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# An economics analysis of green chili cultivation: A case study of Kurugodu Taluk

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**Abstract**

This study emphasizes the green chill production in Karnataka, green chili is the major spicy product in the food products. In this study, we calculated trends and patterns of the green chili because of to know the price production performance in Karnataka from 2013 to 2022. Karnataka is the top fourth state in green chili production after Andhra Pradesh, Telangana, and Madhya Pradesh. Also, this study focused on cost and profitability to know the cost and production comparison. Medium-sized farmers are enjoying profitability, and small farmers are getting average profits to compare medium farmers. Finally, the government needs to facilitate cold storage, the availability of chemical fertilizer, and financial assistance subsidies to green chili growers.

**Keywords:** Cost cultivation. green chili. Karnataka

## Introduction

This study on a thorough how-to for growing green chilies, or *Capsicum annuum*, a crop that is very valuable in India. The study highlights the transplanting technique for seedbeds and provides ideal sowing times. The seed rates for both hybrid and conventional kinds are noteworthy, and details about the harvesting procedure-which entails several pickings spread over a ninety-day period-are provided. This article examines the background of the Portuguese introduction of chili farming in India during the 17$^{th}$ century. The main ingredient, capsaicin, is well-known for its therapeutic qualities, which include pain management and anti-cancer actions. It also has the added benefit of avoiding heart disease by widening blood arteries. The importance of producing chilies worldwide are examined, with India leading the way and China and Pakistan following. Additionally, the article lists the principal growing regions for chilies across the globe. Extensive information is available on preferred soil types and irrigation techniques, with a focus on the value of fertile, well-drained loam and suitable pH levels. For efficient water management, the crucial phases of fruit growth and flowering are underlined. With an emphasis on historical, medicinal, and global views, this extensive abstract seeks to be a useful tool for agricultural practitioners, academics, and policymakers by providing insights into optimizing the productivity of green chilies.

## Objectives

1. To study on trends and patterns in price of Green Chili.
2. Cost and profitability analysis of the production on Green Chili in study area.

## Materials and Methods

The study, which is limited to the state of Karnataka, are based on both primary data from surveys that were filled out and secondary data from Krishimatravani that was acquired from the APMC website and covers the period from 2013 to 2022 for all markets in Karnataka. Departments of agriculture, horticulture, and other sources provide secondary data. I employed trend and pattern and descriptive statistics and charts and tables. This method might involve calculating year-to-year growth rates to identify significant changes in green chili production during the study periods. The second objective is primary data, which was collected by direct interview.

## Data source

This study has two objectives. The first objective is based on secondary data; this data is collected from green chilly

production data in Karnataka from 2013 to 2022 collected through the Krishimatravani that was acquired from the APMC website. The second objective is primary data. This data was collected directly from the green chili production farmers of Badanhatti, Somasammudra, and vaddhatti villages of Kurugodu taluk, Bellary district.

**Sample techniques**

On the basis of the nature study, I have taken 50 sample sizes of the total population in the Ballari district. In this district, I selected 3 villages: Badanhatti, Somasammudra, and Vaddhatti we considered these villages on the basis of simple random sampling techniques.

**Results and Discussion**

To perform a trend and pattern analysis of Green Chili production in Karnataka over the years 2013 to 2022, we can use statistical methods. Here's how you can analyze the data.

**Table 1:** The growth rate of Green Chili Production and Price in Karnataka from 2013 to 2022

| Month | Total Quantity | Total Price | Average of Price | Average of Quantity |
|---|---|---|---|---|
| January | 220616 | 549815212 | 99966402.18 | 40112 |
| February | 176588 | 307310047 | 55874554 | 32106.90909 |
| March | 181061 | 328475090 | 59722743.64 | 32920.18182 |
| April | 177704 | 344530164 | 62641848 | 32309.81818 |
| May | 223091 | 444693044 | 80853280.73 | 40562 |
| June | 227664 | 465824247 | 84695317.64 | 41393.45455 |
| July | 232932 | 506352892 | 92064162.18 | 42351.27273 |
| August | 196171 | 386110549 | 70201918 | 35667.45455 |
| September | 186307 | 292713229 | 53220587.09 | 33874 |
| October | 182850 | 274194355 | 49853519.09 | 33245.45455 |
| November | 178701 | 307077751 | 55832318.36 | 32491.09091 |
| December | 182823 | 359032981 | 65278723.82 | 33240.54545 |

