

# **A Study On India's Agricultural Crop Production Analysis (1997-2021)**

**BACHELOR OF SCIENCE IN MATHEMATICS**

**By**

**ANBURAJ M**

**(Reg. No. 10921201001)**

**ARIVUMATHI B**

**(Reg. No. 10921201002)**

**GAAYATHRI S**

**(Reg. No. 10921201003)**

**LINGADURAI P**

**(Reg. No. 10921201004)**

**NANCHIAL MANOMATHI A R**

**(Reg. No. 10921201005)**

**PUSHPARAJ E**

**(Reg. No. 10921201006)**



**DEPARTMENT OF MATHEMATICS**

**THIRUVALLUVAR ARTS AND SCIENCE COLLEGE**

**KURINJIPADI – 607302**

**AFFILIATED TO**

**ANNAMALAI UNIVERSITY**



**CATEGORY :**

**Data analytics with Tableau**

**PROJECT TITLE :**

**India's Agricultural Crop Production Analysis(1997-2021)**



## **INTRODUCTION:**

Let us analyze the Indian Agriculture crop production for the data collected from 1997 to 2022. Let us ask interesting questions on existing data, get production and area statistics and understand more on the Indian Agriculture history for crop production.

India is one of the largest producers of agriculture production in the world. It is the second largest producer in the wheat and rice. Wheat cultivation in India traditionally has been dominated by the northern region of India. The northern states of Punjab and Haryana Plains in India have been prolific wheat producers. While this cereal grass has been studied carefully in the past, recent years of painstaking research by India's finest scientific talent have paid off with the development of distinctly superior varieties of Durum Wheat.

## **1.1 OVERVIEW**

India's production of food grains has been increasing every year, and India is among the top producers of several crops such as wheat, rice, pulses, sugarcane and cotton. It is the highest

producer of milk and second highest producer of fruits and vegetables.

Agriculture is an important sector in India. It is indispensable for the sustenance and growth of the Indian economy. On an average, about 70% of the households and 10% of the urban population are dependent on agriculture as their source of livelihood. Today, India is a major supplier of several agricultural commodities like tea, coffee, rice, spices, oil meals, fresh fruits, fresh vegetables, meat and its preparations and marine products to the international market. India is a large producer of several agricultural products. In terms of quantity of production, India is the top producer in the world in milk and second largest in wheat and rice. Agricultural production is prone to several risks which affect both producers and consumers. In order to enhance investment and achieve a sustained increase in production, coherent and integrated long-term strategies and policies are required to reduce risk aversion and build flexibility among Indian rural producers. There is a need to provide remunerative prices for farmers in order to increase the incomes of farmers. In this research paper researcher's objective is to study the major agriculture crops production, export and import of agriculture crop wheat.

## **1.2 PURPOSE - India's Agricultural Crop Production**

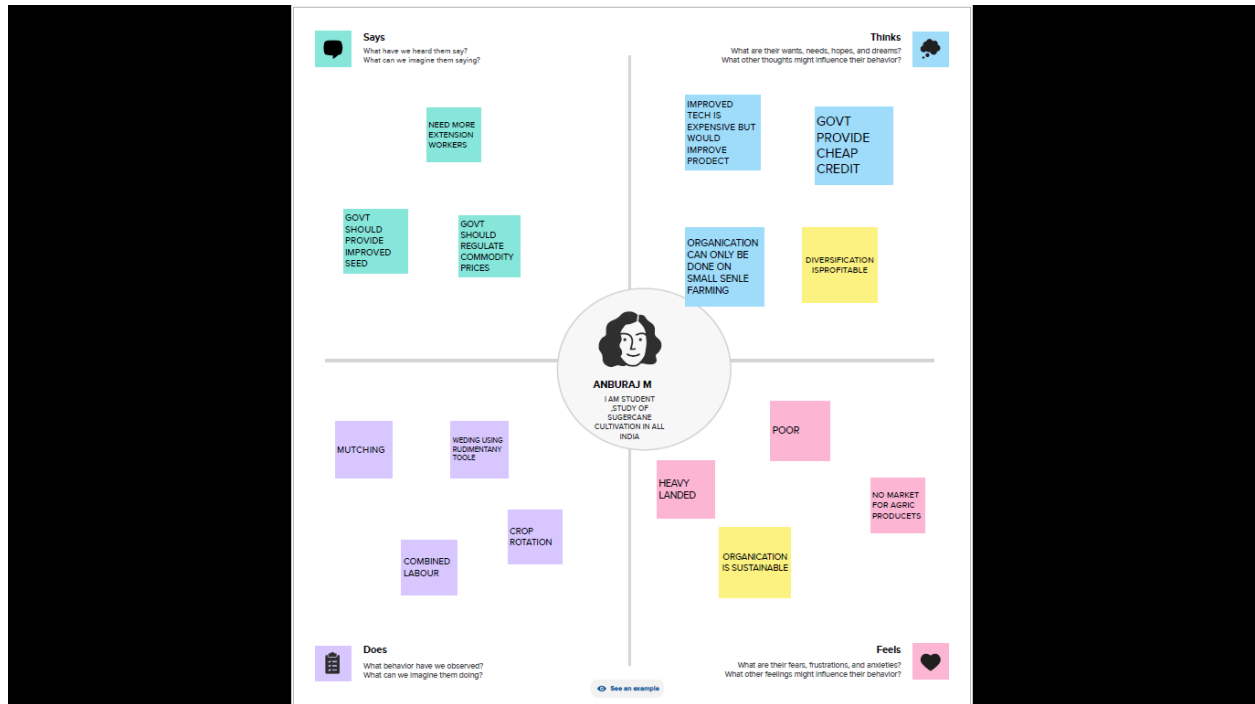
It transformed India from a food-deficit nation to a food-surplus country. India has achieved self-reliance in the production of food grains in the last several decades, and it is a mammoth achievement for our agriculture sector as well as the overall economy

India's food security depends on producing cereal crops, as well as increasing its production of fruits, vegetables and milk to meet the demands of a growing population with rising incomes.

