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Analyses of the Jowar and Bajra Production, Yield and Area Data Using Pivot Table.

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ABSTRACT –
The aim of this study is to analyze the production, yield, and area of jowar and bajra crops in Maharashtra using big data analysis techniques such as pivot tables and dashboards. Understanding the production trends of jowar and bajra, two significant cereal crops in Maharashtra can help farmers, decision-makers, and researchers. conducted this analysis, a large dataset containing information on jowar and bajra production, yield, and area from multiple years is collected. The dataset includes variables such as district-wise production, yield per hectare, and cultivated area for both crops.
First, a pivot table is made to compile the information and gave a general overview of the jowar and bajra production, yield, and area in each district of Maharashtra. This pivot table made it simple to compare and find trends across various districts and years. The results are presented in an interactive dashboard that is created using data-visualized techniques. Various graphs and charts that show the production, yield, and area trends over time are included in the dashboard. Users filtered the data based on their preferred years or geographic regions. The analysis of the pivot table and dashboard reveals important insights into the jowar and bajra production landscape in Maharashtra. It highlighted the districts with the highest rice production in Kolhapur and highest bajra production in Sangli, identified any significant changes in yield over time, and provides an understanding of the areas where these crops are predominantly cultivated.
Keywords – Data analysis, Jowar, Bajra, Dashboard.

I. INTRODUCTION –

'Big Data' is defined in terms of many V's but with emphasis on 5Vs — Volume, Velocity, Variety (types such as structured, unstructured, text, voice, video, etc.); Value (worth of data in terms of relevance) and Veracity (quality or trustworthiness of data). (7)

The term agricultural "big data" helps to realize the necessity of considerable investments in infrastructures for the storage and processing of agricultural data. Big data promises precision data storage, processing and analysis that was not possible before with traditional methods. It enables search, aggregating and relating different agricultural data to get optimum conclusions in farming. Relating factor such as data with the statistical data (previous yields) supports the decisions such as crop recommendations, yield prediction, fertilizer recommendation, pest management, forecasting prices, and policy recommendation.(6)

Big data refers to a vast and intricate collection of data.It becomes challenging to process big data using conventional database management tools or traditional methods of data processing. Big Data is characterized by four components: (a) volume (how big the data), (b) velocity (how the data is being collected), (c) variety (how variedthe data being collected is) and (d) Veracity (big data solutions must validate the accuracy of the bulky amount of data). To effectively manage the storage and analysis of large amounts of data, a change in computing architecture is essential for users to handle big data economically.(11)

To efficiently handle and analyze the vast quantities of data produced by agricultural departments, users must adopt a distinct computing framework. This is vital for the cost-effective management and examination of the enormous

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amounts of data generated daily, which totals an astonishing 2.5 quintillion bytes globally.(2)

II. REVIEW OF LITERATURE –

"Big Data Analytics in Agriculture: A Review" by A. K. Mishra et al. (2019) While this review article does not specifically focus on pivot tables, it provides an overview of various big data analytics techniques used in agriculture. It discusses the challenges and opportunities associated with big data analysis in agriculture and highlights the importance of using appropriate tools and techniques, such as pivot tables, to extract meaningful insights from agricultural data.

"Data Analysis Using Pivot Tables in Agriculture" by M. H. Ali et al. (2018) This study focuses on the application of pivot tables in analyzing agricultural data. It provides a step-by-step guide on how to use pivot tables to summarize and analyze large datasets in agriculture. The authors highlight the benefits of pivot tables, such as their ability to quickly generate reports and identify trends or patterns in the data.

"Application of Pivot Tables in Agricultural Research" by S. K. Mishra et al. (2017) This article discusses the use of pivot tables in agricultural research. It provides examples of how pivot tables can be used to summarize and analyze agricultural data, such as crop yield data, soil nutrient levels, and weather patterns. The authors emphasize the ease of use and flexibility of pivot tables in handling large datasets.

"Using Pivot Tables for Data Analysis in Precision Agriculture" by J. L. Hatfield et al. (2015) This paper explores the application of pivot tables in precision agriculture. It discusses how pivot tables can be used to analyze data collected from various precision agriculture technologies, such as yield monitors, soil sensors, and satellite imagery. The authors highlight the importance of using pivot tables to summarize and visualize complex agricultural data.

