

Project report on

India's Agricultural Crop Production Analysis(1997 – 2021)

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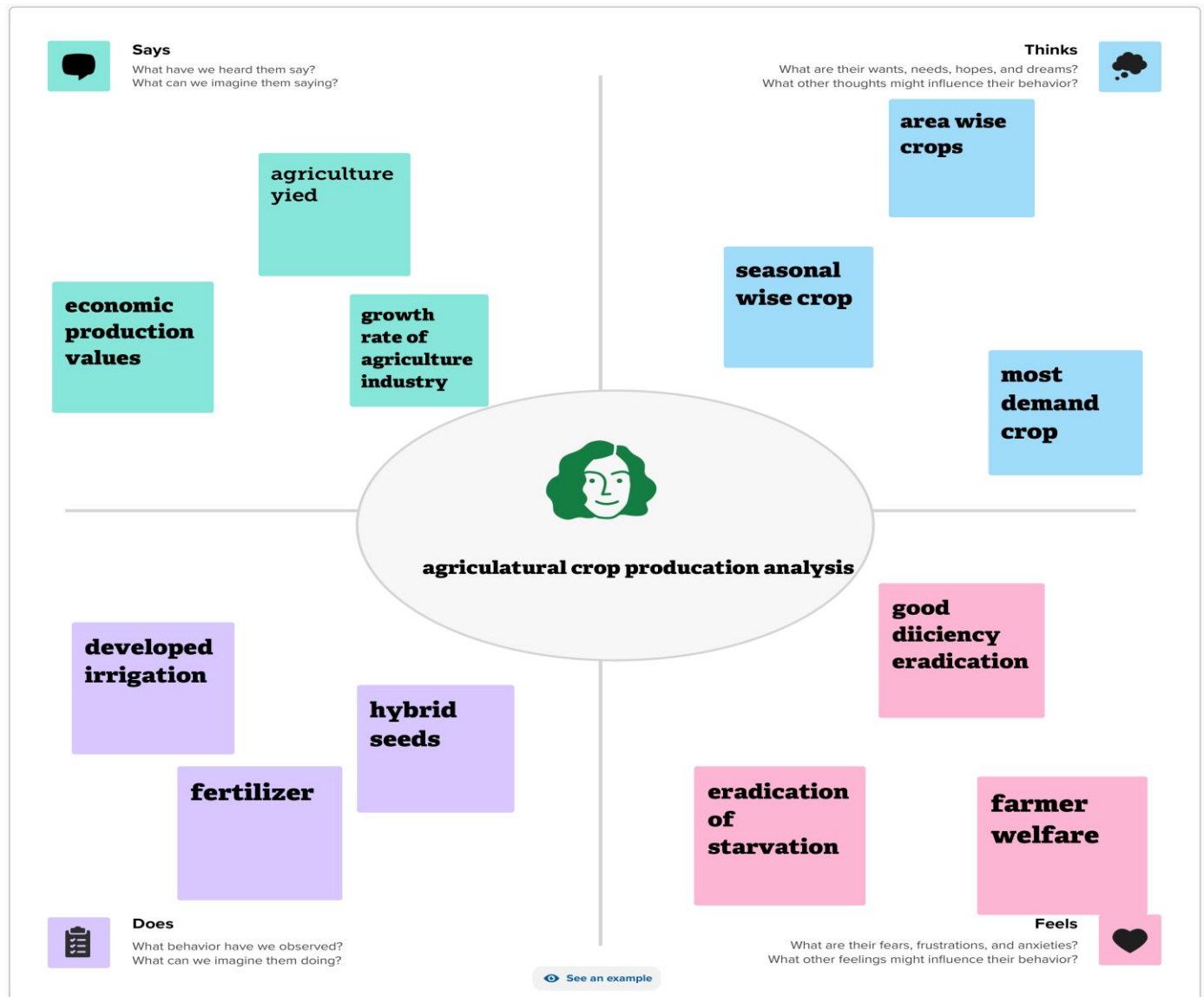
Introduction

This report delves into the captivating realm of India's agricultural cultivation, providing a comprehensive visual exploration of key aspects and trends in the agricultural sector. Through the visual representations, readers can gain valuable insights into crop production, seasonal variations, regional distribution, and overall production trends. These visualizations enable intuitive analysis, allowing stakeholders to uncover patterns, identify areas of growth or concern, and make data-driven decisions.

Purpose

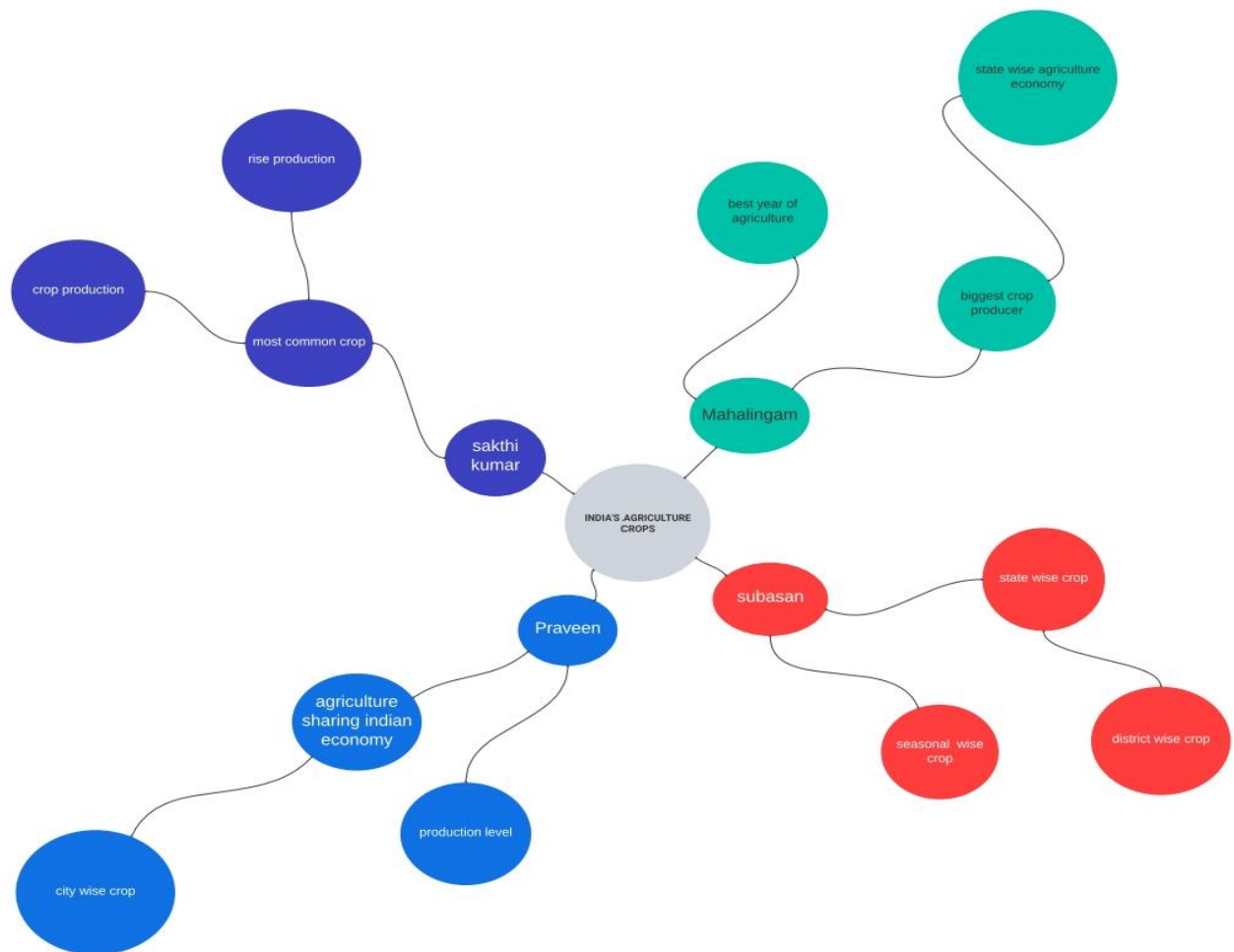
By harnessing the power of Tableau, this report not only presents the data in a visually appealing manner but also provides an interactive experience for readers to explore the intricacies of India's agricultural cultivation. To Extract the Insights from the data and put the data in the form of visualizations, Dashboards and Story we employed Tableau tool.

Problem Definition & Design Thinking



An empathy map is a collaborative visualization used to articulate what we know about a particular type of user. It externalizes knowledge about users in order to 1) create a shared understanding

of user needs, and 2) aid in decision making. This article is a guide to empathy mapping and its uses.



Brainstorming is a way of generating ideas and organising you're thinking on a topic. It can take shape as a simple list, an outline or a mind map. Once you have generated some ideas, you can evaluate and organise them, and narrow down your focus.