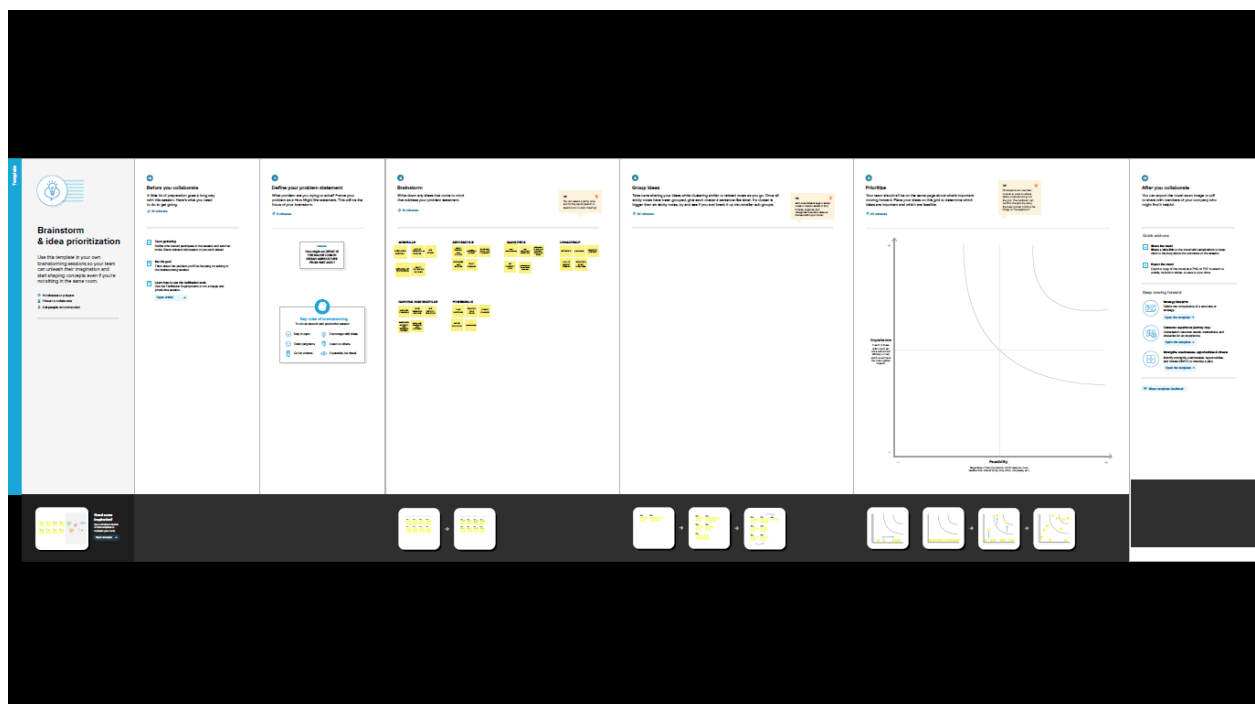
**Green Revolution:** that began in the 1960s enabled the nation to make great strides in domestic food production and significantly contributed to progress in agriculture and allied sectors. The main focus areas of the movement were,

- (a)** farm mechanization by substituting the use of cattle with modern tractors and other machinery to increase productivity,
- (b)** the use of hybrid varieties of seeds for better yield, and
- (c)** using the new dams constructed post-independence for better irrigation.

