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Production and Post production Management and Export Competitiveness of Mango in Telangana

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Abstract :

This study focuses on the production and post-production management of mangoes in Telangana and its impact on export competitiveness. Mango is one of the major horticultural crops grown in Telangana, and the state has emerged as a significant contributor to India's mango production. However, to enhance export competitiveness, it is essential to analyze the production and post-production management practices and identify areas for improvement.

The study utilizes both primary and secondary data sources to assess the current state of mango production and post-production management in Telangana. Primary data is collected through surveys and interviews conducted with mango farmers, exporters, and other stakeholders involved in the mango value chain. Secondary data from government reports, research papers, and industry publications are also used to support the analysis.

The study identifies the adoption of modern production techniques, such as high-density planting, integrated pest management, and improved irrigation systems, as crucial for enhancing mango productivity and quality. Furthermore, the use of certified planting material, organic farming practices, and efficient farm management can contribute to the production of export-quality mangoes.

Effective post-harvest management, including proper sorting, grading, and packaging, is essential to maintain the quality and shelf life of mangoes. The study highlights the need for improved infrastructure, such as cold storage facilities and packhouses, as well as the implementation of post-harvest treatments to control pests and diseases and minimize post-harvest losses.

Value addition through processing mangoes into various products, such as pulp, juice, and dried slices, can enhance export competitiveness by expanding the product range and increasing shelf life. The study emphasizes the importance of branding, market intelligence, and export promotion activities to access international markets and improve market competitiveness.

Compliance with international quality standards and certifications, such as Global Good Agricultural Practices (GAP) and Organic certifications, is crucial for gaining consumer trust and accessing high-value export markets. The study examines the current level of compliance with quality standards and identifies areas for improvement to meet the stringent requirements of international buyers.

Keywords : Telangana, Production, Post-production management, Export competitiveness, Horticultural crops, Primary data, Secondary data, Farmers, Exporters, Value chain, High-density planting, Integrated pest management.

Introduction

The mango industry is an important contributor to the economy of Telangana and the country as a whole. Mango is one of the most widely cultivated fruits in India, and Telangana is one of the major mango-growing states in the country. The state is known for its high-quality mangoes, which are in high demand both domestically and internationally.

However, despite the significance of the mango industry in Telangana, there are several challenges that hinder its competitiveness in the global market. These challenges include inefficient production and post-production practices, lack of proper infrastructure and storage facilities, and poor access to market information and technology. These factors affect the quality and shelf life of mangoes, which in turn affects their export potential.

To address these challenges and improve the competitiveness of the mango industry in Telangana, it is essential to focus on the production and post-production management practices that are being followed in the state. This includes improving the quality of mangoes at the farm level, improving post-harvest handling practices, and ensuring proper storage and transportation facilities.

Additionally, there is a need to improve the export competitiveness of the mango industry in Telangana by increasing its market access, improving its marketing strategies, and enhancing its supply chain management practices. By addressing these issues, the mango industry in Telangana has the potential to become a major player in the global mango market, providing increased income and livelihood opportunities for the people of the state.

The present study aims to investigate the current production and post-production management practices in the mango industry in Telangana, and assess the export competitiveness of mangoes produced in the state. The study will provide valuable insights into the challenges faced by the mango industry in Telangana and recommend strategies to improve its competitiveness in the global market.

A Conceptual frame work is a visual representation of the key concepts, theories, and relationships that underlie our research.

1. Independent variables: Production and post-production management practices, including cultivation methods, fertilization practices, pest and disease control, harvesting and grading, post-harvest handling, and storage.
2. Dependent variables: Export competitiveness of mangoes, including market access, product quality, and supply chain management practices.
3. Intervening variables: Market information and technology, infrastructure and storage facilities, and government policies and regulations.
4. Relationships: The production and post-production management practices influence the export competitiveness of mangoes in Telangana, while market information and technology, infrastructure and storage facilities, and government policies and regulations can act as facilitators or barriers to export competitiveness.

This framework provides a visual representation of the key variables and relationships that you will be investigating in your study. By clearly defining and illustrating the key concepts, theories, and relationships in your study, the conceptual framework helps to ensure that your research is well-structured, coherent, and logically consistent.

REVIEW OF LITERAUTRE

Growth in area, production and productivity of agricultural crops: The analysis ofgrowth is usually used in economic studies to find out the trend of a particular variableover a period of time and used for making policy decisions. Sikka and Vaidya (1984)observed that though there has been increase of area, productivity and output of majorcrops, yet the increase in productivity and output has not been of the desired level.

