

INDIAN AGRICULTURE ANALYSIS

A Project Report

Submitted by

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23MCA20408

In partial fulfilment for the award of the degree of

Master of Computer Applications



Chandigarh University

November 2024

Project Title: Indian Agriculture Analysis

Introduction: -

India is one of the largest producers of crops like rice, wheat, and pulses, which are staples in the diet of millions of people. Agriculture forms the backbone of the country's economy, providing employment to more than 50% of the population. However, despite the vast land area under cultivation, agricultural productivity often faces numerous challenges. These challenges range from inconsistent rainfall and soil degradation to inefficient farming practices. This project, "Indian Agriculture Analysis," is designed to analyze the patterns and trends in agricultural productivity across Indian states using data visualization and analysis techniques. The focus is on understanding state-wise performance for major crops such as rice, wheat, and pulses.

Problem Statement: -

Indian agriculture is highly diverse, with varying productivity levels across regions. The distribution of crop yield and production is not uniform, and several states underperform compared to others, leading to inefficiencies and food insecurity in certain regions. Policymakers and stakeholders need a data-driven approach to understand these variances and implement solutions to optimize agricultural output.

The key problems addressed in this project include:

- Identifying underperforming states in terms of agricultural production.
- Analyzing the yield per hectare for major crops.
- Understanding the influence of climatic and geographical conditions on crop productivity.
- Recommending strategies for improving yield and production, specifically for low-yield regions
- **Overview:** Briefly introduce Indian agriculture, its significance, and the purpose of the project.
- **Objective:** State the key goals, such as analysing agriculture trends using district-wise and year-wise data for better decision-making.

Objectives

The objectives of this project are:

- To perform a state-wise analysis of the production, area, and yield of major crops such as rice, wheat, and pulses.
- To assess the seasonal variations between **kharif** and **rabi** crops in terms of their area and production.
- To identify top-performing and low-performing states and make recommendations for improvement.
- To provide visual dashboards for clear insights into the data, facilitating quick decision-making for policymakers and stakeholders.

Methodology

The methodology employed for this analysis includes:

1. **DataCollection:**

Data has been collected from various sources, including government databases, agricultural surveys, and research reports. The dataset focuses on major crops across states from 1960 to 2020.

2. **DataCleaning:**

The raw data was cleaned to remove inconsistencies and missing values. Outliers were identified and handled to ensure accurate analysis.

3. **DataAnalysisTools:**

Microsoft Power BI was used to visualize the data for better comprehension. Metrics like total production, area, and yield were calculated for each state and crop type.

4. **VisualizationandDashboardCreation:**

The final visualizations include charts, graphs, and state-wise comparisons of crop performance. The interactive dashboard allows users to filter by state, year, and crop type for an in-depth analysis.

Detailed Analysis of Key Crops

Rice Analysis

Rice is the most cultivated crop in India, accounting for more than 50% of the total agricultural area during the **kharif** season. The following points summarize the key findings for rice:

- **Top Producers:** Uttar Pradesh, West Bengal, and Punjab.
- **Lowest Producers:** Himachal Pradesh, Uttarakhand, and Kerala.
- **Trends Over Time:** Rice production has steadily increased since 1960, with fluctuations caused by climatic conditions and changing farming practices.
- **Yield Comparison:** Uttar Pradesh and West Bengal have the highest rice yield per hectare, while states like Bihar and Orissa lag behind.

Wheat Analysis

Wheat is primarily grown during the **rabi** season and is a major staple in northern India. Here's a detailed analysis:

- **Top Producers:** Uttar Pradesh, Punjab, and Madhya Pradesh.
- **Lowest Producers:** Kerala and Assam.
- **Production Trends:** Wheat production has seen significant growth since 1980, driven by technological advancements and the introduction of highyielding varieties.
- **Yield Comparison:** Punjab consistently shows the highest yield, thanks to advanced irrigation techniques and government subsidies.

Pulses Analysis

Pulses are a crucial source of protein in the Indian diet. However, their production is relatively low compared to rice and wheat.

- **Top Producers:** Madhya Pradesh, Uttar Pradesh, and Rajasthan.
- **Lowest Producers:** Kerala and Jharkhand.

- **Trends Over Time:** While pulses' production has increased, it hasn't kept pace with the growing demand.
- **Yield Comparison:** Rajasthan and Madhya Pradesh lead in yield, while Kerala and Assam have the lowest production.
- Acknowledge that data from 20 states and 311 districts over 52 years was used. Mention the main crops analyzed (rice, wheat, maize, pulses, etc.).

Major Crops Analysis

- Summarize trends in area, production, and yield.
- Highlight findings like Uttar Pradesh, Madhya Pradesh, and Rajasthan leading in yield.
- Discuss the differences between states with major crop production and those with lower yields.