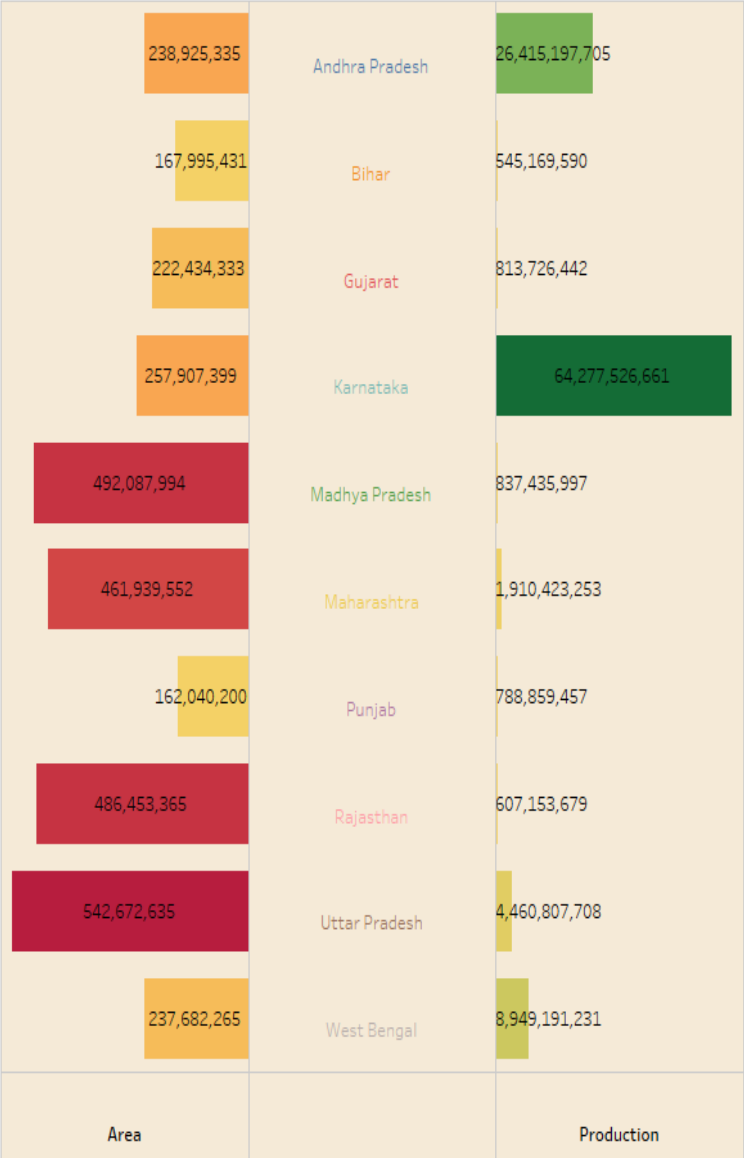
Result

Dashboard

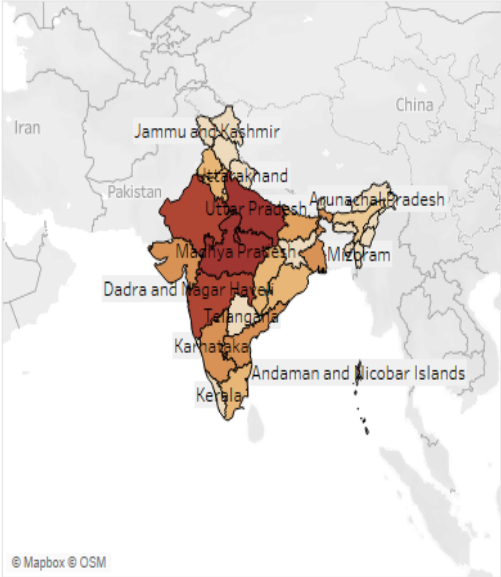
A dashboard is a way of displaying various types of visual data in one place. Usually, a dashboard is intended to convey different, but related information in an easy-to-digest form. And oftentimes, this includes things like key performance indicators (KPI)s or other important business metrics that stakeholders need to see and understand at a glance.

Dashboards are useful across different industries and verticals because they're highly customizable. They can include data of all sorts with varying date ranges to help you understand what happened, why it happened, what may happen, and what action you should take. And since dashboards use visualizations like tables, graphs, and charts, others who aren't as close to the data can quickly and easily understand the story it tells or the insights it reveals.