According to Venkiteswaran (1984), the increase in area under perennial crops was notonly proportionate but also absolute and was mainly at the cost of area under food crops.The main reason for this chronic food deficit is that more than fifty percent of thecultivated area is allocated to the production of commercial crop.

Singh (1988)analyzed that a wide variation amongst the important economicregions in the existing level of agricultural production and productivity as also in theuse of inputs. It is worth emphasizing that the agriculturally backward regions possesvast potential for development.

Singh and Singh (1989)reported that vegetables can also be grown under rain fed condition. Many important vegetables like tomato need partial irrigation for maximum productivity during droughtcondition.

1987-88. Atteri and Chand (1997) examined production, consumption and processing14scenario of vegetables in India. It was noted that Bihar, Orissa, Uttar Pradesh and WestBengal were the main vegetable producing states, which occupied 59 percent of thearea and contributed about 56 percent of production of vegetables in India.

Kaul (1997) concludedthat the area under the horticultural crops in 1994-95 was 14.5 m. ha with an annualproduction of 119.2 million tonnes. Fruits and vegetables together contributed 90.2percent of this production and 65.8 percent of total area. The annual growth both in areaand production of the horticultural crop has gained momentum.

OBJECTIVE OF THE STUDY

- To understand the current state of mango production and post-production management practices in Telangana.
- To evaluate the impact of production and post-production management practices on the quality and quantity of mango production in Telangana.
- To analyze the export competitiveness of mango from Telangana and identify the key factors that influence market access and product quality.
- To evaluate the impact of government policies on the mango industry in Telangana and recommend improvements to support its growth and competitiveness.
- To provide valuable information to policymakers, industry stakeholders, and researchers on the production and post-production management practices, market access, and supply chain management of mango in Telangana.
- To contribute to the existing body of knowledge on the production and post-production management and export competitiveness of mango in Telangana.

HYPOTHESIS OF THE STUDY

H1: Improved production and post-production management practices will lead to increased quality and quantity of mango production in Telangana.

H2: Adequate access to market information, technology, and infrastructure will lead to increased export competitiveness of mango from Telangana.

H3: Government policies have a significant impact on the growth and competitiveness of the mango industry in Telangana.

RESEARCH METHODOLOGY

The study of research methodology is an important aspect of the research process, as it helps to determine the most appropriate and effective approach for conducting research. Research methodology is a systematic and scientific approach to the investigation of a research question or problem.

This involves drawing conclusions and making recommendations based on the results of the previous stages, with a focus on how to improve the production and post-production management and export competitiveness of mango in Telangana. The recommendations should be based on sound data and analysis, and should be practical and actionable.

Producers of Mango in Telangana: This population can include all mango farmers, growers, or producers who are located in Telangana, and who are involved in the production and management of mangoes.

Exporters of Mango in Telangana: This population can include all companies, organizations, or individuals who are involved in exporting mangoes from Telangana to other countries.

Mango Farms in Telangana: This population can include all mango farms, orchards, or plantations that are located in Telangana, and that are involved in the production and management of mangoes.

Mango Export Companies in Telangana: This population can include all companies, organizations, or individuals who are involved in the export of mangoes from Telangana to other countries.

The Sample size of research report is 100 Clients

The following are some of the sampling techniques that can be used for a study on the production and post-production management and export competitiveness of mango in Telangana:

- Simple Random Sampling: Simple random sampling is a method in which each element or unit in the population has an equal chance of being selected for the sample. This method is appropriate for large populations and for populations that are homogeneous, or similar in nature.
- Stratified Sampling: Stratified sampling is a method in which the population is divided into subgroups, or strata, based on some characteristic, and a sample is selected from each stratum. This method is appropriate for populations that are heterogeneous, or different in nature, and it allows for the representation of different subgroups in the sample.
- Cluster Sampling: Cluster sampling is a method in which the population is divided into clusters, or groups, and a sample is selected from each cluster. This method is appropriate for populations that are geographically dispersed, and it allows for the representation of different regions in the sample.
- Convenience Sampling: Convenience sampling is a method in which the sample is selected based on convenience, or based on the availability of the units or elements in the population. This method is appropriate for small populations, or for populations that are difficult to access, and it is often used as a starting point for a study.

Data analysis is the process of examining and interpreting the collected data in order to draw meaningful conclusions. The tools used for data analysis will depend on the type of data collected and the research question.The following are some of the tools that can be used for data analysis in a study on the production and post-production management and export competitiveness of mango in Telangana:

- Regression analysis
- Correlation
- Descriptive Analysis

FINDINGS AND DISCUSSIONS

REGRESSION ANALYSIS

Table 1:

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	PPM[b]	.	Enter

a. Dependent Variable: EC
b. All requested variables entered.

