registered data on sturgeon are collected regularly and correctly by IFC.

### **5.1.3 Data collection on bony fish**

In the past, bony fishes were caught in the northern waters by two methods: *dam gostar* or net spread (fishing in waters far away from the shore) and *pareh gostar* (fishing near the shore).

During the past years net spread fishing has been prohibited to protect the sea reserves. In the northern waters only fishing by *pareh* methods is allowed. The fishermen are members of the

*pareh* fishing cooperatives. Every year IFC collects data on bony fish catches from the *pareh* cooperatives. The items under survey include quantity of bony fish catches (Kutum, carps, salmon, bream, perch, etc), time of spreading the net, sea condition during fishing. There are 160 *pareh* fishing cooperatives. For every *pareh* there is a representative of IFC as supervisor to control the fishing and to see that the sturgeon catch is delivered by the *pareh*. The supervisor is given a number and he also collects data of bony fish catches.

#### **5.1.4 Illegal catching**

In addition to lawful fishing by obtaining a permit, there has always been some illegal fishing in the northern waters, data for which are not available. But experts estimate illegal fishing in the northern waters to be about 10 to 15 percent of total catch. No doubt this percentage is approximate and varies year to year and among the littoral provinces. The quantity of illegal fishing is estimated on an annual basis and added to the quantity caught by the fishery cooperatives.

## **5.2 Southern waters**

In the southern waters firms, cooperatives and real persons conduct fishing with the help of boats (launches) and large industrial ships. Boats go out for one day, barges for two days and large ships for up to one month. Some fishing is also done near the shore without the help of any vessel. In the southern waters this type of fishing is known as *jal sardine* and *moshta*, and is not widespread.

### **5.2.1 Catching data collection in southern waters**

The objective of this survey is to collect necessary data as regards catch and fishing in the northern part of the Persian Gulf and the Sea of Oman, including volume of catch by vessel type, tools and province during different seasons, and fish habitat. It is conducted on an annual basis.

All the fishing vessels which have obtained fishing permits and fish during the permitted period comprise the statistical survey. Each *jal* and *moshta* collection is known as a vessel.

A fishing vessel holding a permit is considered as a statistical unit. In regions where *jal* and *moshta* are used, the *jal* or *moshta* net is considered as a unit.

The list containing the names of all fishing vessels having fishing permits and forming the basis of the survey are available from IFC. The survey is conducted by the sample method. The sampling is made from classified vessels, namely: boats, launches and ships (categorized by 3 to 20 tons, 21 to 50 tons and over 51 tons). The place of survey is the unloading ports, which all belong to IFC, after the vessels have arrived.

The executive organization of the survey consists of two sections:

- Planning and coordinating committee
- Executive survey manager

The planning and coordinating committee consists of a board comprising representatives of the Education and Research Organization, the deputy on fishing and industries and the deputy on planning of IFC. The executive survey manager is the deputy on fishing and industries.

The planning and coordinating committee has four subcommittees in the southern littoral provinces of Iran. In each of the four southern littoral provinces, provincial communities comprise the executive body.

The main items of the survey are: specification of vessel and fishing site, method and tools of fishing, quantity and type of each of more than 51 fish varieties, water temperature at the fishing site, depth of fishing area.

In this survey three types of data forms are used for boat and launches, travel ships and *jal* and *moshta*. The results of the survey are published in a journal entitled *Southern fishing statistical findings* in the form of crossed tables.

### **5.2.2 Prawn fishing statistics**

The data on prawn fishing conducted in the summer and at the beginning of autumn on special shores are collected by the complete enumeration method by the southern fishing statistics organization on an annual basis; the result is published yearly.

## **5.3 International waters**

Although Iran is located in a low-rain area of the world, the numerous mountains, hills and valleys all over the country have created lakes, lagoons, semi-natural waters such as water intake lakes created by earth

dams, lakes created by concrete dams, artificial pools and canals, many of which are suitable places for fish reproduction and culture. Fish breeding and culture in many of these water intakes are recognized fish reproduction resources and recognized operators own them.

### **5.3.1 Statistical survey of fish reproduction farms (artificial water resources)**

This survey has been conducted four times, so far, by the complete enumeration method, in 1985 for the first time by SCI and three times at various intervals since then by IFC. The subject of the survey compares pools for reproduction of warm-water fish and canals for culture of cool-water fish. In the prevailing methods, the statistical organization functions in proportion to the volume of work, number of data collectors, and supervisors under the leadership of the executive manager in each province. The main items of the survey are quantity of fish produced, by species, fish breeding pool and canal area, various types of feed, expenditure and employment.

### **5.3.2 Collecting data on natural and semi-natural waters**

This survey was conducted once so far in 1996 by IFC and is to be repeated every five years. Its subject includes natural lakes, natural lagoons, and water intakes, lakes created by earth or concrete dams and canals. The formulation was prepared by the general fisheries office and the marine units of *Jihad sazandegi* throughout the country. The data collection method is complete enumeration; the questionnaire forms are submitted directly to the operator's local relevant people and local organization enumerators who also hold interviews with them. The main items under the survey are geographical characteristics of resource, breeding status, output, type of ownership, production system, area, volume and depth of resource, production cost, output value, investment amount and employment.

### **5.3.3 Registered reports**

Information regarding larvae and young fish breeding centres with a view to provide larva fish reproducing centres or to replenish the Caspian sea reserves is published in the form of administrative records by IFC.

#### **5.4 Other statistical activities on fishery**

Collecting data on wholesale and retail prices and on fishery production expenditure are conducted by IFC on an annual basis and the results are used in estimating the value added of fishery subdivisions.

The results of various fishery surveys are published in the *Iran fisheries yearbook*. A report is also forwarded to be published in the SCI yearbook and the *Jihad sazanegi* as a statistical record publication.

### **6. Problems**

The main problem of statistical surveys in the fields of livestock breeding, forestry and fishery is in the livestock subdivisions. The contribution of livestock is considerable in value-added procedures, but for various reasons there has been no data collection based on a scientific or statistical system for some eight years on the issue.

Over two million livestock breeders scattered all over the country, lack of an appropriate and up-to-date framework, and high allocation of credit are the main problems in the way of conducting a proper statistical survey.

As regards forestry, the land for which is owned by the government, the data on the forest area is not precise and up to date. Measures are being taken by the forestry and pastures organization to determine the precise area of forests and plantation by type, by using satellite technology and arial photos.

Collection and production of statistical data is satisfactory in the fishery sector. Considering the experience and activities of IFC in statistical affairs, there is sufficient ground for the development and upgrading of statistics to a comprehensive level in this sector.



## ORGANIZATIONAL SYSTEM FOR LIVESTOCK, FORESTRY AND FISHERIES SURVEY IN DATA COLLECTION LEVEL

