

# METHODOLOGY OF CROP ESTIMATION

## 1.1 Introduction :

The Directorate of Economics and Statistics (DES) releases estimates of area, production and yield in respect of principal crops of foodgrains, oilseeds, sugarcane, fibers and important commercial and horticulture crops. These crops together account for nearly 87% of agriculture output. The estimates of crop production are obtained by multiplication of area estimates by corresponding yield estimates. Therefore, the estimates of area and yield rates assume prime importance in the entire gamut of agricultural statistics.

## 1.2 Area Statistics:

From the point of view of collection of area statistics, the States in the country are divided into three broad categories:

- i. States and U.Ts. which have been cadastrally surveyed and where area and land use statistics are built up as a part of the land records maintained by the revenue agencies (referred to as "Land Record States" or temporarily settled states). The system of land records is being followed in 17 major states of Andhra Pradesh, Assam (excluding hilly districts), Bihar, Chhattisgarh, Gujarat, Haryana, Himachal Pradesh, Jammu & Kashmir, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh and Uttaranchal and 4 UTs of Chandigarh, Delhi, Dadra & Nagar Haveli and Pondicherry. These states/UTs account for about 86% of reporting area.
- ii. The states where area statistics are collected on the basis of sample surveys, a scheme for Establishment of an Agency for Reporting of Agricultural Statistics (EARAS) has been introduced in these states (Kerala, Orissa and West Bengal) and later on extended to Arunachal Pradesh, Nagaland, Sikkim and Tripura. The scheme envisages, inter-alia, estimation of areas through sample surveys in a sufficiently large sample of 20% villages/ investigator zones. These states account for about 9% of reporting area.
- iii. In the hilly districts of Assam, the rest of the states in North-Eastern Region, (Other than Arunachal Pradesh, Nagaland, Tripura and Sikkim), Goa, UTs of Andman & Nicobar Islands, Daman & Diu and Lakshwadeep where no reporting agency had been functioning, the work of collection of Agricultural Statistics is entrusted with the village headmen of the reporting area (5%).

While the area statistics are collected on complete enumeration basis in respect of states in category (i) above, on ad-hoc methods based on impressionistic approach in case of states in category (iii) above, a scheme for Establishment of Agency for

Reporting of Agricultural Statistics (EARAS) has been introduced in the states in category (ii) above for collection of data on sample basis.

### 1.3 Yield Estimates:

The second most important component of production statistics is yield rates. The yield estimates of major crops are obtained through analysis of Crop Cutting Experiments (CCE) conducted under scientifically designed General Crop Estimation Surveys (GCES). At present over 95% of the production of foodgrains is estimated on the basis of yield rates obtained from the CCEs.

The primary objective of GCES is to obtain fairly reliable estimates of average yield of principal food and non-food crops for States and UTs which are important from the point of view of crop production. The estimates of yield rates thus arrived at are generally adopted for the purposes of planning, policy formulation and implementation. The CCEs consist of identification and marking of experimental plots of a specified size and shape in a selected field on the principle of random sampling, threshing the produce and recording of the harvested produce for determining the percentage recovery of dry grains or the marketable form of the produce.

### 1.4 Coverage :

The crop-wise details of number of experiments planned under GCES during 2000-01 are given in table 1.1.