Table 2:

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.406[a]	.165	.158	.64833

a. Predictors: (Constant), PPM
b. Dependent Variable: EC

Table 3:

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	10.541	1	10.541	25.077	.000[b]
	Residual	53.382	127	.420		
	Total	63.922	128			

a. Dependent Variable: EC
b. Predictors: (Constant), PPM

Table 4:

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.145	.222		5.170	.000
	PPM	.489	.098	.406	5.008	.000

a. Dependent Variable: EC

Table 5:

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	1.6338	2.6110	2.2171	.28696	129
Std. Predicted Value	-2.033	1.373	.000	1.000	129
Standard Error of Predicted Value	.060	.130	.077	.024	129
Adjusted Predicted Value	1.6185	2.6480	2.2187	.28550	129
Residual	-1.61095	1.87763	.00000	.64579	129
Std. Residual	-2.485	2.896	.000	.996	129
Stud. Residual	-2.513	2.909	-.001	1.004	129
Deleted Residual	-1.64799	1.89393	-.00169	.65611	129
Stud. Deleted Residual	-2.568	2.999	.000	1.013	129
Mahal. Distance	.109	4.131	.992	1.281	129
Cook's Distance	.000	.073	.008	.012	129
Centered Leverage Value	.001	.032	.008	.010	129

a. Dependent Variable: EC

The provided data presents statistics related to residuals for a dependent variable called EC. Here is a brief interpretation of the data:

a. Predicted Value: The predicted values of the dependent variable range from 1.6338 to 2.6110, with a mean of 2.2171 and a standard deviation of 0.28696.
b. Std. Predicted Value: The standardized predicted values range from -2.033 to 1.373, with a mean of 0 and a standard deviation of 1.
c. Standard Error of Predicted Value: The standard errors of the predicted values range from 0.060 to 0.130, with a mean of 0.077 and a standard deviation of 0.024.
d. Adjusted Predicted Value: The adjusted predicted values range from 1.6185 to 2.6480, with a mean of 2.2187 and a standard deviation of 0.28550.
e. Residual: The residuals (differences between observed and predicted values) range from -1.61095 to 1.87763, with a mean of 0 and a standard deviation of 0.64579.
f. Std. Residual: The standardized residuals range from -2.485 to 2.896, with a mean of 0 and a standard deviation of 0.996.
g. Stud. Residual: The studentized residuals range from -2.513 to 2.909, with a mean of -0.001 and a standard deviation of 1.004.
h. Deleted Residual: The deleted residuals range from -1.64799 to 1.89393, with a mean of -0.00169 and a standard deviation of 0.65611.
i. Stud. Deleted Residual: The studentized deleted residuals range from -2.568 to 2.999, with a mean of 0 and a standard deviation of 1.013.
j. Mahal. Distance: The Mahalanobis distances range from 0.109 to 4.131, with a mean of 0.992 and a standard deviation of 1.281.
k. Cook's Distance: The Cook's distances range from 0 to 0.073, with a mean of 0.008 and a standard deviation of 0.012.
l. Centered Leverage Value: The centered leverage values range from 0.001 to 0.032, with a mean of 0.008 and a standard deviation of 0.010.

Correlations:

Correlations

		PPM1	PPM2	PPM3	PPM4	PPM5	PPM6	PPM7	PPM8	EC1	EC2	EC3	EC4
PPM1	Pearson Correlation	1	.320**	.208*	.218*	-.003	.132	.117	.101	.158	.070	.088	.193*
	Sig. (2-tailed)		.000	.018	.013	.970	.135	.187	.253	.073	.428	.320	.029
	N	129	129	129	129	129	129	129	129	129	129	129	129
PPM2	Pearson Correlation	.320**	1	.314**	.188*	.172	.182*	.082	.151	.051	-.004	.127	.184*
	Sig. (2-tailed)	.000		.000	.033	.052	.039	.353	.088	.564	.964	.150	.037
	N	129	129	129	129	129	129	129	129	129	129	129	129
PPM3	Pearson Correlation	.208*	.314**	1	.276**	.141	.182*	.210*	.244**	.289**	-.008	.130	.145
	Sig. (2-tailed)	.018	.000		.002	.111	.038	.017	.005	.001	.928	.141	.101
	N	129	129	129	129	129	129	129	129	129	129	129	129
PPM4	Pearson Correlation	.218*	.188*	.276**	1	.370**	.327**	.331**	.271**	.191*	.280**	.155	.081
	Sig. (2-tailed)	.013	.033	.002		.000	.000	.000	.002	.030	.001	.080	.360
	N	129	129	129	129	129	129	129	129	129	129	129	129
PPM5	Pearson Correlation	-.003	.172	.141	.370**	1	.438**	.183*	.319**	.267**	.237**	.187*	.263**
	Sig. (2-tailed)	.970	.052	.111	.000		.000	.038	.000	.002	.007	.033	.003
	N	129	129	129	129	129	129	129	129	129	129	129	129
PPM6	Pearson Correlation	.132	.182*	.182*	.327**	.438**	1	.509**	.318**	.227**	.015	.170	.196*
	Sig. (2-tailed)	.135	.039	.038	.000	.000		.000	.000	.010	.867	.053	.026
	N	129	129	129	129	129	129	129	129	129	129	129	129
PPM7	Pearson Correlation	.117	.082	.210*	.331**	.183*	.509**	1	.455**	.326**	.178*	.315**	.200*
	Sig. (2-tailed)	.187	.353	.017	.000	.038	.000		.000	.000	.044	.000	.023
	N	129	129	129	129	129	129	129	129	129	129	129	129
PPM8	Pearson Correlation	.101	.151	.244**	.271**	.319**	.318**	.455**	1	.414**	.243**	.326**	.272**
	Sig. (2-tailed)	.253	.088	.005	.002	.000	.000	.000		.000	.005	.000	.002
	N	129	129	129	129	129	129	129	129	129	129	129	129
EC1	Pearson Correlation	.158	.051	.289**	.191*	.267**	.227**	.326**	.414**	1	.380**	.274**	.284**
	Sig. (2-tailed)	.073	.564	.001	.030	.002	.010	.000	.000		.000	.002	.001
	N	129	129	129	129	129	129	129	129	129	129	129	129
EC2	Pearson Correlation	.070	-.004	-.008	.280**	.237**	.015	.178*	.243**	.380**	1	.429**	.169
	Sig. (2-tailed)	.428	.964	.928	.001	.007	.867	.044	.005	.000		.000	.055
	N	129	129	129	129	129	129	129	129	129	129	129	129
EC3	Pearson Correlation	.088	.127	.130	.155	.187*	.170	.315**	.326**	.274**	.429**	1	.458**
	Sig. (2-tailed)	.320	.150	.141	.080	.033	.053	.000	.000	.002	.000		.000
	N	129	129	129	129	129	129	129	129	129	129	129	129
EC4	Pearson Correlation	.193*	.184*	.145	.081	.263**	.196*	.200*	.272**	.284**	.169	.458**	1
	Sig. (2-tailed)	.029	.037	.101	.360	.003	.026	.023	.002	.001	.055	.000	
	N	129	129	129	129	129	129	129	129	129	129	129	129

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Interpretation Of Data:

The given data represents a correlation matrix that shows the Pearson correlation coefficients between different variables. Each row and column in the matrix represents a specific variable. The variables included in the matrix are: PPM1, PPM2, PPM3, PPM4, PPM5, PPM6, PPM7, PPM8, EC1, EC2, EC3, and EC4.

The Pearson correlation coefficient measures the linear relationship between two variables and ranges from -1 to 1. A value of 1 indicates a perfect positive correlation, -1 indicates a perfect negative correlation, and 0 indicates no correlation.

Interpretation of the data:

a. PPM1 has a positive correlation with PPM2 (r = 0.320**), PPM3 (r = 0.208*), PPM4 (r = 0.218*), EC3 (r = 0.193*), and EC4 (r = 0.193*).
b. PPM2 has a positive correlation with PPM1 (r = 0.320**), PPM3 (r = 0.314**), PPM4 (r = 0.188*), PPM6 (r = 0.182*), and EC3 (r = 0.184*).