***Sources*:** Author Calculation

The table contains data related to quantities, prices, and various statistical measures. Total Quantity and Total Price. Total Quantity: The sum of all quantities in the table is 2,307,206. Total Price: The sum of all prices in the table is 4,990,848,336.Average of Price: The average price is approximately 90,577,918.19 (Total Price / Number of Rows). Average Quantity: The average quantity is approximately 41,728.67 (Total Quantity / Number of Rows). Median of Quantity: The median quantity is 18,222.5, which means that half of the quantities are above this value, and half are below. Median of Price: The median price is 33,243,650, which is the middle value when all prices are sorted in ascending order. The standard deviation of Quantity is approximately 15,556.11. This measures the amount of variation or dispersion in the quantities. The standard deviation of Price is approximately 13,767,911.38. This measures the amount of variation or dispersion in the prices.

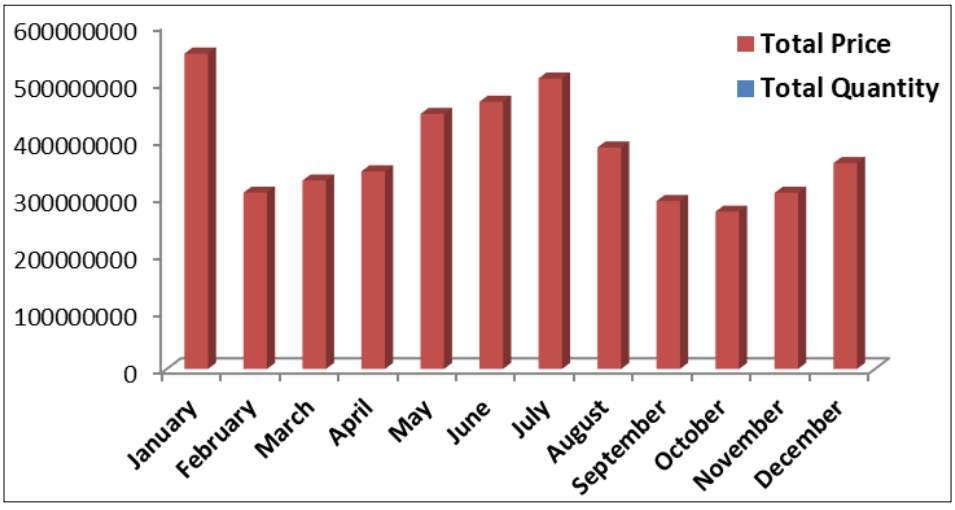


**Fig 1:** Green chili production and Price in Karnataka from 2013 to 2022

Overall Trend: The Total Quantity and Total Price seem to fluctuate throughout the year. It would be helpful to visualize this data using charts to identify any patterns or trends. Quantity Analysis: The highest quantity was recorded in July, with 232,932 units, while the lowest was in February, with 176,588 units. There is a noticeable increase in quantity from January to July, with a subsequent decrease in the following months. Price Analysis: The highest total price was in July, with 506,352,892 units, while the lowest was in October, with 274,194,355 units. Similar to the quantity trend, there is an increase in total price from January to July, followed by a decrease in the subsequent months.