## 2.1 EMPATHY MAP

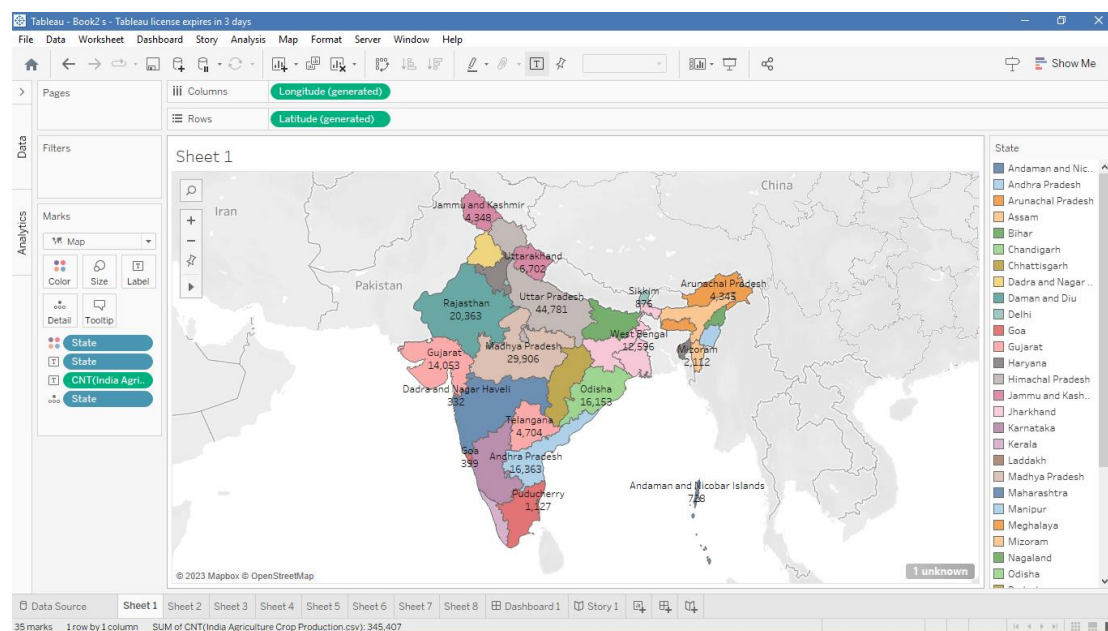


## 2.2 IDEATION AND BRAINSTORMING MAP



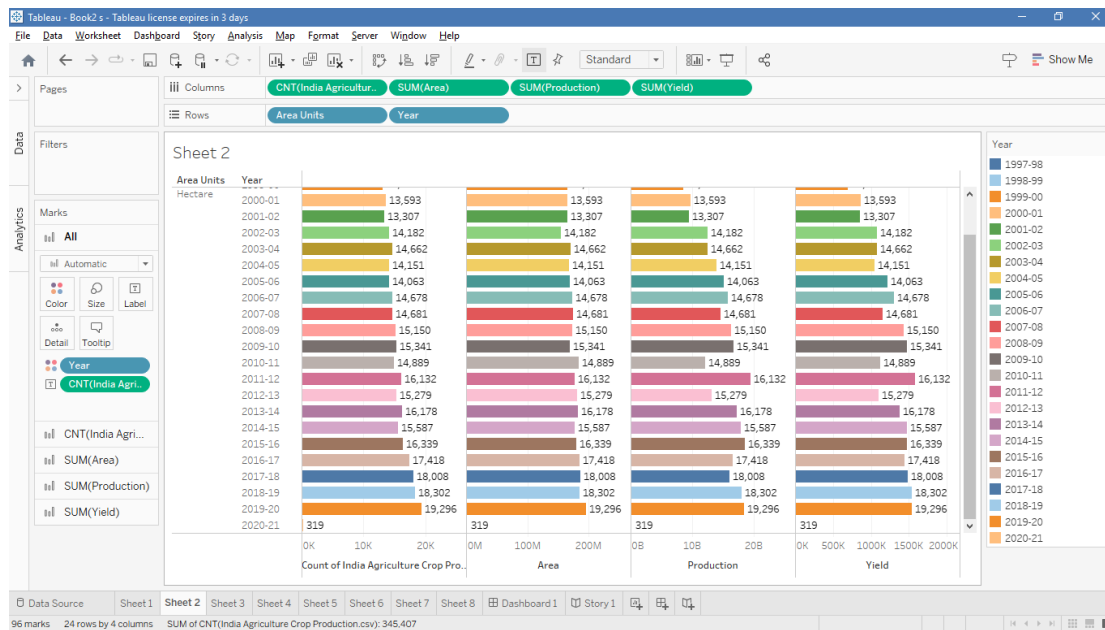
### **3. RESULT:**

India had a large and diverse agricultural sector, accounting, on average, for about 16% of GDP and 10% of export earnings. India's arable land area of 159.7 million hectares (394.6 million acres) is the second largest in the world, after the United States. Its gross irrigated crop area of 82.6 million hectares (215.6 million acres) is the largest in the world. India is among the top three global producers of many crops, including wheat, rice, pulses, cotton, peanuts, fruits and vegetables. Worldwide, as of 2011, India had the largest herds of buffalo and cattle, is the largest producer of milk and has one of the largest and fastest growing poultry industries



