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Analyses of the Tur and Groundnut Production, Yield and Area Data Using Pivot Table.

A.M. Kutwal[1],P. R. Kolhe[2], V.D. Jadhav[3],A.A. Kale[4], S.B. Gavit[4]M.M.Khatal[4]
[1]*M.Tech, College of Agricultural Engineering and Technology, Dr. BSKKV, Dapoli Maharashtra, India*
[2]*Associate Professor (CAS), College of Agriculture Engineering and Technology, Dr. BSKKV, Dapoli Maharashtra, India*
[3]*Technical Assistant AKMU, Dr. BSKKV, Dapoli Maharashtra, India*
[4]*M.Tech, College of Agriculture Engineering and Technology, Dr. BSKKV, Dapoli*

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ABSTRACT –
The aim of this study is to analyze the production, yield, and area of Groundnut and Tur crops in Maharashtra using big data analysis techniques such as pivot tables and dashboards. Groundnut and Tur are two important cereal crops in Maharashtra, and understanding their production trends can provide valuable insights for farmers, policymakers, and researchers. To conduct this analysis, a large dataset containing information on Groundnut and Tur 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 created to summarize the data and provide an overview of the production, yield, and area for Groundnut and Tur in each district of Maharashtra. This pivot table allows for easy comparison and identification of trends across different districts and years. Next, a dashboard is developed using data visualization techniques to present the findings in a user-friendly and interactive manner. The dashboard includes various charts and graphs that illustrate the production, yield, and area trends over time. It also allows users to filter the data based on specific districts or years of interest.

The analysis of the pivot table and dashboard reveals important insights into the Groundnut and Tur production landscape in Maharashtra. It highlights the districts with the highest Tur production in Latur and highest Groundnut production in Dhule, Jalgaon, Satara and lowest production of Groundnut in Thane and lowest production of Tur in Palghar, identifies any significant changes in yield over time, and provides an understanding of the areas where these crops are predominantly cultivated.

Key word – Data analysis, Groundnut, Tur, Dashboard.

I. INTRODUCTION –

'Big Data' is defined in terms of many V's but with emphasis on 5Vs — Volume (size in terabytes/petabytes); Velocity (flow or data in motion); 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 storage and processing of agricultural data. Big data promises precision data storage, processing and analyzing that was not possible before with traditional methods. It enables search, aggregating, relating different agricultural data to get optimum conclusion 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 Turs, and policy recommendation.(6)

Big data is collection of large and complex data set. which becomes difficult to processing using on-hand database management tools or traditional data processing techniques. Big Data characterized by four components: (a) volume (how big the data), (b) velocity (how the data is being collected), (c) variety (how variety data being collected is) and (d) Veracity (big data solutions must validate the accuracy of the bulky amount of data). Big data requires a shift in computing architecture so that users can handle both the data storage and analyzing large volumes of data economically. (11)

Big data refers to the ability to collect and analyze the huge amounts of data that is being generated by different departments working directly or indirectly involved in agriculture. Every

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day the World generates 2.5quintillion bytes of data.(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: Collect relevant Groundnut and Tur data from various sources as a Directorate of Economics and Statistics , Department of Agriculture and Farmers Welfare , Ministry of Agriculture and Farmers Welfare, Govt. of India. A data is related to area , production and yield of Tur and Groundnut (finger millet) in during year of 2000 – 2021 of Maharashtra as well as a specially a Konkan region for analysis.
2. Data Cleaning and Preparation: Clean the collected data by removing any duplicates, errors, or outliers. Transform the data into a format suitable for pivot table analysis, such as organizing it in a tabular form with rows representing observations and columns representing variables.
3. Pivot Table Creation: Import the cleaned and prepared data into a spreadsheet software that supports pivot table functionality, such as Microsoft Excel . Create a pivot table by selecting the relevant data range and choosing the appropriate variables for rows, columns, and values.
4. Data Summarization: Use the pivot table to summarize the agricultural data of Tur and Groundnut by calculating various summary statistics, such as means, sums, counts, or percentages. This step helps to gain a quick overview of the data and identify any patterns or trends.
5. Data Analysis: Analyze the summarized data using pivot table functionalities, such as filtering, sorting, or grouping. This allows for further exploration and comparison of different subsets of the data.
6. Data Visualization: Create visual representations of the analyzed data using pivot table tools, such as charts or graphs. This step helps to communicate the findings effectively and facilitates decision-making in agriculture.
7. Interpretation and Insights: Interpret the results obtained from the pivot table analysis and derive meaningful insights. These insights can inform agricultural 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 increase or decrease with respective year in respective crops.

IV. RESULTS AND DISCUSSION –

1. Data Collection: Collected relevant Groundnut and Tur data from various sources as a Directorate of Economics and Statistics , Department of Agriculture and Farmers Welfare , Ministry of Agriculture and Farmers Welfare, Govt. of India. A data is related to area , production and yield of Tur and Groundnut (finger millet) in during year of 2000 – 2021 of Maharashtra as well as a specially a Konkan region for analysis.
2. Yield Analysis: The pivot tables and dashboards can be used to analyze the yield data collected from Directorate of Economics and Statistics

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,Department of Agriculture and Farmers Welfare , Ministry of Agriculture and Farmers Welfare, Govt. of India. The analysis can provide insights into the factors that affect yield, production and

2. Resource Allocation: After analyzed data on resource inputs, the pivot tables and dashboards were help optimize resource allocation in agriculture. The results highlighted areas of Production is high and low in Maharashtra.