State Analysis

- Focus on the variations in crop production across states.
- Discuss the reasons behind discrepancies in production, such as weather, farming practices, and post-harvest challenges.
- Explain the distinctions between Kharif and Rabi crops in terms of cultivation period, area, and production trends.
- Discuss the dominance of rice and sugarcane in Kharif crops and wheat in Rabi crops.
- Add any specific insights about production trends in each season.

State-Wise Crop Distribution and Insights

Uttar Pradesh:

The state leads in rice and wheat production but has lower productivity for pulses. There is potential for improvement in pulse cultivation through better farming techniques.

WestBengal:

This state excels in rice production but could enhance wheat and pulse yield by adopting more effective agricultural practices.

MadhyaPradesh:

A significant producer of wheat and pulses, Madhya Pradesh shows promise but faces challenges in rice production due to arid conditions in some areas.

Punjab:

Punjab stands out as the highest wheat producer, with robust agricultural infrastructure. However, soil degradation due to excessive wheat-rice cycles poses a long-term challenge.

Seasonal Analysis

Kharif Crops

Kharif crops are sown with the onset of the monsoon season. Key findings include:

- **Rice** dominates the **kharif** season, accounting for 51.51% of production.
- **Maize** and **pearl millet** are the next most produced crops.
- **Regional Trends:** Uttar Pradesh and West Bengal lead in **kharif** crop production, while regions like Rajasthan focus on maize and pulses.

Rabi Crops

Rabi crops are sown after the monsoon rains. Notable insights:

- **Wheat** is the dominant **rabi** crop, with over 78.17% of the total rabi production.
- **Chickpeas** and **barley** also feature significantly in the **rabi** season, with Madhya Pradesh excelling in chickpea production.

Recommendations

Based on the analysis, the following recommendations are made:

- **Improving Irrigation Infrastructure:** In states like Bihar and Orissa, better irrigation systems can significantly improve rice yields.
- **Adopting Advanced Agricultural Techniques:** States with lower yields, such as Jharkhand and Assam, should focus on modern farming practices, including the use of high-yield seeds and better pest management.
- **Soil Health Initiatives:** Punjab and Haryana should implement strategies to maintain soil health, as excessive mono-cropping of wheat and rice is depleting the soil's nutrients.

Conclusion

The Indian agriculture sector is vast and diverse, with significant potential for growth. While states like Uttar Pradesh and Punjab perform exceptionally well in terms of production, other regions struggle due to various challenges. Through data-driven analysis, this project aims to provide insights that can guide future agricultural policies and interventions. Improving crop yield in underperforming states and addressing resource constraints will be crucial for ensuring food security and the long-term sustainability of Indian agriculture.

DASHBOARD: -

Indian Agriculture Analysis

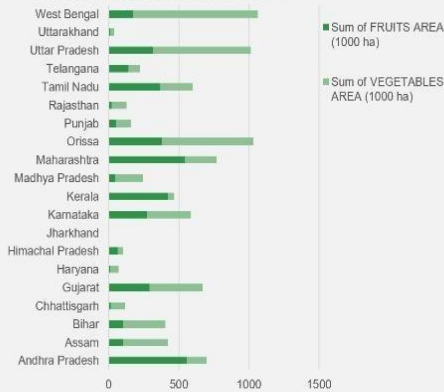
major crop

state analysis

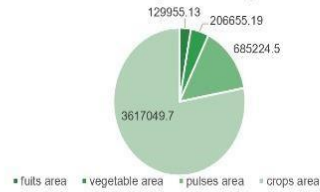
seasonal analysis

fruit and vege...

fruit and vegetable area by state



Area Distribution: Crops vs. Fruits/Vegetables



Year

1966

1967

1968

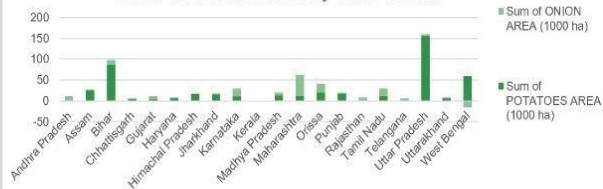
1969

1970

1971

1972

Onion VS Potatoes Area By State 1000ha



Year

2002

2003

2004

2005

2006

2007

2008

Indian Agriculture Analysis

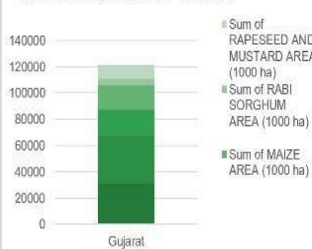
major crops

state analysis

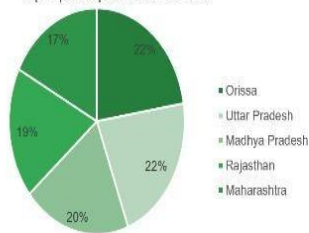
seasonal analysis

fruits and vege...