III. MATERIAL AND METHODOLOGY –

1. Data Collection: Gathered necessary information on jowar and bajra from different sources, such as the Directorate of Economics and Statistics, Department of Agriculture and Farmers Welfare, Ministry of Agriculture and Farmers Welfare, Government of India. The data included details about the area, production, and yield of jowar and bajra in Maharashtra from 2000 to 2021, with a specific focus on the Konkan region.
2. Data Cleaning and Preparation: Cleaned the collected data by removing any duplicates, errors, or outliers. Transformed the data into a format suitable for pivot table analysis, such as organizing it in a tabular form with rows of repressed observations and columns of repressed variables.
3. Pivot Table Creation: Imported the cleaned and prepared data into spreadsheet software that supports pivot table functionality, such as Microsoft Excel. Created a pivot table by selecting the relevant data range and choosing the appropriate variables for rows, columns, and values.
4. Data Summarization: Used the pivot table to summarize the agricultural data of jowar and bajra by calculating various summary statistics, such as means, sums, counts, or percentages. This step helped to gain a quick overview of the data and identify any patterns or trends.
5. Data Analysis: Utilized pivot table featured to examine the compiled data, enabling the exploration and comparison of various subsets of the information. This analysis was involve filtering, sorting, or grouping to gain further insights.
6. Data Visualization: Created visual representations of the analyzed data using pivot table tools, such as charts or graphs. This step helped to communicate the findings effectively and facilitated decision-making in agriculture.
7. Interpretation and Insights: Interpreted the results obtained from the pivot table analyzed and derived meaningful insights. These insightsinformedagricultural practices, such as crop management strategies, resource allocation, or risk assessment.
8.Create a Dashboard: at the last created a dashboard for easy to understand when, where and in how much quantity yield, area and production is increased or decreased with a respective year in respective crops.

IV. RESULTS AND DISCUSSION –

1. Data Collection: Gathered necessary information on jowar and bajra from different sources, such as the Directorate of Economics and Statistics, Department of Agriculture and Farmers Welfare, Ministry of Agriculture and Farmers Welfare, Government of India. The data included details about the area, production, and yield of jowar and bajra in Maharashtra from 2000 to 2021, with a specific focus on the Konkan region.
2. Yield Analysis: The pivot tables and dashboards was used to analyze the yield data collected from the Directorate of Economics and

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Statistics,Department of Agriculture and Farmers Welfare, Ministry of Agriculture and Farmers Welfare, Govt. of India. The analyzed was provided insights into the factors that affect yield, production and area of jowar and bajra. The discussionfocused on identifying the yield variability and suggested strategies to optimize yield and crop sectioned.

3. Resource Allocation: After analyzing data on resource inputs, the pivot tables and dashboards were helped optimized resourced allocation in agriculture. The results highlightedareas of Production are high and low in Maharashtra.

4. Risk Assessment: The analysis identified high-risk areas where production is very less due to high rainfall.

5. Crop Management: After analyzing data on crop Production, Yield and Area of Jowar and Bajra. The pivot tables and dashboards provided insights into optimal crop management practices. The results were guide decisions on planting dates, pest control measures, or nutrient application rates.

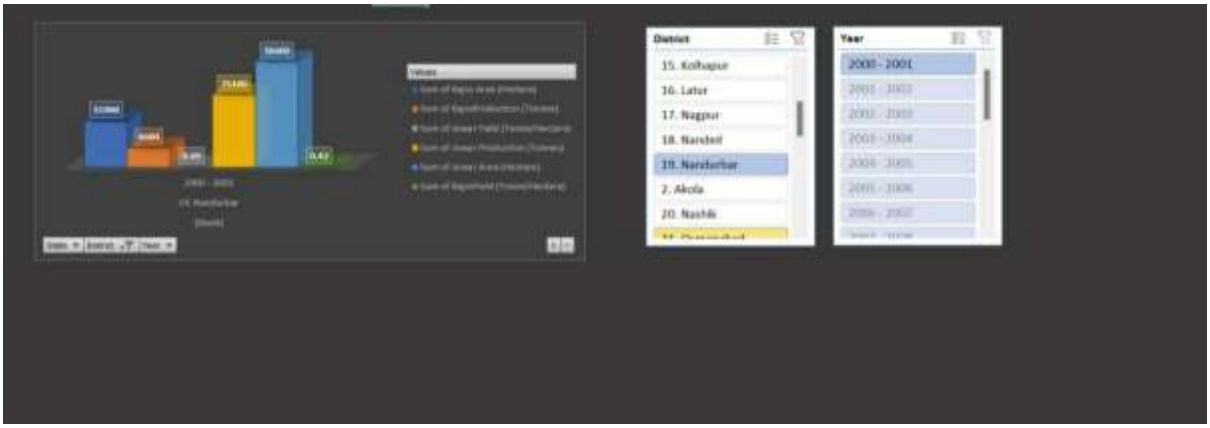

Figure 1 – Dashboard of Jowar and Bajra Area, Production, Yield of Various Districtof Maharashtra (2000 - 2021)

V. CONCLUSION –

The study concluded thatbig data analysis using pivot tables and dashboards in agriculture can provide valuable recommendations for various aspects of crop selection in various districts of Maharashtra. After analyzing all jowar and bajra crop data back 21 years, the dashboard and pivot table is importantto help farmers make decisions to improve productivity, sustainability, and profitability of crops in different districts of Maharashtra.

When two crops jowar and bajra were studied for the entire Maharashtra, it was noticed that the production and cultivation area of jowar and bajra was observed in many districts.

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