### **Major products and yields**

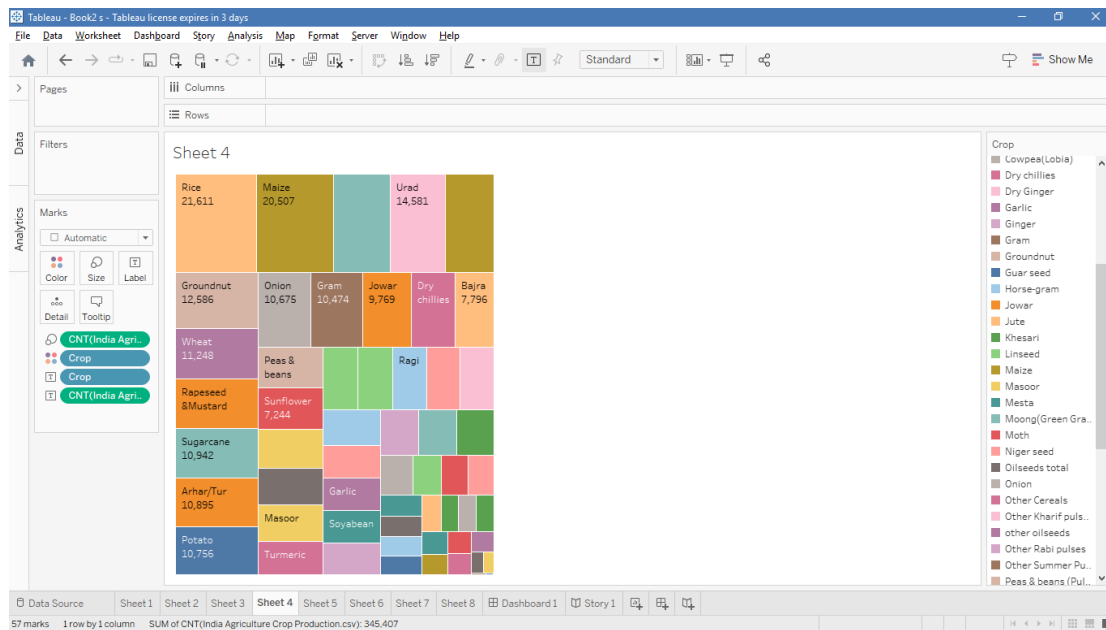
The following table presents the 20 most important agricultural products in India, by economic value, in 2009. Included in the table is the average productivity of India's farms for each produce. For context and comparison, included is the average of the most productive farms in the world and name of country where the most productive farms existed in 2010. The table suggests India has large potential for further accomplishments from productivity increases, in increased agricultural output and agricultural incomes.



## Organic agriculture

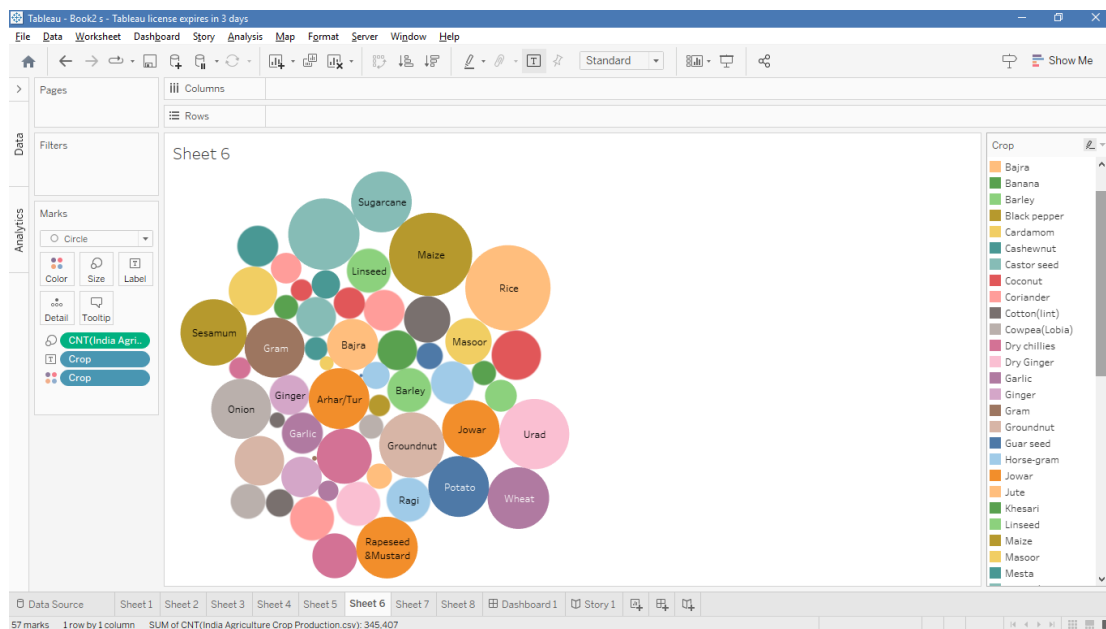
Organic agriculture has fed India for centuries and it is again a growing sector in India. Organic production offers clean and green production methods without the use of synthetic fertilisers and pesticides and it achieves a premium price in the market place. India has 6,50,000 organic producers, which is more than any other country. India also has 4 million hectares of land certified as organic wildculture, which is third in the world (after Finland and Zambia).[89] As non availability of edible biomass is impeding the growth of animal husbandry in India, organic production of protein rich cattle, fish and poultry feed using biogas methane/natural gas by cultivating *Methylococcus capsulatus* bacteria with tiny land and water foot print is a solution for ensuring adequate protein rich food to the population





## Marketing

As with sugar, cooperatives play a significant part in the overall marketing of fruit and vegetables in India. Since the 1980s, the amount of produce handled by Cooperative societies has increased exponentially. Common fruit and vegetables marketed by the societies include bananas, mangoes, grapes, onions and many others



## **4.ADVANTAGES & DISADVANTAGES:**

### **4.1 Advantages**

#### **Natural Environment**

Organic farming usually goes down in a natural environment. Unnecessary enclosures are not used for the crops or plants. This way the productivity is increased and is way better compared to closed spaces. An open and natural area for growing the crops would give them wild and instinctive growing nature. This is ideal for the crops and is one of the factors that leads to the plants being organic.