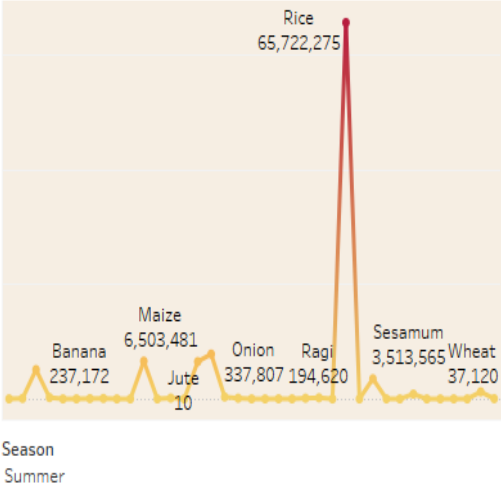
Area Vs Production



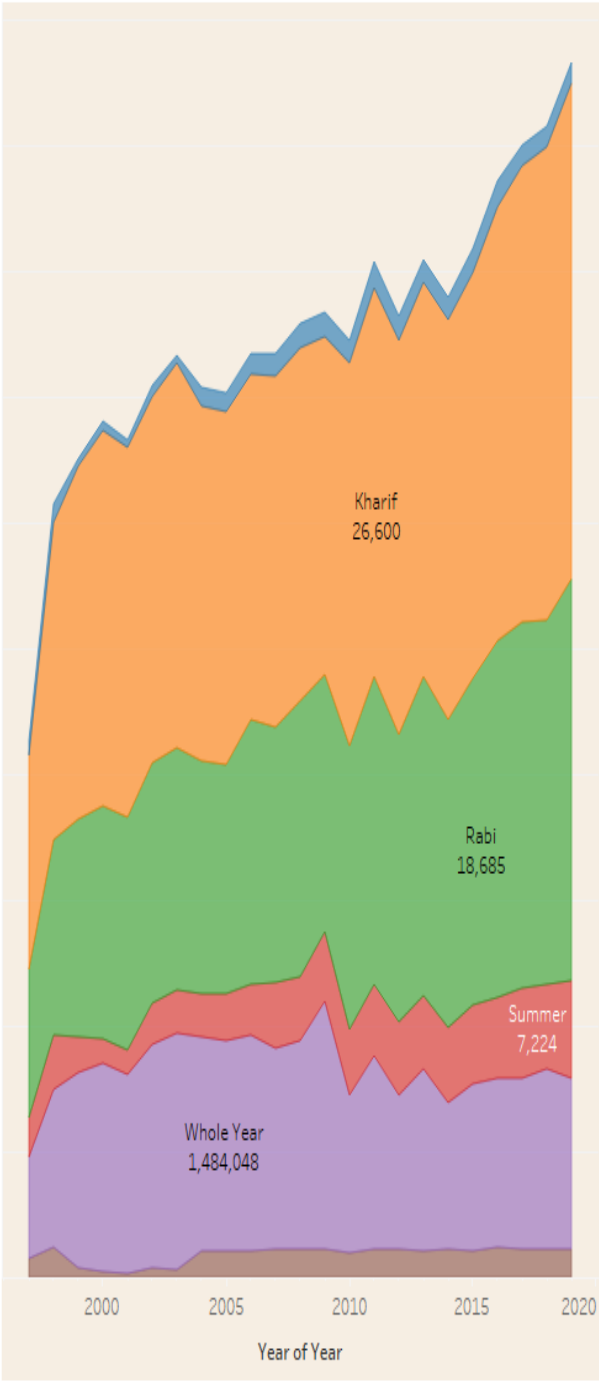
statewise Agricultural Land



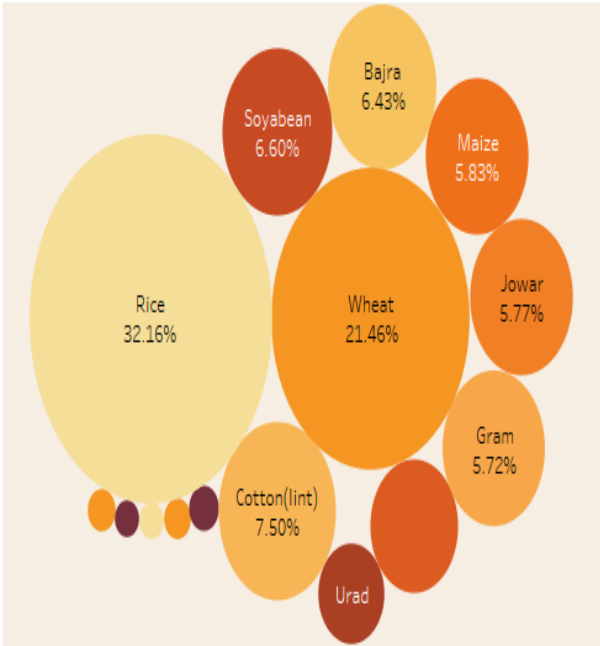
Season Based Cultivation area



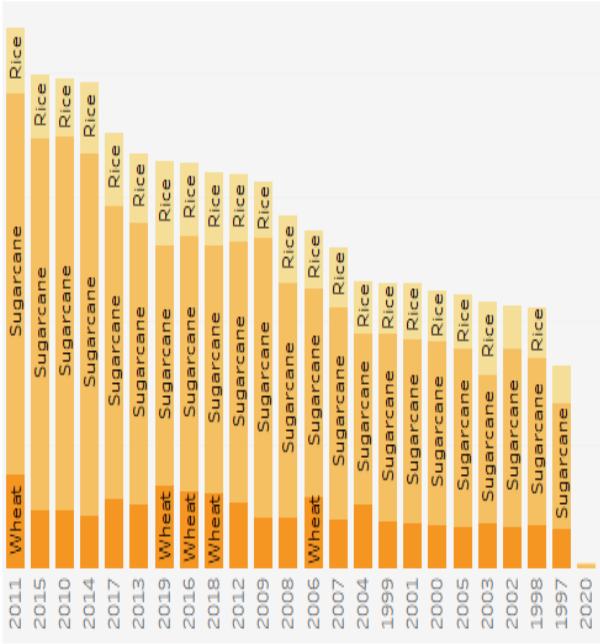
Yield by Season



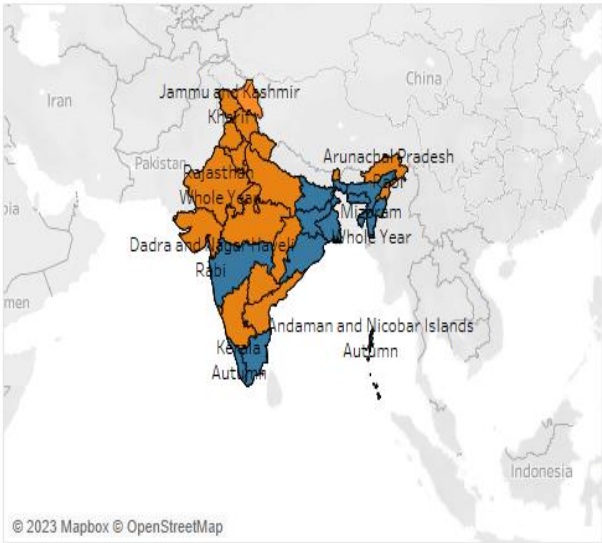
Crop Plantation by Area



Major Crops



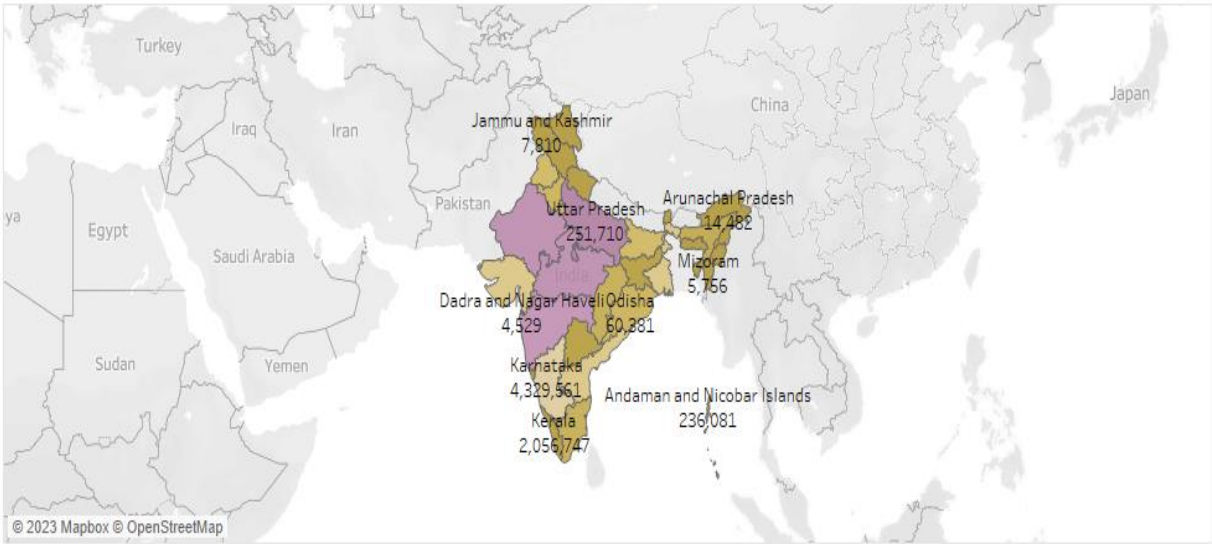
State wise season for crop production



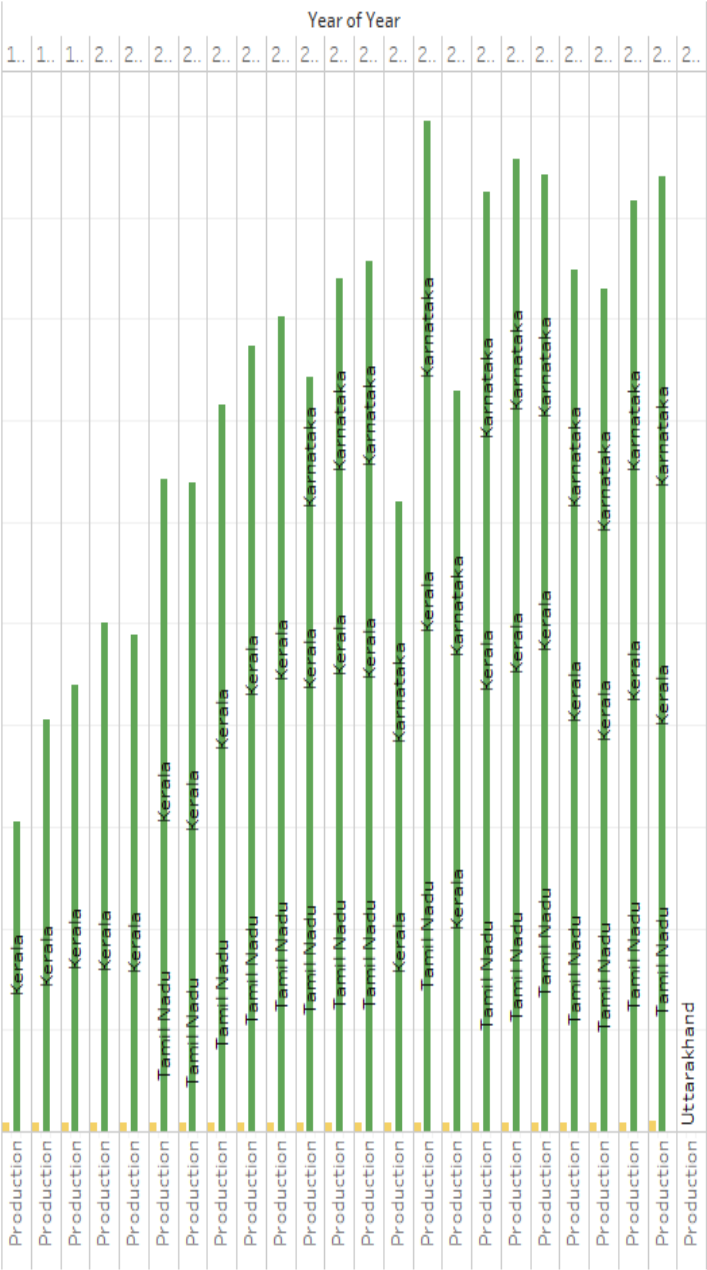
state wise corp production

Uttar Pradesh 4,460,807,708 251,710	Maharashtra 1,910,423,253 68,460		Andhra	West Bengal
Madhya Pradesh 837,435,997 111,190				
	Gujarat 813,726,442 78,596	Punjab 788,859,457		
Rajasthan 607,153,679 67,452		Haryana		
	Bihar 545,169,590	Odisha		Assam

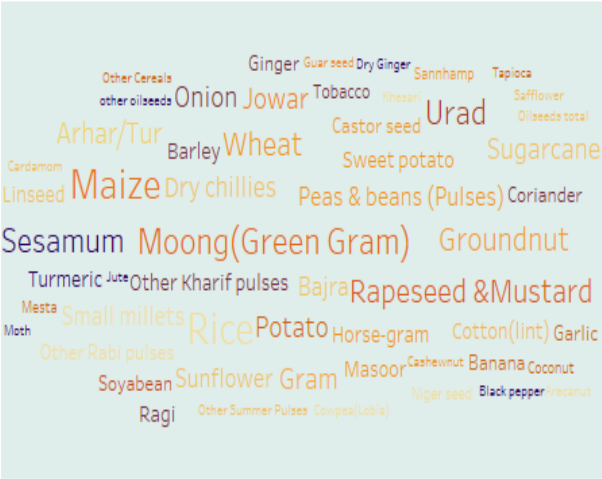
State wise yield



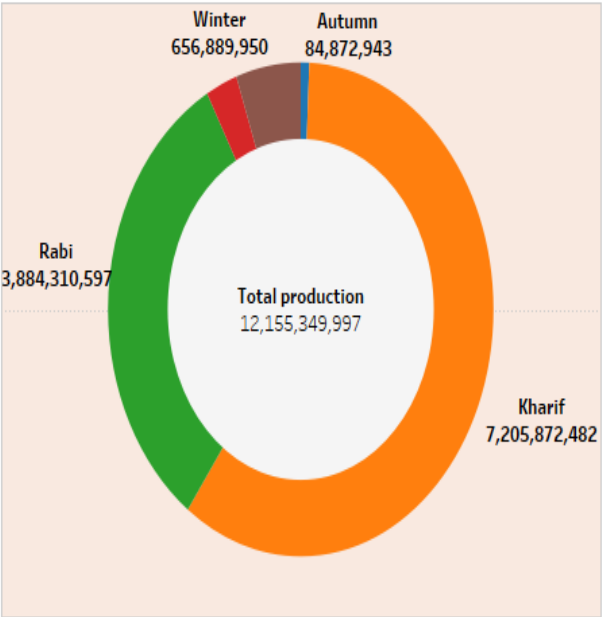
Year wise crop production



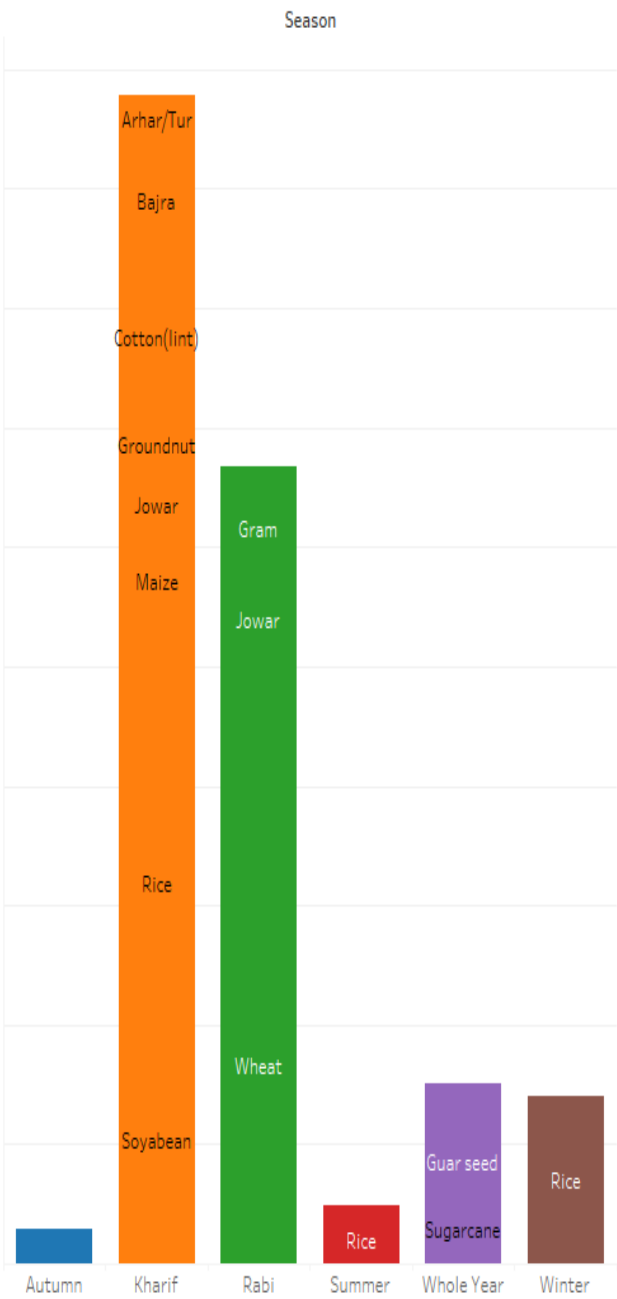
Crops(Plantation by count)