**Table 1.1 : No. of Experiments Planned under GCES During 2000-2001**

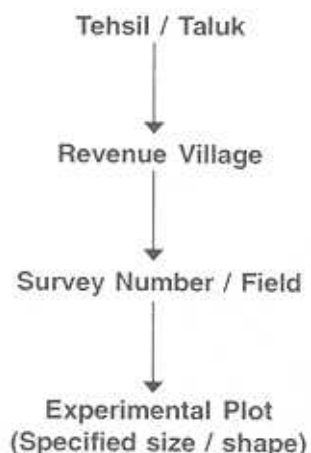
CropsType/Crop	No. of Experiments Planned		
	KHARIF	RABI	TOTAL
<b>FOOD CROPS</b>			
Paddy	99840	21255	121095
Wheat	-	61963	61963
Jowar	15202	13218	28420
Bajra	13292	-	13292
Maize	17704	-	17704
Ragi	7500	-	7500
Barley	-	3364	3364
Gram	-	18499	18499
Sugarcane	19801	-	19801
<b>NON FOOD CROPS</b>			0
Groundnut	17482	4291	21773
Sesamum	8556	3498	12054
Castor	1414	-	1414
Rapeseed& Mustard	-	16374	16374
Linseed	-	5666	5666
Cotton	11668	-	11668
Jute	4501	-	4501
Mesta	706	-	706
<b>Other Crops (Kharif &amp; Rabi)</b>			104176
<b>TOTAL ALL CROPS</b>			469970

Source : FOD, NSSO

## 1.5 Sampling Design :

Stratified multi-stage random sampling design is generally adopted for carrying out GCES with tehsils/ taluks/ revenue inspector circles/ CD blocks/anchals etc. as strata, revenue villages within a stratum as first stage unit of sampling, survey numbers/ fields within each selected village as sampling unit at the second stage and experimental plot of a specified shape and size as the ultimate unit of sampling as depicted in figure 1.1.

**Figure 1.1 SAMPLING DESIGN for GCES**



In each selected primary unit, generally 2 survey numbers/fields growing the experimental crop are selected for conducting CCE.

## 1.6 Advance Estimates of Area and Production :

Final estimates of production based on complete enumeration of area and yield through crop cutting experiments become available much after the crops are actually harvested. However, the Government require advance estimates of production for taking various policy decisions relating to pricing, marketing, export/import, distribution, etc. Considering the genuine requirement of crop estimates much before the crops are harvested for various policy purposes, a time schedule of releasing the advance estimates has been evolved. These estimates of crops are prepared and released at four points of time during a year as enumerated below: -

### 1.7 First Advance Estimates:

The first official forecast of area and production of kharif crop is prepared in the middle of September every year when south-west monsoon season is about to be over and kharif crops are at an advanced stage of maturity. This coincides with the holding of the National Conference of Agriculture for Rabi Campaign

where states bring assessments of their respective kharif crops. Although there is no specific guideline/methodology issued by the Department of Agriculture & Cooperation (DAC) to make the assessment, these are made by the State Governments based on the reports from the field offices of the State Department of Agriculture. They are mainly guided by visual observations. These are validated on the basis of inputs from the Space Application Center, Ahmedabad, the proceedings of Crop Weather Watch Group (CWWG) meetings, and other feedback such as availability of water in major reservoirs, availability/supply of important inputs including credit to farmers.

### **1.8 Second Advance Estimates:**

The second assessment for crop forecast is made sometimes in the month of January every year when the advance estimates of kharif crops prepared during the National Conference of Agriculture for Rabi Campaign may undergo a revision in the light of flow of more precise information from states. Around this time, the first advance estimates of rabi crops are also prepared. The Second Advance Estimates thus cover the second assessment in respect of Kharif Crops and the first assessment in respect of Rabi Crops.

### **1.9 Third Advance Estimates :**

The third advance estimates are prepared towards the end of March/ beginning of April every year when the National Conference on Agriculture for kharif campaign is convened and the states come up with their assessments for both kharif and rabi crops. The earlier advance estimates of both kharif and rabi seasons are firmed up/ validated with the information available with State Agricultural Statistical Authorities (SASAs), remote sensing data, reports of Market Intelligence Units (MIU) as well as the proceedings of CWWG.

### **1.10 Fourth Advance Estimates:**

The fourth advance estimates are prepared in the month of June every year when the National Workshop on Improvement of Agricultural Statistics is held. Since most of the rabi crops get harvested by the end of May, SASAs are in a position to supply the estimates of both kharif and rabi seasons as well as likely assessment of summer crops during the National Workshop. Like third advance estimates, the fourth advance estimates are duly validated with the information available from other sources.