#### **No Chemicals**

Unlike other forms of farming, organic farming does not involve any artificial sources like chemicals to drive away pests or to speed up the process of farming. These chemicals are often used in commercial and industrial farming methods. However, organic farming stays true to its title. Its method is true to its natural core and does not use anything that may be of harm to its consumers. Any type of chemical is not entertained in the organic farming industry.

#### **Eye On You**

Unlike any other procedure, organic farming has a very strict supervision schedule. The reason for this extreme regulation is because of the importance to keep the label organic. It is very difficult to do so as most brands use artificial aspects in their farming. There are various **methods of organic farming** and its standards must be maintained in order to remain organic. This ensures that customers buying the end product receive what they're truly looking for.

#### **Environmentally Friendly**

Among the **advantages of organic farming**, this one stands out the most. Today, almost the entire sector of industrial farming consists of chemicals that ruin the environment. However, when you have something like organic farming to replace it, a huge benefit is received. Organic farming does not use any form of chemical nor does any form of pollution happen because of it. This makes it way better than regular farming. The whole world suffers because of the ignorant methods of regular farming including animals. Organic farming is definitely the way to go.

#### **Healthier And Tastier**

Since non-organic farming produces results that are way too suspicious when eaten, it is obvious that it isn't good for health either. **Organic farming in kerala** for example are known to keep the crops growing properly. They are given time and care unlike non-organic sectors that pump the results with chemicals in order for it to grow faster. These type of sectors are only commercial-minded and are least bothered about the satisfaction and health of the consumer. Since the fruits and vegetables grown organically are given longer time to flourish, they automatically are way better in terms of nutrition and taste.



## 4.2 Disadvantages

If you're looking to know **how to start organic farming**, these pointers should be kept in mind. Now that we've seen the positive side to organic farming, let us move on to the negative. Although it does have a lot of useful aspects, some things could go wrong. The following are the **disadvantages of organic farming**.

### Expensive Products

One of the major problems of organic farming methods is that sometimes it can get a bit costly. Some products related to organic farming are too expensive, leading to some common people to not be able to afford it. In a country like India where most of its livelihood are farmers, organic farming brings a huge problem to it. However, **organic farming in Tamil Nadu** have had some success stories.

### More Labor



Organic farming is a sector that requires a lot of patience. This is because pests and others obstacles must be tackled manually. Unlike in non-organic farming, the use of pesticides and other chemicals are not permitted. This makes the work of the farmer harder as constant attention and care is needed. Due to the constant attention, a lot of time is consumed. Organic farming has to be executed well which needs a lot of time and not to forget weed-prevention.

### High\_MRP

It is almost obvious that due to the extreme care taken to go along with organic farming, the results would be kept at a high price. Once sold to the market, most of the place is devoted to the sale of these organic fruits and vegetables. Most people do that approve

of organic products because of this. The items sold in the market are half the price of non-organic products. So, we can say that organic items are expensive and not every consumer is willing to pay the price for it.

### **Cross\_Breeding\_Problem**

The seeds of GMO plants once planted, create GMO crops. These crops then produce seeds and the pattern continues. This makes it very difficult to tell from the organic and GMO crops. This has become a huge problem in the organic farming sector. This could ruin the future of organic planting as a whole.

### **Labor\_Charges**

Labor charges refer to the amount payable to someone who has been involved in the building or working of something. Like we said earlier, in organic farming ventures, the amount of labor is high and it takes a lot of time and patience to get the work done. If one is not able to do it by oneself, a lot of labor would be hired which increases the payment that those laborers deserve.

## **5. APPLICATIONS:**



Information and Communication Technology (ICT) plays an important role not only in turning agriculture into socially, economically, and environmentally sustainable, but also in contributing to the delivery of nutritious and economical food for all. Increasing internet penetration in the states of India has led to the rise and development of mobile apps that are helping farmers with existing government schemes and other agriculture-

based information to reach them in rural India. This digital change is revolutionizing Indian agricultural conditions to a great extent.

### **KISAN SUVIDHA**

Kisan Suvidha helps farmers by providing relevant information on weather conditions for the next five days, dealers, market prices. Agro advisories, IPM practices, plant protection. Some unique features include extreme weather alerts, and market prices of commodities in the nearest area also, the maximum price in the state as well as in India. This app has empowered farmers in its best possible manner.

### **PUSA KRISHI**

This app was launched in 2016 by the Union Agriculture Minister to help farmers to get information about technologies developed by the Indian Agriculture Research Institute (IARI), which will help in increasing returns to farmers. The app also provides farmers with information related to new varieties of crops that were developed by the Indian Council of Agriculture Research (ICAR), resource-conserving cultivation practices, farm machinery, and its implementation will help in increasing returns to farmers.

### **IFFCO KISAN AGRICULTURE**

IFFCO Kisan is a subsidiary of Indian Farmers' Fertilizer Cooperative Ltd and the application was launched in 2015. They help Indian farmers to make decisions through customized information related to their needs. The user can also access a variety of informative modules that includes agricultural advisory, weather, market prices, agriculture information library in the form of text, imagery, audio, and videos in the preferred language at the profiling stage. The app offers helpline numbers to get in touch with Kisan Call Centre Services.