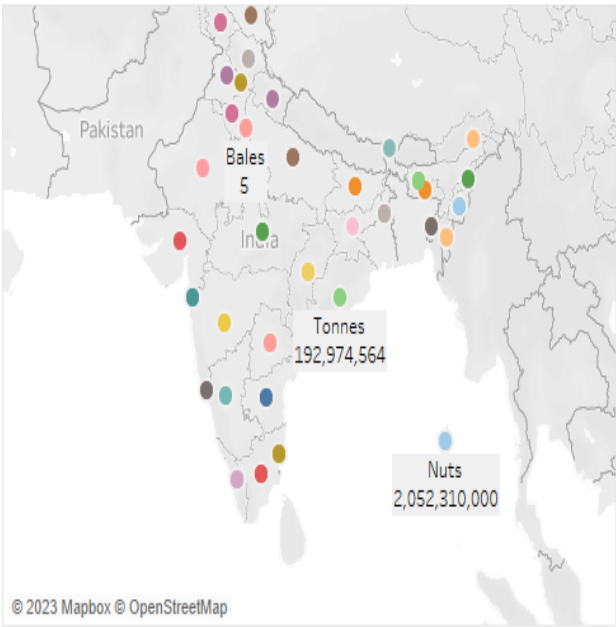
Season wise production



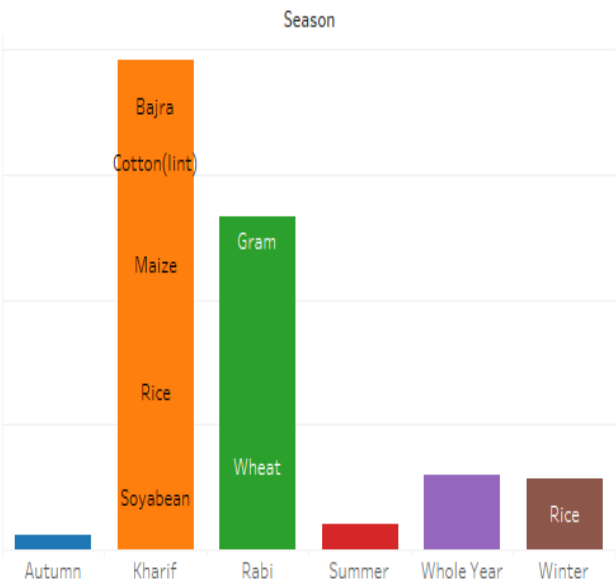
State wise summer crops



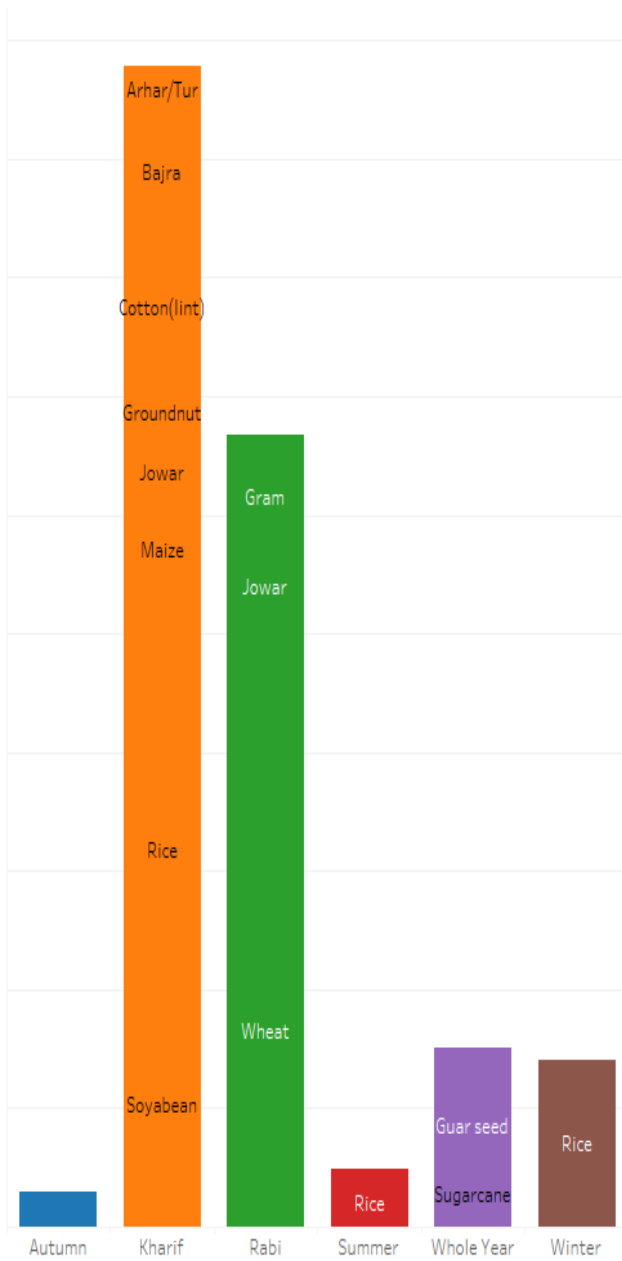
State wise banana and arecaunt production