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

area of Groundnut and Tur. The discussion can focus on identifying the yield variability and suggested strategies to optimize yield and crop selection.

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

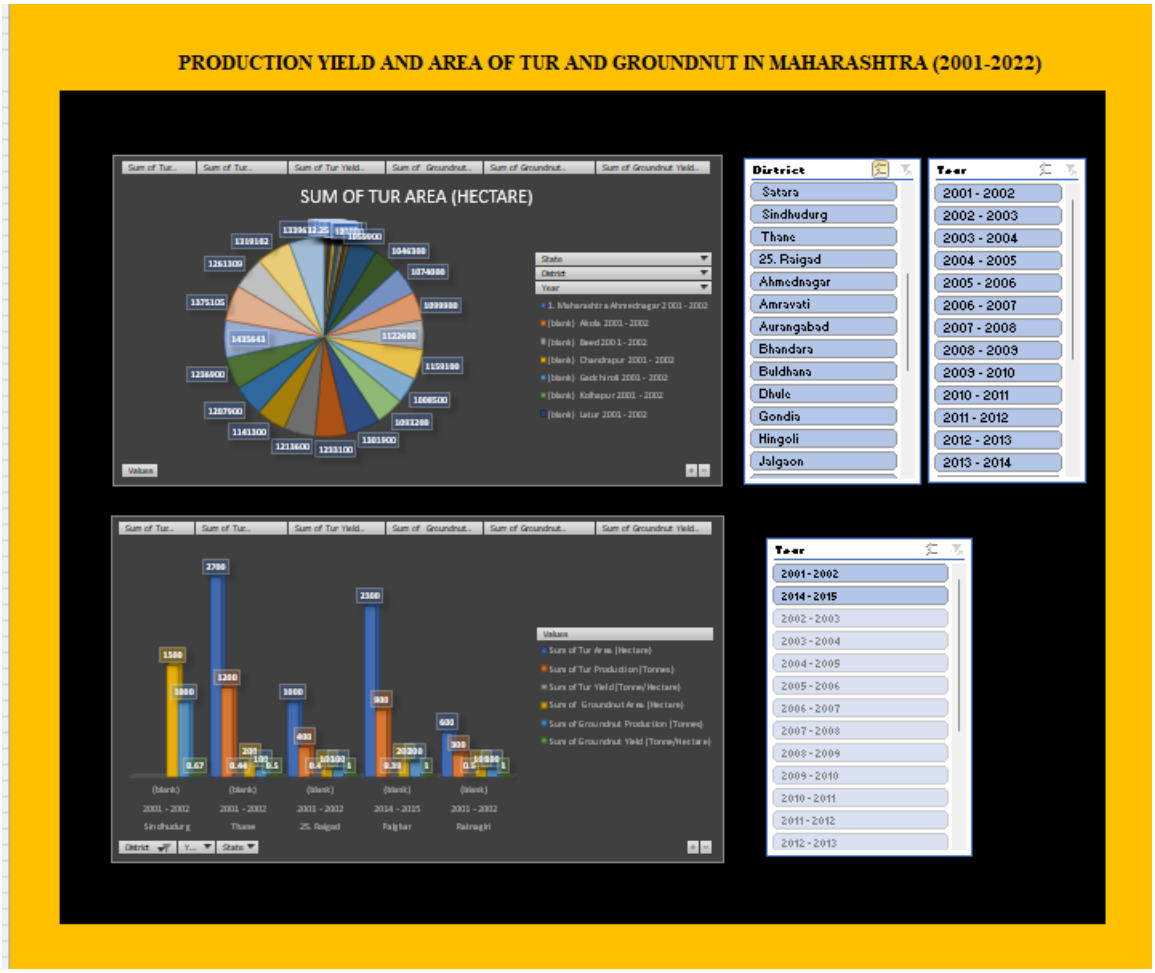

Figure 1 – Dashboard of Tur and Groundnut Area, Production, Yield of Various District and Konkan Region of Maharashtra (2000 - 2021)

V. CONCLUSION –

The study is concluded that big data analysis using pivot tables and dashboards in agriculture can provided valuable recommendations for various aspects of crop selection in various districts of Maharashtra. After analyzing all Groundnut and Tur crop data of back 21 years, dashboard and pivot table are important to help farmers make decisions to improve productivity, sustainability, and profitability of crop in different district of the Maharashtra.

When two crops Groundnut and Tur were studied for entire Maharashtra, it was noticed that the production and cultivation area of tur and

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Groundnut was observed in many districts. But at the same time, in Konkan region i.e., districts Palghar, Thane, Ratnagiri, Raigad, Sindhudurg, this quantity is low and its production is also low.

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