### **CROP INSURANCE**

This application is very useful for farmers in calculating insurance premium amounts for notified crops and provides information with cut-off dates and company contacts for their location and crops. It also works as a reminder and calculator for farmers about their insurance amount to be paid. This app can also be used to get details of the normal sum insured, extended sum insured, premium details, and subsidy information of any notified crop in any notified area. Information is linked to its web portal which caters to all stakeholders including farmers, states, insurance companies, and banks.

### **MKISAN APPLICATION**

This application has been designed and developed by the in-house team of DAC with help of C-DAC Pune. It enables all the stakeholders to obtain advisories and information

being sent by experts and government officials at different levels through MKISAN without registering in this portal

### **DIGITAL MANDI INDIA**

As the name suggests this app helps in knowing different Mandi prices from different states and districts. This application helps farmers, traders, and all others to know the prices by browsing through various commodities, simplified reach to the selected mandi, data synced with Agmarknet.nic.in.

### **PASHU POSHAN**

National Dairy Development Board has developed an android based software that optimizes the cost considering animal profile, like cattle age, milk production, fat in milk, feeding regime, etc., and also feed advisory to farmers were also given.

### **SIKKIM HORTICULTURE AND CASH CROP ASSISTANCE**

This application can be used for submitting an online application for obtaining departmental assistance for farmers in Sikkim.

### **APPLICATION FOR POULTRY**

The animal husbandry department of Himachal Pradesh has introduced a backyard poultry scheme which is centrally sponsored, where low input technology birds of colored, disease-resistant strains are supplied to farmers, with this app, farmers can avail the opportunity.

### **KHETI-BADI**

It is a social initiative app that aims to support organic farming with information regarding the same to farmers in India. This helps farmers to switch from chemical farming into organic farming.

### **MNCFC**

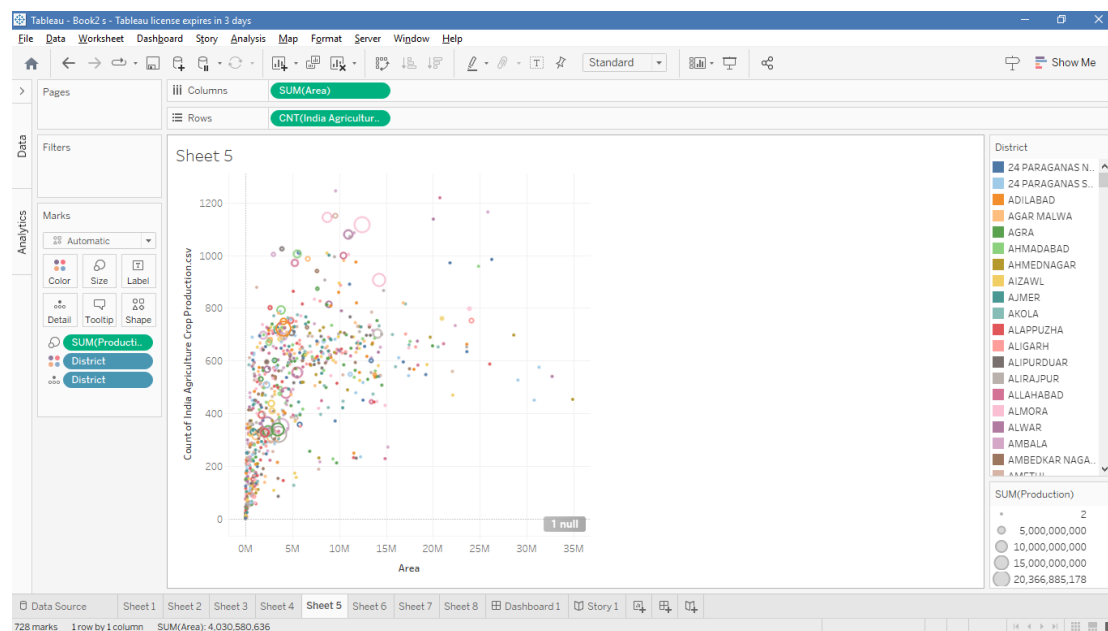
National Remote Sensing Centre, ISRO has developed his applications for field collection for crop assessment using satellite data under FASAL project of the Ministry of Agriculture. This app can be used to collect field photographs, GPS coordinates, and field information like crop type, condition, sowing date, soil type, etc., this information is used in creating a national geospatial database of crops.

### **CROP INFO**

Crop Info was developed by Nirantara Livelihood Resources Private Limited, Bangalore, and Karnataka an app that provides production technology of commercially important Horticultural and Agricultural crops, production aspects, post-harvest management, processing possibilities, and market information. Crop Info is specifically developed for students, faculty of Agricultural and Horticultural Universities, Subject Matter Specialists, Extension officials, private sector professionals, and farmers.

## **6. CONCLUSION:**

These agriculture apps provide farmers with date information about the latest technologies used in agriculture and helps to fill the information gap between the rural people and Government schemes in reaching them. These are Android apps for Indian farmers used in farming which provides them latest market rates, weather forecasting, information on Government policies and schemes for farmers, latest technology videos, news related to agriculture etc. Using these applications, one can directly ask questions to the agriculture experts and queries can be solved instantly by availing the audios and videos related to new technology, successful farming methods that can shape Indian agriculture.