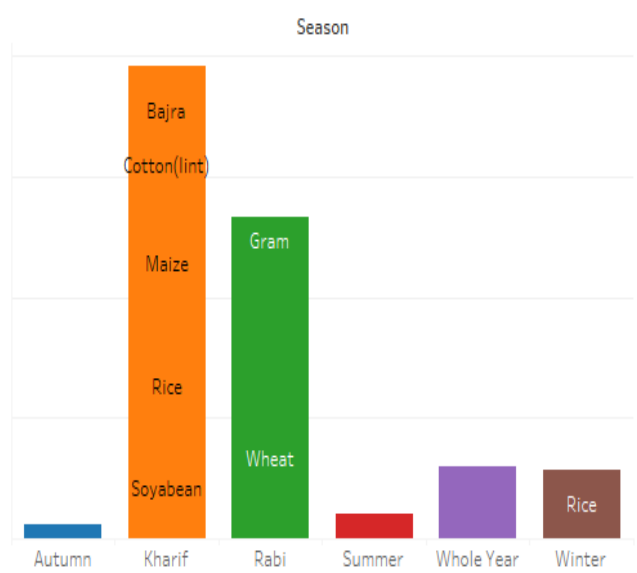
state wise spring crops



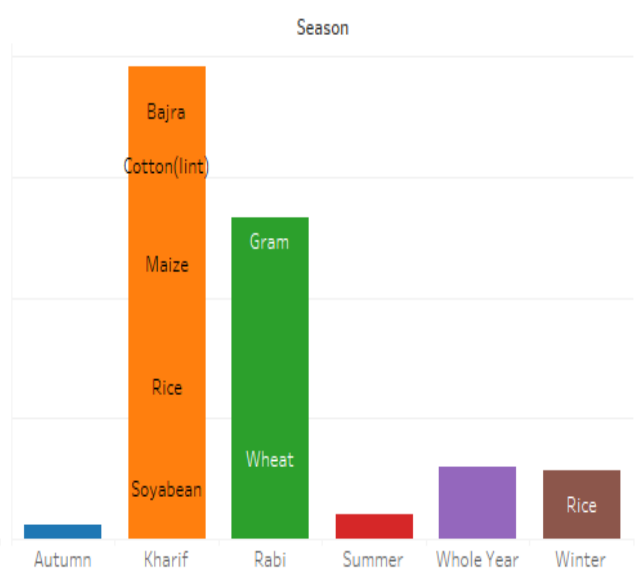
State wise winter season crops



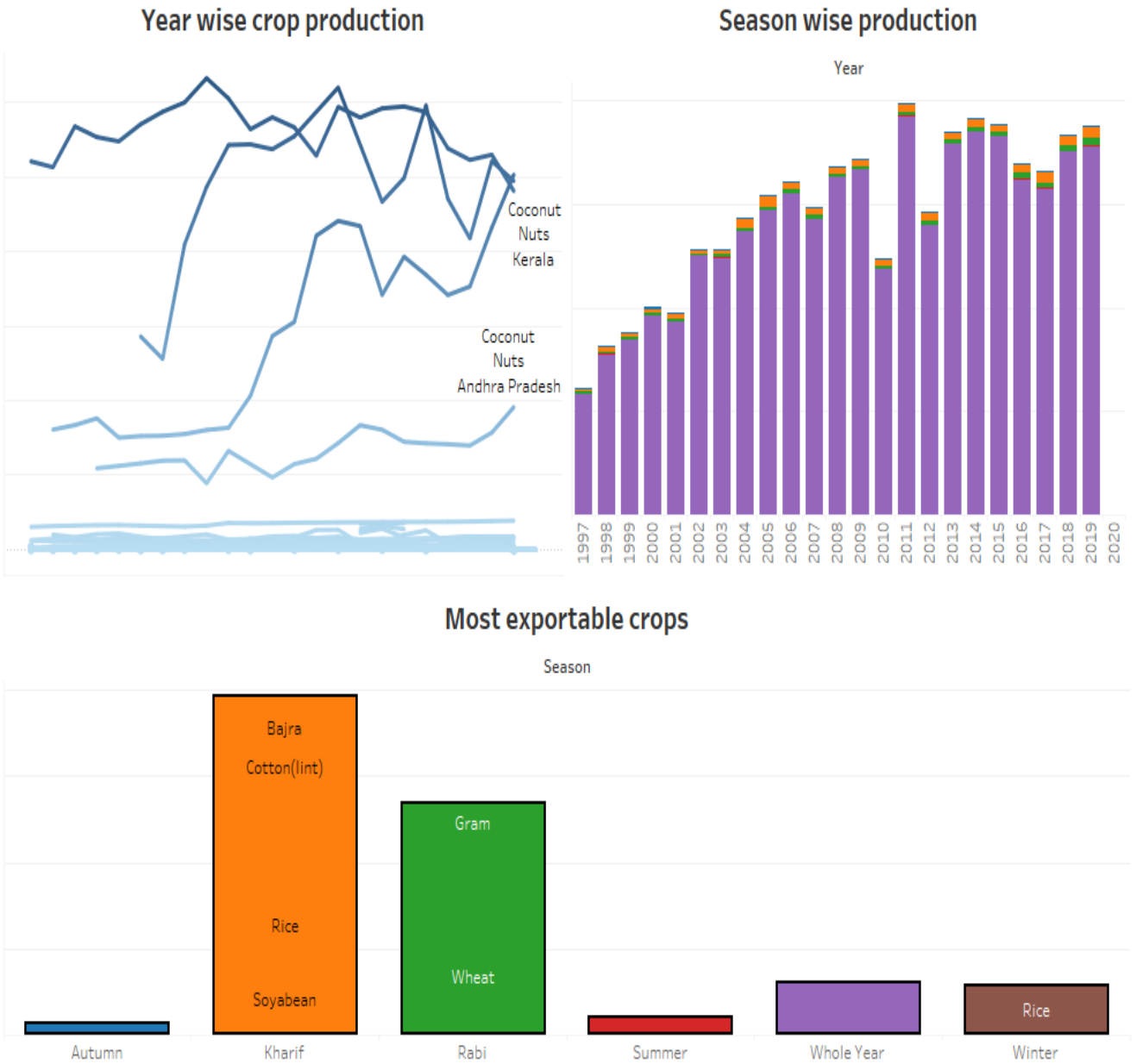
Least water-efficient crops



Most cultivated crops in india



Dashboard 7



story

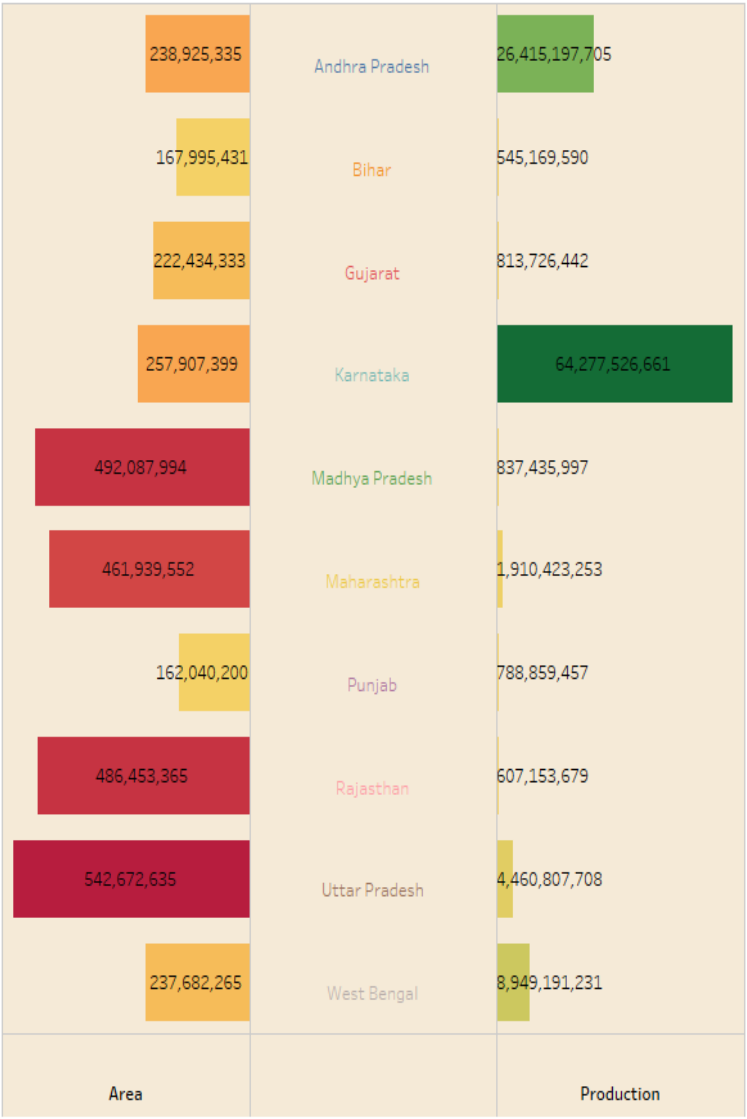
A **story** or **narrative** is a connected series of events told through words (written or spoken), imagery (still and moving), body language, performance, music, or any other form of communication. You can tell a story about anything, and the events described can be real or imaginary; covering both fiction and nonfiction; and leaving no topic, genre, or **style** untouched. There are stories about all things and all times; past, present and future. Whenever you're telling somebody about a series of events, you are telling a story, no matter what the subject nor when they occurred. As such, stories are of great value to human culture, and are some of the oldest, most important parts of life.

Aside from being a part of every single type of literature, stories are at the foundation of creativity and part of just about everything we do, particularly when it comes to entertainment, recording, and reporting of any form. So, they are shared in all different ways—from oral and written storytelling or journalism; to TV, film, and radio; to fine arts, stage performance and music; and so on.

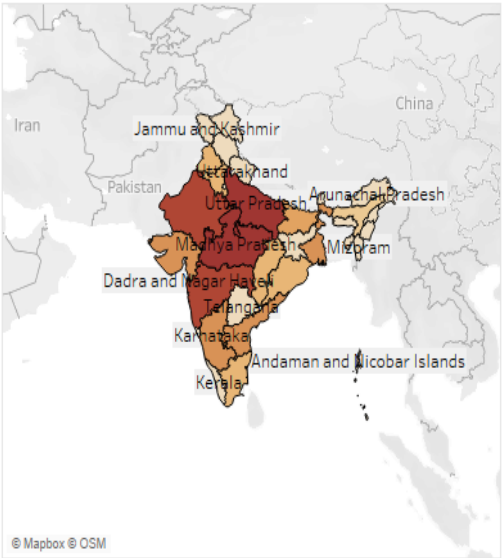
Story 1

Agricultural
area,production and
season based cultivat..