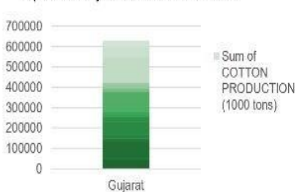
top 5 state by crop area 1000(ha)



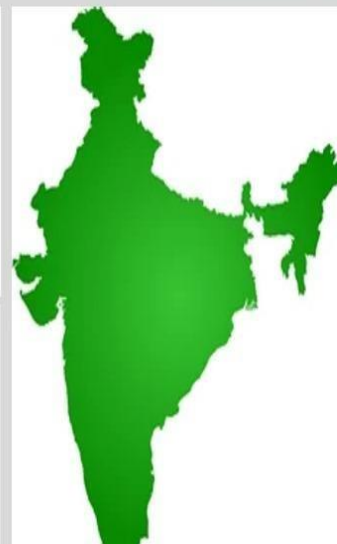
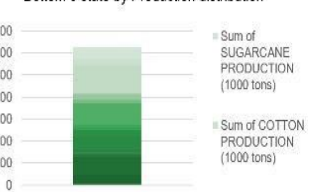
top 5 pulse production states



Top 5 state by Production distribution



Bottom 5 state by Production distribution



State Name

Andhra Pradesh

Assam

Bihar

Chhattisgarh

Year

1970

1971

1972

1973

Year

1966

1967

1968

1969

Indian Agriculture Analysis

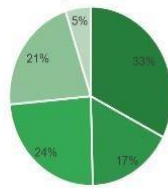
major crop

state analysis

seasonal analysis

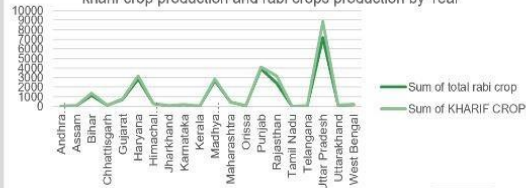
fruit and vege....

kharif crops Production distribution



■ Andhra Pradesh
■ Assam
■ Bihar
■ Chhattisgarh
■ Gujarat

kharif crop production and rabi crops production by Year



Year

1966

1967

1968

Year

1994

1995

....

Year

1966

1967

1968

Year

1966

1967

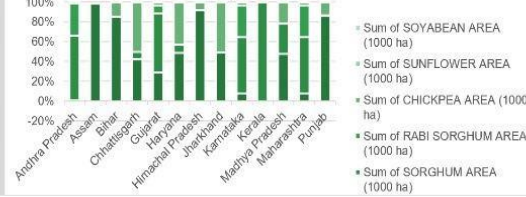
1968

Sum of WHEAT PRODUCTION (1000 tons)



■ Andhra Pradesh
■ Assam
■ Bihar
■ Chhattisgarh
■ Gujarat
■ Haryana
■ Himachal Pradesh
■ Jharkhand

Rabi crops Area distribution



Indian Agriculture Analysis

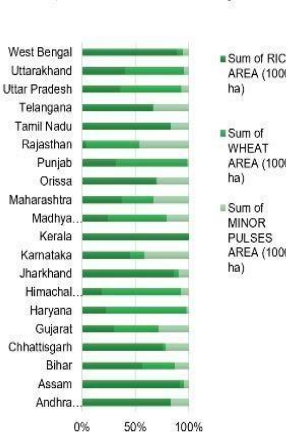
major crops

state analysis

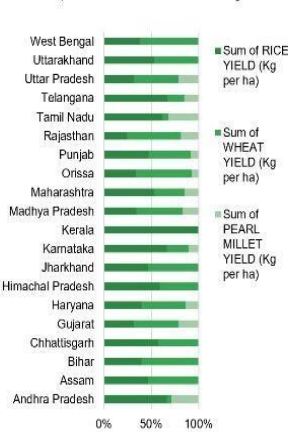
seasonal analysis

fruit and vege..

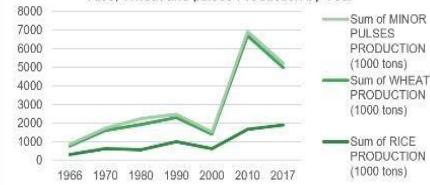
Rice, Wheat and Pulses Area by State



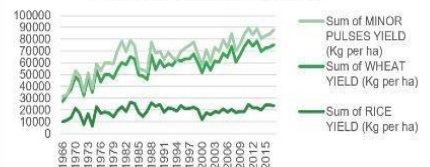
Rice, Wheat and Pulses Yield by State



Rice, Wheat and pulses Production by Year



Rice, Wheat and Pulses Yield by Year



State Name

Andhra Pradesh

Assam

Bihar

Chhattisgarh

Gujarat

Haryana

Himachal Pradesh

Year

1979

1980

1981

1982

1983

1984

1985

GitHub link :-

<https://github.com/rupali0508/BA-project>