## **7. FUTURE SCOPE**





Indian agriculture has now entered in a dynamic phase. The innovation of new seeds, use of farm chemicals and irrigation water had lead to “Green Revolution” after 1970. Presently, in the context to rapid agro-economic changes and globalization of system, a more complete development approach is needed. It should not only concern with producing competitive and quality farm produces, but also address issues of natural farm resource management, environmental support to farming and institutionalizing development linkage. Agricultural achievements in India during its 60 years of independence have been positive and changed the image of the country from food importer to potential exporter. However, in India population is growing at the rate of 1.9 per cent annually and reached to 1.21 billion in the year 2011. To keep pace with 10 current rate of population growth and consumption patterns, the requirement of food grains will reach to 246 million tones by the year 2020. There is a need to reduce crop losses from pests, diseases and weeds; and to promote fertilizer use efficiency to further increase the agricultural production. India is a leading agricultural country in the world. Presently, agricultural production (food grains, edible oils, pulses, vegetables, fish, milk, sugar, fibre and feed) is almost satisfactory to meet the current demand. But the estimates of requirement of food, feed, fibre and raw materials towards the middle of 21st century are likely to be doubled. The current trend of population growth has created alarming situation as the scope of increasing in area under cultivation is not possible besides possibility of reduction in area due to urbanization and infrastructural development. Thus, there is urgent need to accelerate the pace of agricultural growth in order to fulfill the expected needs. Indian agriculture has a wide scope to serve the human in future with reference to following aspects:

### **Food Security**

Advancement of civilization is closely related to agriculture. As 21st century has commenced it is high time to start anticipating challenges to be faced with their solutions.



Strategies are to be worked out to enhance agricultural production under all odds. The future requirements must be worked out looking in to changed food habits and change in standard of living. Vertical increase in the productivity appears to be solution to double the agricultural production. Therefore, cultivation of high yielding varieties with improved production technologies, efficient use of the available resources, including farm machineries and power, efficient use of agro-inputs, must be well known to the farmers. Proper training to the farmers and concerned persons is a must.

### **Efficient Use of Knowledge of Agricultural Sciences**

In pre-scientific agriculture, 6 persons could produce enough food for themselves and for 4 other persons. In years of bad harvest, they could produce only enough for themselves. With the development of agricultural science and application of advanced technology, 5 persons are able to produce enough for 95 others besides themselves. Agriculture as a science is derived with the integration of the knowledge of biology, physics, chemistry, economics, social science, geography, geology, agro-meteorology and engineering. There is tremendous development in the knowledge of these subjects. A good coordination is required to have multidisciplinary approach to advance the agricultural resources. Biotechnology and genetic engineering are important in evolving crop varieties with desired characters for future use. Development of New Plant Types As mentioned above, the crop canopies are not suitable to utilize the radiant energy efficiently, hence there is need to evolve such plant types in crops in future, which may be able to utilize the radiant energy maximum. For this purpose, the leaves of plants may be semi erect or erect with narrow lamina rather to drooping with broad lamina. The size of plants to be reduced with more economic yielding ability and thus, harvest index will be high. The small plants may be responsive to high level of fertilizer application and irrigation supplies resulting in high yields. The histology of plants may also be changed in future. At present, 33 per cent of synthesized food of plant is utilized for growth, but now it is discovered that more food material can be consumed by respiration through green tissues and it is known as photorespiration. The crops having ability of photorespiration result in poor photosynthesis owing to less yields. Therefore, now such plant types may be evolved, which have less or no photorespiration. 1.3.5

### **Development of Multiple Resistance Crop Varieties**

the advancement in biotechnology and genetic engineering, such varieties may be evolved, which have resistance against adverse effect of several biotic (insect-pests and diseases) and abiotic (climatic and cultural practices) stresses.

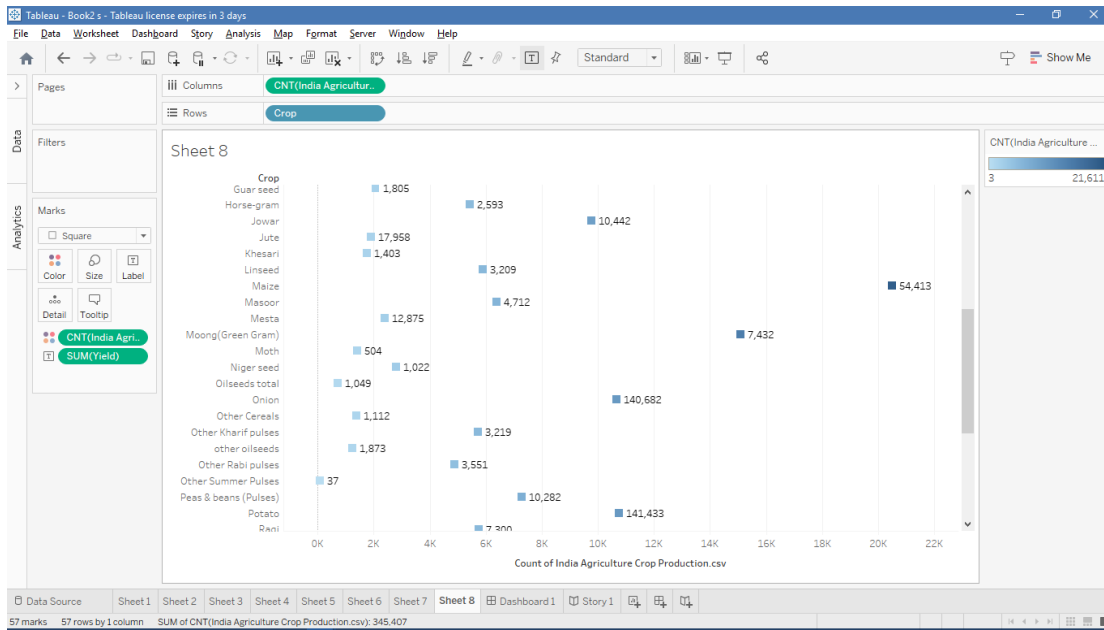
### **Commercialization of Agriculture**