**Table 2:** Determine the costs and profitability of producing green chilies

| | *Coefficients* | Standard Error | t-Stat | P-value |
|---|---|---|---|---|
| Intercept | 4.530137 | 5.77132 | 0.78494 | 0.437114 |
| Price per quintal | -0.41383 | 0.265893 | -1.55636 | 0.127499 |
| Gross return per acer | 2.763421 | 0.570121 | 4.847081 | 1.93E-05 |
| Net return per acre | -1.79114 | 0.581254 | -3.08151 | 0.003719 |
| Cost of seed per acre | -1.37749 | 0.437194 | -3.15074 | 0.00308 |
| Land preparation cost for green chili per acre | 0.01871 | 0.21449 | 0.08723 | 0.930924 |
| Bullock labor cost per acre | 0.111717 | 0.274488 | 0.407 | 0.686178 |
| Human Labor cost per acre | 0 | 0 | 65535 | #NUM! |
| Transportation Cost per acre | -0.00895 | 0.181463 | -0.04934 | #NUM! |
| Cost of plant protection charges per acre | 0.028614 | 0.09734 | 0.29396 | 0.770309 |
| Fertilizer cost per acre | 0.137464 | 0.184673 | 0.744366 | 0.461006 |

**Regression Statistics**

| | |
|---|---|
| Multiple R | 0.941546648 |
| R Square | 0.88651009 |
| Adjusted R Square | 0.83597486 |
| Standard Error | 0.157808081 |
| Observations | 50 |

***Sources*:** Author Calculation

**Variables Y= X1 X 2 X3 X4 X5 X6 X7 X8 X9 X10**

Y= Output(q) per acre
X1= Price per quintal
X2= Gross return per acer
X3= Net return per acre
X4= Cost of seed per acre,
X5= Land preparation cost for green chili per acre
X6= Bullocks labor cost per acre
X7= Human Labor cost per acre
X8=Transportation Cost per acre
X9= Cost of plant protection charges per acre
X10= Fertilizer cost per acre

The table and figure contain data related to Coefficients. Table: Intercept: The intercept is 4.530137, but it is not statistically significant (p-value = 0.437114), suggesting that the intercept may not significantly differ from zero. Price per quintal: The coefficient is -0.41383, and it is not statistically significant (p-value = 0.127499). The negative coefficient suggests a negative relationship, but its significance is not established. Gross return per acre: This variable has a significant positive impact (p-value = 1.93E-05), indicating that as gross return per acre increases, the dependent variable is expected to increase. Net return per acre: The negative coefficient (-1.79114) is statistically significant (p-value = 0.003719), implying a negative relationship between net return per acre and the dependent variable. Cost of seed per acre: The negative coefficient is statistically significant (p-value = 0.00308), indicating a negative relationship with the dependent variable. Land preparation cost, Bullocks labor cost, and Fertilizer cost: None of these coefficients appear statistically significant at a conventional significance level (p-values > 0.05). Human labor cost: It seems there might be an issue with this variable. The coefficient is given as zero, and the t-stat and p-value are not sensible.

**Regression statistics**

Multiple R: This is the correlation coefficient between the observed and predicted values. In this case, it's 0.9415, suggesting a strong positive linear relationship. R Square: This is the coefficient of determination, indicating the proportion of the variance in the dependent variable that is predictable from the independent variables. A value of 0.8865 indicates a high level of explanation in the variation. Adjusted R Square: This adjusts the R Square for the number of predictors. It's slightly lower than R Square but still high at 0.8359. Standard Error: This is the standard deviation of the residuals (the differences between observed and predicted values). A low value (0.1578) suggests a good fit. Observations: There are 50 observations in the dataset.

**Issues and considerations**

The p-values are crucial in interpreting the significance of coefficients. Variables with high p-values may not be contributing significantly to the model. It seems there are issues with some variables, particularly the "Human Labor cost" and "Transportation Cost per acre," where the t-stat and p-value are not sensible.

**Recommendations**

1. Further investigate the variables with non-sensible values.
2. Consider removing non-significant variables to simplify the model if supported by domain knowledge or statistical tests.
3. Validate assumptions of regression, such as normality and independence of residuals.

**Conclusion**

It is understood that the rural green chili farmers are economically very weak and are mostly illiterate and traditional, and also face problems of market, diseases, and finances. Although the government has implemented many programs to develop agriculture, agriculture is still underdeveloped. Because India is a highly rural area where the livelihood of the people is agriculture, the rural areas are mostly dependent on green chili cultivation. They are facing major financial problems, and being illiterate is the main reason. A large number of people depend on rain-fed agriculture, which does not fall equally everywhere, so this means that monsoon rains are a gamble with agriculture. This problem is a major problem for green chili farmers.

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