

# **Estimate the Crop Production using Data Analytics**

## **Introduction:**

Crop Estimation Surveys is to obtain the estimates of average yield per hectare (productivity) and total production of principal crops at State levels by conducting crop cutting experiments.

Producers generally measure the amount of a particular crop harvested in a sample area to estimate crop yield. The harvested crop is then weighed, and the entire crop production of the area is approximated from the sample.

Doing a crop estimate is a method of measurement and forecasting whereby analysts or farmers predict or estimate the potential tonnage of a particular crop. This may be for a certain field or for a farm or even nationwide.

## **Literature survey:**

Here, we will look at all the previous solutions, attempts and implementations to the news tracker application or anything that is at least vaguely related to it.

## **Existing System:**

Information on crop area, yield and production plays a vital role in planning and allocating resources for the development of the agricultural sector.

The availability of crop area statistics is an essential requirement of the agricultural statistical system of any country, as it is a key variable in estimating crop production and crop yield.

For the collection of crop area statistics, both subjective and objective methods are currently used around the world. The subjective methods, often used in developing countries.

## **Case Study 1:**

Methodology for Estimation of Crop Area and Crop Yield under Mixed and Continuous Cropping.

## **Authors:**

Umesh Sud, Tauqueer Ahmad, Vk Gupta, Hukum Chandra – 2017.

## **Project Description:**

In this methodology has been developed to estimate crop area and crop yield in mixed and continuous cropping scenarios. In this regard, several alternatives have been considered, depending upon the information available in the agricultural statistical system. The different methods for the area apportionment of a crop mixture's various component crops are explained,

as are methods for crop area and yield measurement, along with their respective advantages and disadvantages. Situations in which particular methods are suitable are described.

### **Case Study 2:**

Crop Estimation Survey

#### **Authors:**

Directorate of Economics & Statistics – Meghalaya, Shillong.

#### **Project Description:**

The Directorate of Economics & Statistics, Shillong, has been conducting the Crop Cutting Experiment on different crops since the inception of the State on 21st January 1972. In fact, this work has been inherited from the Government of Assam after attaining the full fledged Statehood.

The Manual on Crop Estimation Survey – 2016 has been compiled for use in the Crop Cutting Experiment of different crops conducted by the Directorate of Economics & Statistics, Shillong. Now, the methodology developed by the Indian Agricultural Research Institute, PUSA, New Delhi, is used for the survey.

### **Case Study 3:**

Crop Estimation

#### **Authors:**

Viticulture Program, University of Nebraska Lincoln.

#### **Project Description:**

In this conventional crop estimation depends upon a reasonably accurate projected cluster size. The average weight per cluster for a given cultivar harvested from a particular vineyard is crucial to good crop estimation. The more years for which data have been acquired (a sort of “track record”), the better the accuracy of crop estimation. Lag phase crop estimation assumes that cluster weights double from the lag phase weight until the harvest weight. Lag phase occurs typically about 55 days after first bloom. Again, a representative sample of clusters needs to be collected and weighed then the weight doubled and used as the cluster weight.

## **Case Study 4:**

Crop production estimation using deep learning technique

### **Authors:**

Ashapurna Marndi, K. V. Ramesh and G. K. Patra

### **Project Estimation:**

Reliable estimation of crop requirement and production in advance, help policy makers to adopt timely decision for trade as export–import, which is a basic building block to assure food security of a country. A powerful and robust algorithm is essential to predict the future demand and production of a particular crop for subsequent years.

Deep learning methods are used successfully in solving different prediction problems of various applications. This study attempts to design an efficient AI based technique specifically using long short-term memory, a deep learning approach for estimation of crop production using crop production information of neighboring countries, which are part of the South Asian monsoon system. Detailed sensitivity analysis is conducted to identify the optimal combination of crop production of neighboring countries that directly and indirectly impact the crop production of India.

Here, we designed and developed a predictive model for rice production of India with lead time of one year using deep learning technique. Along with that, as there are significant influences of local climate (i.e. rainfall data) on crop production, that information was also considered along with crop production of neighboring countries. The results indicated that local and regional scale parameters jointly improve the prediction capability for future years.