The agriculture is not related only for arranging foods and other livelihoods, but it is a profession for raising the socio-economic status of an individual farmer as well as the nation. India has potential to become the world's largest exporter of agricultural products and also to become fourth largest economy after the USA, Japan, and China by the year 2020. However, failing on the farm front and not orienting its agricultural practices towards greater food production would mollify its prospects. Though there has been vast change in Indian agriculture resulting in self sufficiency of food, it is entirely a self contained system with the seed coming from the previous harvest, manures from the farm wastes and labour from the joint family, while produce is 12 meant primarily for family consumption. The occasional surplus in agricultural production due to favourable weather conditions is saved for lean year. After this, country has forced towards surplus farming, making use of the new agricultural technology as

well as agro inputs (seeds/fertilizer) developed by own or collected from external origin. In addition to this, the recent trends of liberalization and globalization are pushing farmers into global market competition. Thus, commercial agriculture has become insurable. At present on an average majority of Indian farmers are unaware about international market. Therefore, adequate efforts are needed to equip them for this purpose by building managerial confidence in farmers for commercial farming, development of adequate infrastructure for promoting commercial farming and making cooperative efforts for developing marketing and market intelligence.

### **Sustainable Agriculture After the independence,**

there was great challenge before the nation to achieve selfsufficiency in food grain production which has been achieved within a short period by following several strategies viz., expansion of area under crop, development of water resources for irrigation, development of policies for input supplies, markets infrastructure and evolution of high yielding varieties responsive to higher input etc. But increase in agricultural production has created many problems pertaining to land degradation, pesticide residues in farm produce, gene erosion, and atmospheric as well as water pollution in some areas. Sustainable agriculture is a form of agriculture aimed to maintain the pace of agricultural production with the burgeoning population without endangering the resource base of the future generation. Dependence on the use of synthetic fertilizers, pesticides, and other agro-chemicals to raise the vertical productivity is posing threat to ecologically fragile environment. Use of more irrigation water is looking serious challenges and meanwhile, injudicious use of irrigation is creating many serious problems in soils. Thus, sustainable agriculture is a balanced management system of renewable resources including soil, wildlife, forests, crops, fish, livestock, plant genetic resources and ecosystem without degradation and to provide food livelihood for current and future generation by maintaining or improving the ecosystem services of these resources. The sustainable agriculture system has to be economically viable, environmentally sustainable both with short and long term perspectives. Natural resources not only provide food, fibre, fuel and fodder, but also perform ecosystem services viz. detoxification of noxious chemicals within soils, purification of water, favourable weather and regulation of hydrological processes within watershed. It has to prevent land degradation and soil erosion. It has to replenish nutrients and control weeds, pests and diseases through biological and cultural practices. Thus sustainable agriculture can be based on natural farming or organic farming.



## 8. APPENDIX

```

File Edit Selection View Go Run Terminal Help
index.html - Visual Studio Code

C:\Users> SKVWC > Downloads > Arsha > index.html > PE > ang > ta > ta > tle > ta > ta > nk > nk > body > header>header.fixed-top. > div.container.d-flex.align-items-center

34 * Template URL: https://bootstrapmade.com/arsha-free-bootstrap-html-template-corporate/
35 * Author: BootstrapMade.com
36 * License: https://bootstrapmade.com/license/
37 ===== -->
38 </head>
39
40 <body>
41
42 <!-- ===== Header ===== -->
43 <header id="header" class="fixed-top">
44 <div class="container d-flex align-items-center">
45
46 <h1 class="logo me-auto"><a href="index.html">Co2</a></h1>
47 <!-- Uncomment below if you prefer to use an image logo -->
48 <!-- <a href="index.html" class="logo me-auto"></a>-->
49
50 <nav id="navbar" class="navbar">
51 <ul>
52 <li><a class="nav-link scrollto active" href="#hero">Home</a></li>
53 <li><a class="nav-link scrollto" href="#about">About</a></li>
54 <li><a class="nav-link scrollto" href="#services">Dashboard</a></li>
55 <li><a class="nav-link scrollto" href="#portfolio">story</a></li>
56
57 <li><a class="nav-link scrollto" href="#contact">Contact</a></li>
58 <li><a class="getstarted scrollto" href="#about">Get Started</a></li>
59 </ul>
60 <i class="bi bi-list mobile-nav-toggle"></i>
61 </nav>
62 <!-- .navbar -->
63
64 </div>
65 </header>

```

Ln 47, Col 20 Spaces: 2 UTF-8 CRLF HTML

31°C 11:35 AM 20-04-2023