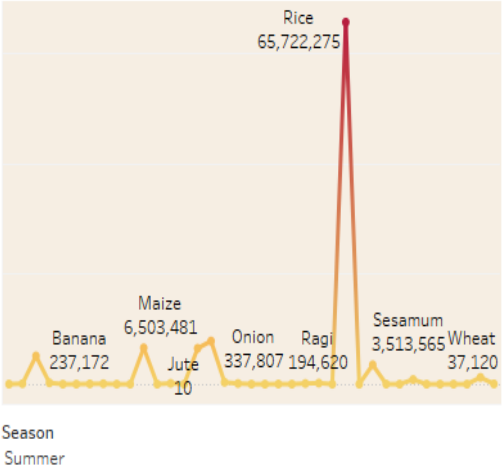
Area Vs Production



statewise Agricultural Land



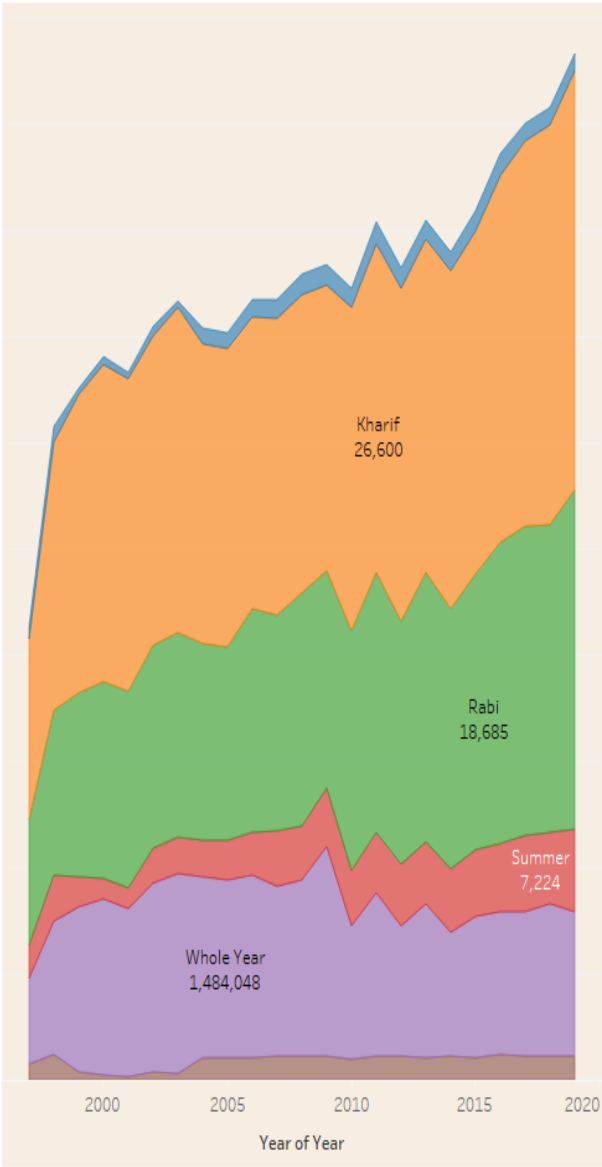
Season Based Cultivation area



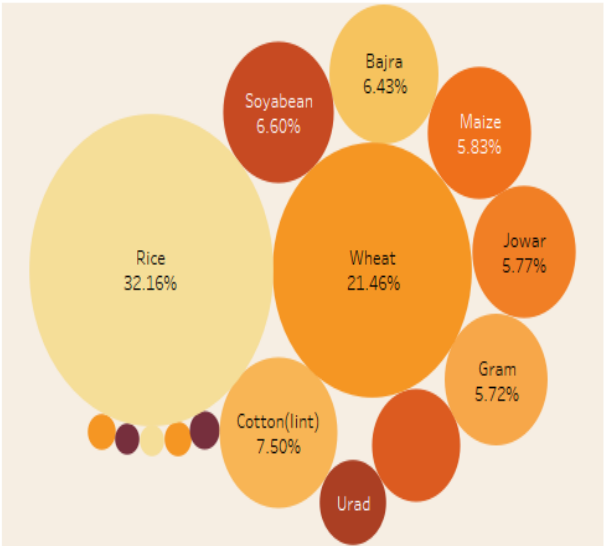
Story 2

yield seasons crop
plantation areas and
major crops

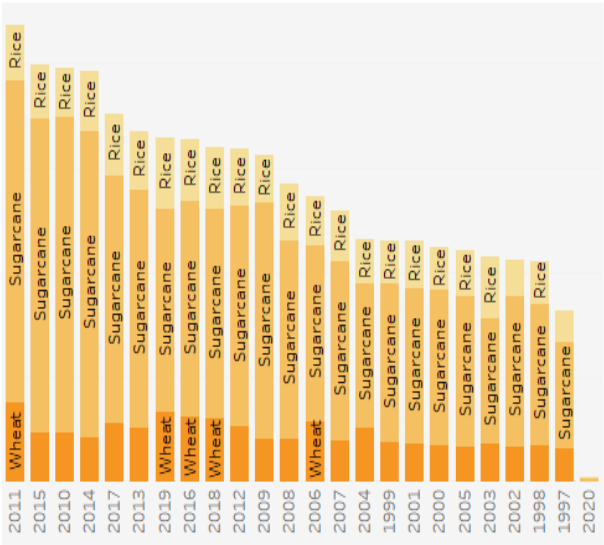
Yield by Season



Crop Plantation by Area



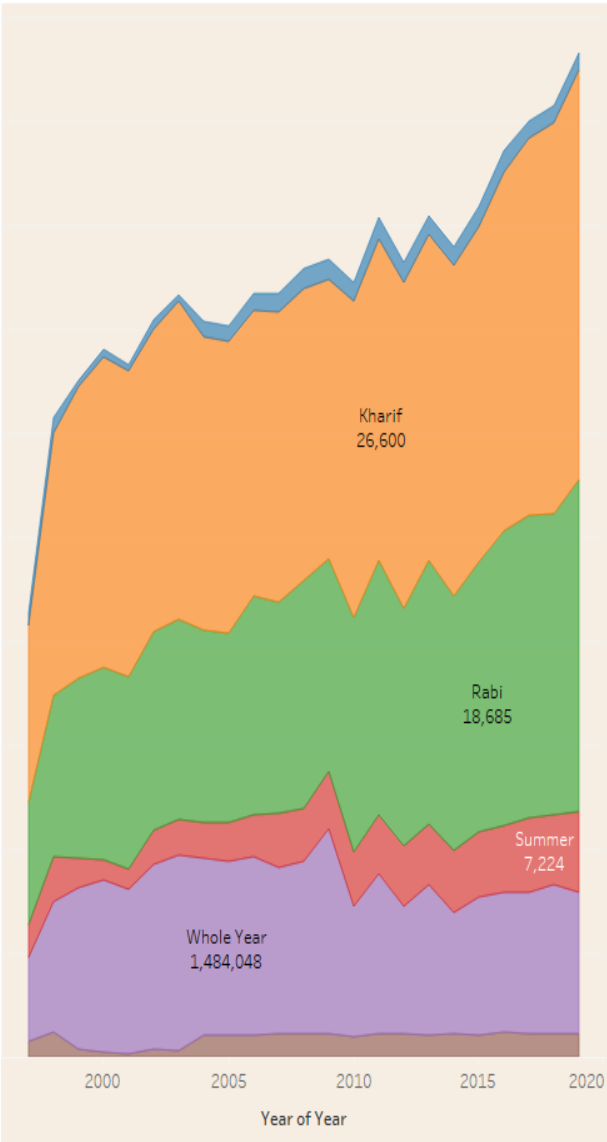
Major Crops



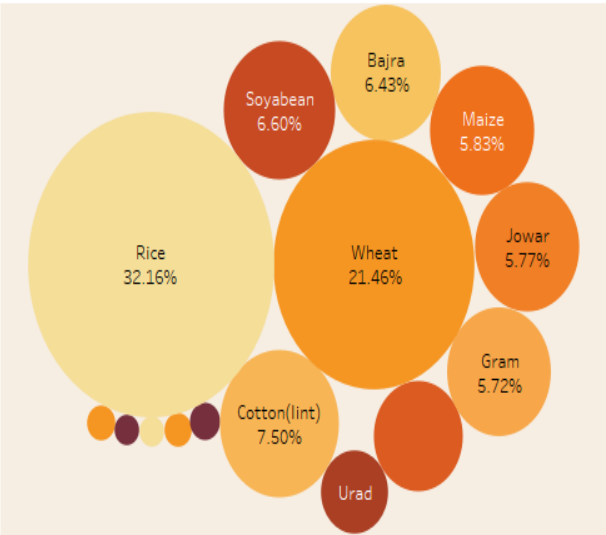
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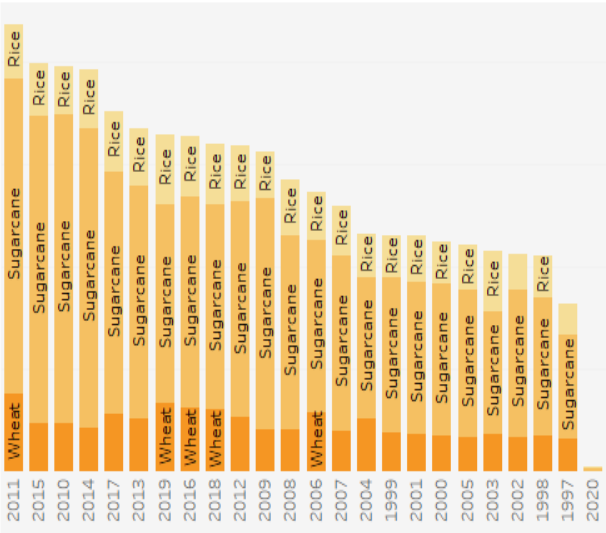
Yield by Season



Crop Plantation by Area



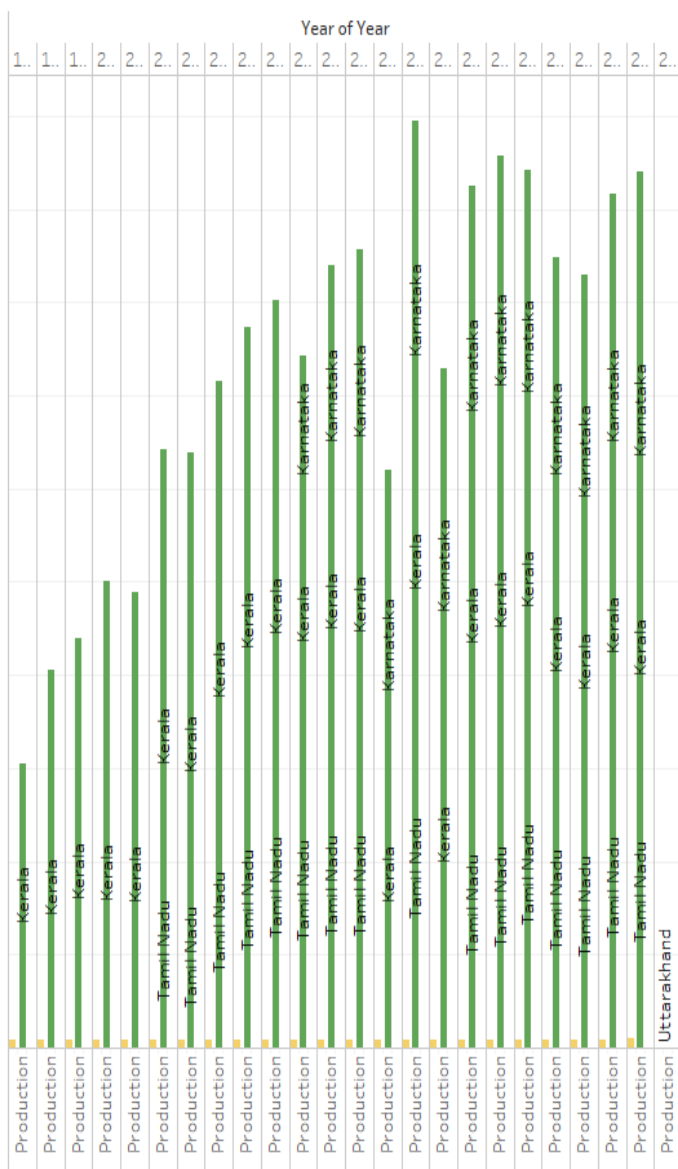
Major Crops



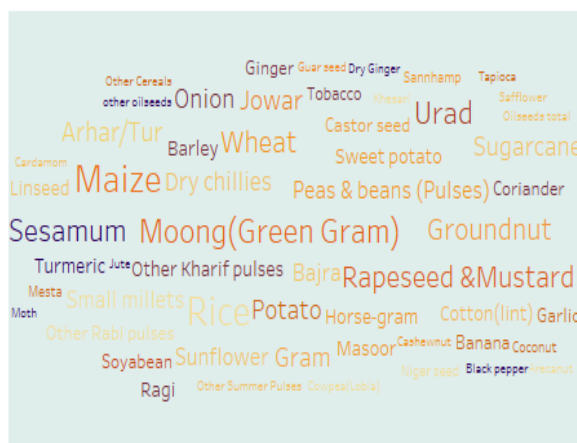
Story 3

Plantation crops, year
wise production and
season wise producti..

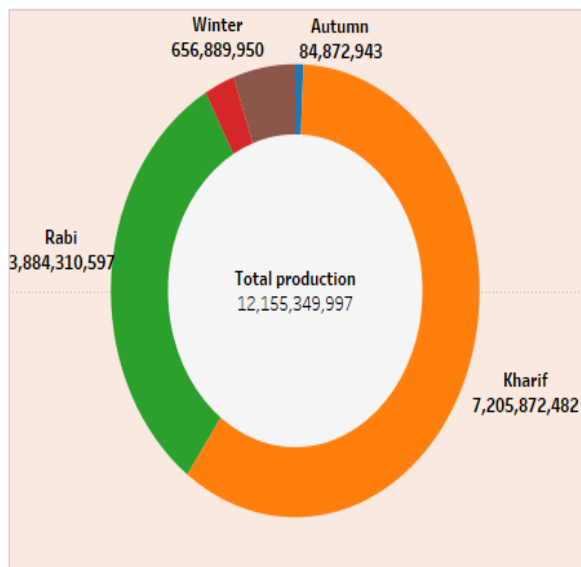
Year wise crop production



Crops(Plantation by count)



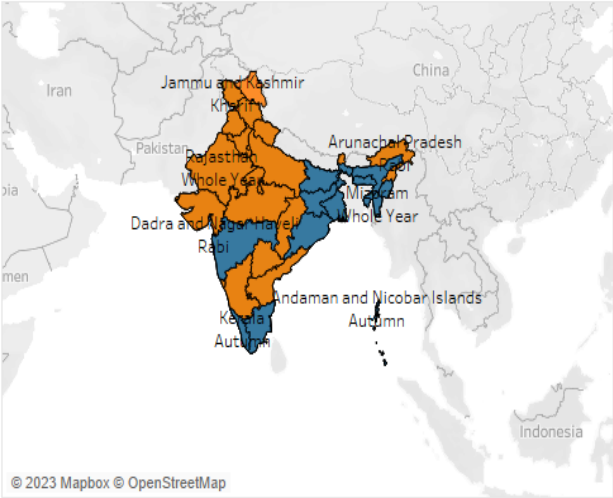
Season wise production



Story 4

State and season wise
crops and yield
production

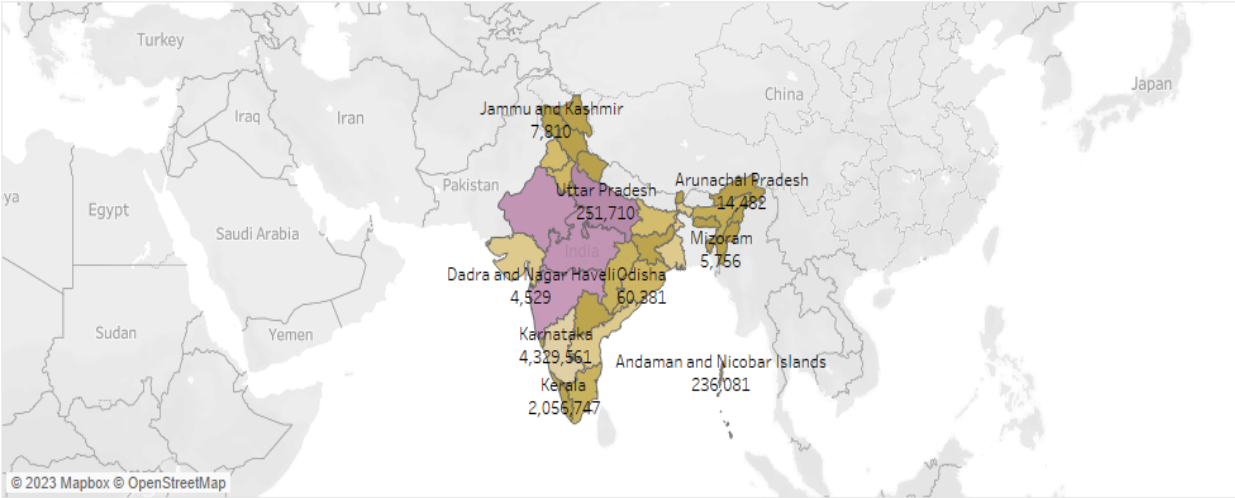
State wise season for crop production



state wise corp production

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		Odisha		Assam

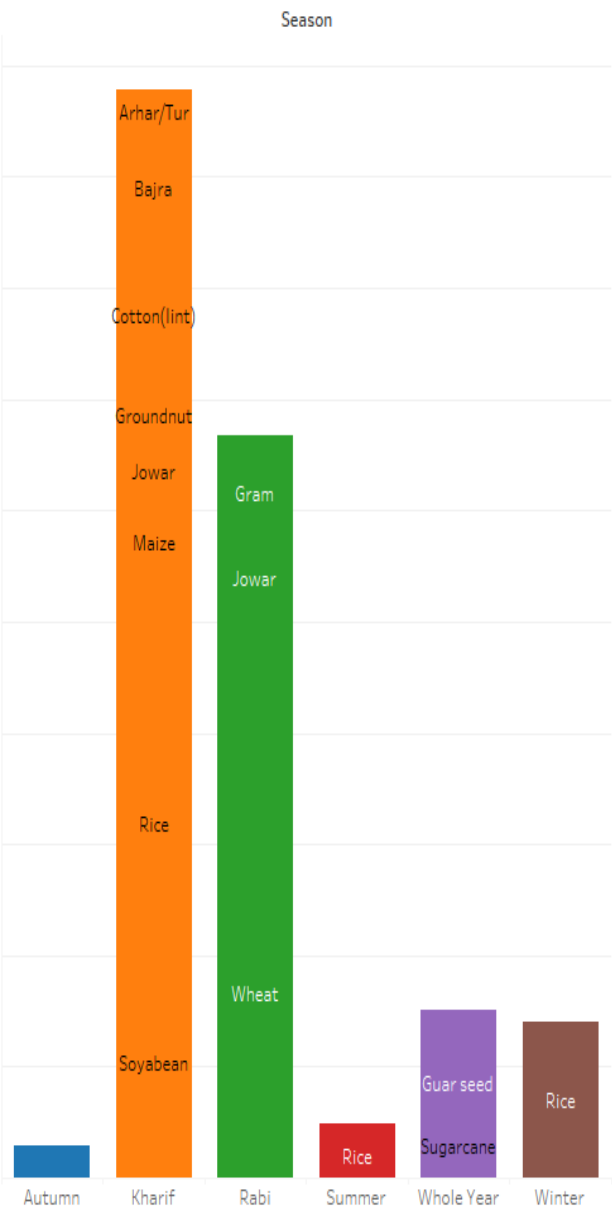
State wise yield



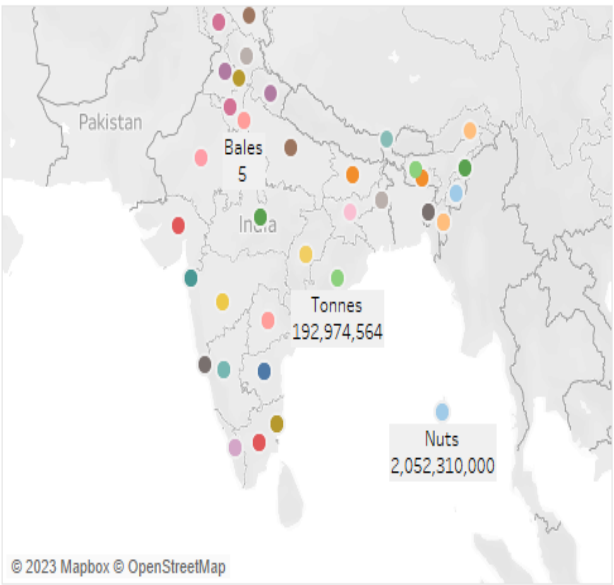
Story 5



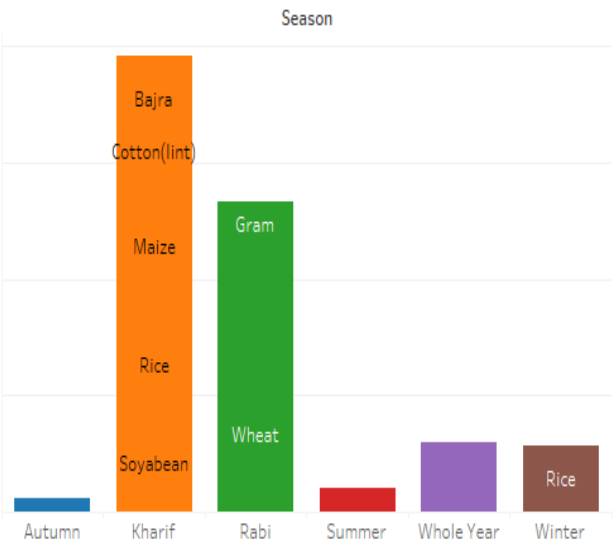
State wise summer crops



State wise banana and arecaunt production

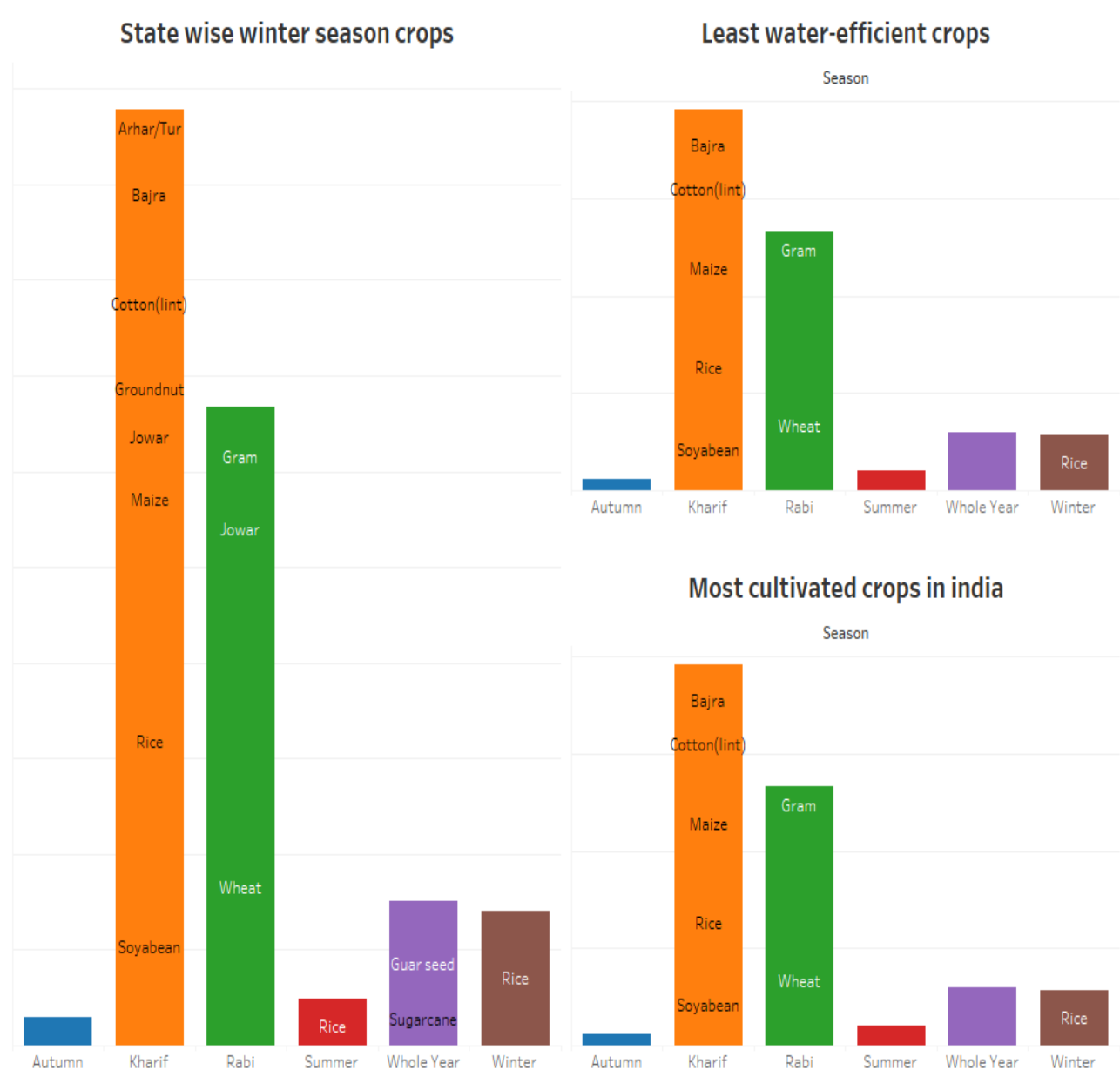


state wise spring crops



Story 6

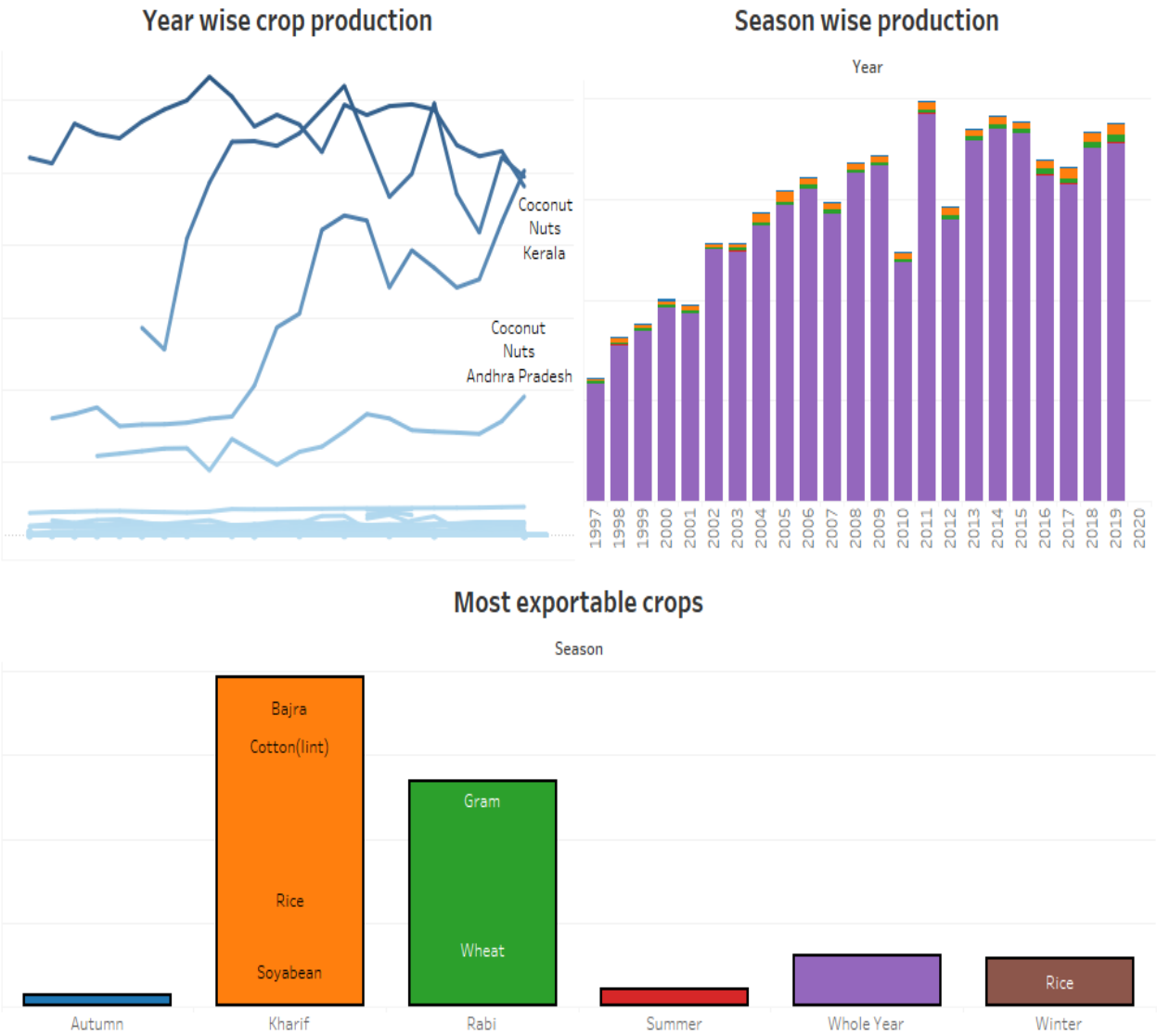
least water
efficient,most
cultivated and winter..



Story 7

Most
exportable,season
wise,year wise crop p..

Dashboard 7



Advantages of agriculture

Agriculture is an important part of economic management. In recent years, due to the popularization of the Internet, the adjustment of agricultural industry structure and the information management of agricultural industry have been accelerated.

The wide application of information technology in rural economic management can effectively promote the development of rural economy .

On this basis, this article studies the advantages and disadvantages of agricultural economic management information, such as modern production factors and agricultural economic information management by means of agricultural data collection.

Taking the agricultural economic management informationization as the experimental group and traditional agricultural economic management as the control group, the application research is carried out.

Disadvantages of agriculture

1. Inequality in Land Distribution:

The distribution of agricultural land in India has not been fairly distributed. Rather there is a considerable degree of concentration of land holding among the rich landlords, farmers and money lenders throughout the country. But the vast majority of small farmers own a very small and uneconomic size of

holdings, resulting to higher cost per units. Moreover, a huge number of landless cultivators has been cultivating on the land owned by the absentee landlords, leading to lack of incentives on the part of these cultivators.

2. Land Tenure System:

The land tenure system practiced in India is suffering from lot of defects. Insecurity of tenancy was a big problem for the tenants, particularly during the pre- independence period. Although the land tenure system has been improving during the post-independence period after the introduction of various land reforms measures but the problem of insecurity of tenancy and eviction still prevails to some extent due to the presence of absentee landlords and benami transfer of land in various states of the country.

3. Cropping Pattern:

The cropping pattern which shows the proportion of the area under different crops at a definite point of time is an important indicator of development and diversification of the sector. Food crops and non-food or cash crops are the two types of crops produced by the agricultural sector of the country.

As the prices of the cash crops are becoming more and more attractive therefore, more and more land have been diverted from the production of food crops into cash or commercial crops. This has been creating the problem of food crisis in the country. Thus after 50 years planning the country has failed to

evolve a balanced cropping pattern leading to faulty agricultural planning and its poor implementation.

Application of indian agriculture

Agriculture is one of the most fertile industries there are for artificial intelligence (AI) and machine learning (ML).

AI, machine learning and the Internet of Things (IoT) sensors that provide real-time data for algorithms increase agricultural efficiencies, improve crop yields and reduce food production costs.

Global spending on smart, connected agricultural technologies and systems, including AI and machine learning, is projected to triple in revenue by 2025, reaching \$ 15.3 billion.

IoT-enabled Agricultural (IoTAg) monitoring is smart, connected agriculture's fastest-growing technology segment projected to reach \$ 4.5 billion by 2025, according to PwC.

Indian Government, during 2020-21 and 2021-22, has allocated funds to the tune of INR 1756.3 cores and INR 2422.7 crores to the States for introducing new technologies including drones, artificial intelligence, block chain, remote sensing and GIS etc in agriculture.

Conclusion

In this project(Indian agricultural crop analysis (1997-2012), I have explained about the topic by providing full details on it.

This project also emphasises on main ideas related to the topic. I took the ideas and researched about this topic from the website and some books which are mentioned in the bibliography.

Future scope

Agriculture in India is livelihood for a majority of the population and can never be underestimated.

Although its contribution in the gross domestic product (GDP) has reduced to less than 20 per cent and contribution of other sectors increased at a faster rate, agricultural production has grown. This has made us self-sufficient and taken us from being a begging bowl for food after independence to a net exporter of agriculture and allied products.

Total foodgrain production in the country is estimated to be a record 291.95 million tonnes, according to the second advance estimates for 2019-20. This is news to be happy about but as per the estimates of Indian Council for Agricultural Research (ICAR), demand for foodgrain would increase to 345 million tonnes by 2030.

Increasing population, increasing average income and globalisation effects in India will increase demand for quantity, quality and nutritious food, and variety of food. Therefore, pressure on decreasing available cultivable land to produce more quantity, variety and quality of food will keep on increasing.

India is blessed with large arable land with 15 agro-climatic zones as defined by ICAR, having almost all types of weather conditions, soil types and capable of growing a variety of crops. India is the top producer of milk, spices, pulses, tea, cashew and jute, and the second-largest producer of rice, wheat, oilseeds, fruits and vegetables, sugarcane and cotton.

In spite of all these facts, the average productivity of many crops in India is quite low. The country's population in the next decade is expected to become the largest in the world and providing food for them will be a very prime issue. Farmers are still not able to earn respectable earnings.

Even after over seven decades of planning since the independence, majority of the farmers are still facing problems of poor production and/or poor returns. Major constraints in Indian agriculture are:

1. According to 2010-11 Agriculture Census, the total number of operational holdings was 138.35 million with average size of 1.15 hectares (ha). Of the total holdings, 85 per cent are in marginal and small farm categories of less than 2 ha (GOI, 2014).
2. Farming for subsistence which makes scale of economy in question with majority of small holdings.
3. Low-access of credit and prominent role of unorganised creditors affecting decisions of farmers in purchasing of inputs and selling of outputs

4. Less use of technology, mechanisation and poor productivity for which first two points are of major concern
5. Very less value addition as compared to developed countries and negligible primary-level processing at farmers level.
6. Poor infrastructure for farming making more dependence on weather, marketing and supply chain suitable for high value crops.

Future of agriculture is a very important question for the planners and all other stakeholders. Government and other organisations are trying to address the key challenges of agriculture in India, including small holdings of farmers, primary and secondary processing, supply chain, infrastructure supporting the efficient use of resources and marketing, reducing intermediaries in the market. There is a need for work on cost-effective technologies with environmental protection and on conserving our natural resources.

The reforms towards privatisation, liberalisation and globalisation affected inputs market at a faster pace. Agricultural marketing reforms after 2003 made changes in marketing of agricultural outputs by permitting private investment in developing markets, contract farming and futures trading, etc. These amendments in marketing acts have brought about some changes but the rate is less.

Along with this, the information technology revolution in India, new technologies in agriculture, private investments

especially on research and development, government efforts to rejuvenate the cooperative movement to address the problems of small holdings and small produce etc are changing face of agriculture in India.

Many startups in agriculture by highly educated young ones show that they are able to understand the high potential of putting money and efforts in this sector. Cumulative effects of technology over the next decade will change the face of agriculture.

All the constraints in agriculture make the productivity and returns complex but still a high untapped potential is there in India's agriculture sector.

Advantageous weather and soil conditions, high demand for food, untapped opportunities, various fiscal incentives given by the government for inputs, production infrastructure, availability of cheap credit facilities and for marketing and export promotion are attracting many individuals, big companies, startups and entrepreneurial ventures to do a lot of investments on innovations, inventions, research and development and on other aspects of business.

The efforts are being done to convert all the challenges in agriculture into opportunities and this process is the future of agriculture.

Key trends expected

1. Changing demand due to increase in incomes, globalisation and health consciousness is affecting and going to affect more

the production in future. Demand for fruits and vegetables, dairy products, fish and meat is going to increase in future.

2. Researches, technology improvements, protected cultivation of high value greens and other vegetables will be more. There will be more demand of processed and affordable quality products.

3. More competition will be there among private companies giving innovative products, better seeds, fertilisers, plant protection chemicals, customised farm machinery and feed for animals etc in cost effective ways at competitive prices giving more returns on investment by farmers. Use of biotechnology and breeding will be very important in developing eco-friendly and disease resistant, climate resilient, more nutritious and tastier crop varieties.

4. Some technologies will be frequently and widely used in future and some will become common in a short time while some will take time to mature. For producing the same products in other way so as to use resources judiciously and using new resources also like hydroponics, use of plastics and bio-plastics in production. There will be more of vertical and urban farming and there will also be efforts in long term to find new areas for production like barren deserts and seawater.

5. Precision farming with soil testing-based decisions, automation using artificial intelligence will be focused for precise application inputs in agriculture. Sensors and drones will be used for precision, quality, environment in cost effective manner.

Small and marginal farmers will also be using these technologies with the help of private players, government or farmer producer organisations (FPO). Use of GPS technology, drones, robots etc controlled by smart phones etc can make life of farmers easy and exciting with good results. These advanced devices will make agriculture be more profitable, easy and environmentally friendly.

6. Use nano-technology for enhancement of food quality and safety, efficient use of inputs will be in near future. Nano-materials in agriculture will reduce the wastage in use of chemicals, minimise nutrient losses in fertilisation and will be used to increase yield through pest and nutrient management. IFFCO has already done successful tests in nano-fertilisers.

7. India has improved remarkably in its digital connectivity and market access has become very easy. The number of internet users is projected to reach 666.4 million in 2025. Farmers will be behaving more smartly with mobiles in hands and would be able to be more aware and connected with different stake holders. Government will be making wide use of digital technology for generating awareness among farmers, information sharing, government schemes using digital technology for direct transfers of money.

8. There will certainly be more work by government, village communities, agri startups and private players in conserving sharply depleting water resource. Use of digital technology can make revolution in this direction. There will be use of satellites, IoT, drones for better collection of data regarding soil health,

crop area and yield which will make cost for insurers less with better estimations and system will be more exact and effective.

9. There will be more of niche marketers in operations, area, and crop specific small equipments which will make operations even at small farms easier and efficient.

Food wastage will be less and better use of waste materials in agriculture will be more. Number of warehouses in private sector will be more and linkages between government and private warehouses will be increasing. This will help in balancing supply with demand and stabilisation of prices of agri-outputs in the market.

10. Retailing in agriculture will largely be digitalised. A study estimates that over 90 per cent of kirana stores across the country will be digitalised by 2025 with modern traceable logistics and transparent supply chain. Many players have already taking kiranastores to the door steps of consumers like Amazon and Jio Mart.

Question arises whether farmers will be able to make use of modern technologies in a country where education, holding size, infrastructure, low level of technology adoption and many other constraints are there.

Views expressed are the author's own and don't necessarily reflect those of Down To Earth.