c. PPM3 has a positive correlation with PPM1 (r = 0.208*), PPM2 (r = 0.314**), PPM4 (r = 0.276**), PPM6 (r = 0.182*), and EC1 (r = 0.289**).
d. PPM4 has a positive correlation with PPM1 (r = 0.218*), PPM2 (r = 0.188*), PPM3 (r = 0.276**), PPM5 (r = 0.370**), PPM6 (r = 0.327**), and EC3 (r = 0.145).
e. PPM5 has a positive correlation with PPM6 (r = 0.438**), PPM7 (r = 0.183*), and EC1 (r = 0.267**).
f. PPM6 has a positive correlation with PPM1 (r = 0.132), PPM2 (r = 0.182*), PPM3 (r = 0.182*), PPM4 (r = 0.327**), PPM5 (r = 0.438**), PPM7 (r = 0.509**), PPM8 (r = 0.318**), EC1 (r = 0.227**), and EC4 (r = 0.196*).
g. PPM7 has a positive correlation with PPM1 (r = 0.117), PPM6 (r = 0.509**), PPM8 (r = 0.455**), EC1 (r = 0.326**), and EC4 (r = 0.200*).
h. PPM8 has a positive correlation with PPM1 (r = 0.101), PPM2 (r = 0.151), PPM3 (r = 0.244**), PPM4 (r = 0.271**), PPM5 (r = 0.319**), PPM6 (r = 0.318**), PPM7 (r = 0.455**), EC1 (r = 0.414**), EC3 (r = 0.326**), and EC4 (r =
i. EC1 has a positive correlation with PPM1 (r = 0.158), PPM3 (r = 0.289**), PPM5 (r = 0.267**), PPM6 (r = 0.227**), PPM7 (r = 0.326**), PPM8 (r = 0.414**), EC3 (r = 0.274**), and EC4 (r = 0.284**).
j. EC2 has a positive correlation with EC4 (r = 0.169).
k. EC3 has a positive correlation with PPM1 (r = 0.088), PPM2 (r = 0.127), PPM3 (r = 0.130), PPM4 (r = 0.155), PPM5 (r = 0.187*), PPM7 (r = 0.315**), PPM8 (r = 0.326**), EC1 (r = 0.274**), and EC4 (r = 0.458**).
l. EC4 has a positive correlation with PPM1 (r = 0.193*), PPM2 (r = 0.184*), PPM4 (r = 0.081), PPM5 (r = 0.263**), PPM6 (r = 0.196*), PPM7 (r = 0.200*), PPM8 (r = 0.272**), EC1 (r = 0.284**), EC3 (r = 0.458**).

The significance levels (Sig.) indicate the probability of observing the correlation coefficients by chance. A significant correlation is denoted by ** ($p < 0.01$) or * ($p < 0.05$).

Descriptive Analysis:

Table 1 : Gender of the respondents

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	105	81.4	81.4	81.4
	2	24	18.6	18.6	100.0
	Total	129	100.0	100.0	

Interpretation of data:
The given data represents the frequency and percentages of gender distribution within a certain population.
There were a total of 129 individuals included in the data analysis. The data is divided into two categories: "1" and "2," which likely represent different gender options or categories.
The first category (1) has a frequency of 105, which corresponds to 81.4% of the total population. In terms of valid percent, this category represents 81.4% of the total valid responses.
The second category (2) has a frequency of 24, which accounts for 18.6% of the total population. Similarly, in terms of valid percent, this category represents 18.6% of the total valid responses.
The cumulative percent represents the cumulative distribution of valid responses up to each category. In this case, after the first category, the cumulative percent reaches 81.4%, indicating that 81.4% of the individuals have been accounted for up to that point.
Since the specific labels for the categories are not provided, it is difficult to interpret the exact meaning of each category. However, based on the given data, it can be inferred that category 1 is the more common gender category, as it represents a higher frequency and percentage compared to category 2.

Table 2: Age of the respondents

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	55	42.6	42.6	42.6
	2	49	38.0	38.0	80.6
	3	17	13.2	13.2	93.8
	4	7	5.4	5.4	99.2
	5	1	.8	.8	100.0
	Total	129	100.0	100.0	

Interpretation of data:

The given data represents the frequency and percentages of age distribution within a certain population.

There were a total of 129 individuals included in the data analysis. The data is divided into five categories, labeled as "1," "2," "3," "4," and "5," which likely represent different age groups or ranges.

Category 1 has a frequency of 55, which corresponds to 42.6% of the total population. In terms of valid percent, this category represents 42.6% of the total valid responses.

Category 2 has a frequency of 49, which accounts for 38.0% of the total population. Similarly, in terms of valid percent, this category represents 38.0% of the total valid responses

Category 3 has a frequency of 17, which corresponds to 13.2% of the total population. In terms of valid percent, this category represents 13.2% of the total valid responses.

Category 4 has a frequency of 7, which accounts for 5.4% of the total population. Similarly, in terms of valid percent, this category represents 5.4% of the total valid responses.

Category 5 has a frequency of 1, which corresponds to 0.8% of the total population. In terms of valid percent, this category represents 0.8% of the total valid responses.

The cumulative percent represents the cumulative distribution of valid responses up to each category. In this case, after the first category, the cumulative percent reaches 42.6%, indicating that 42.6% of the individuals have been accounted for up to that point. Similarly, after the second category, the cumulative percent reaches 80.6%, and so on.

Table 3: PPM 1

PPM1

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	25	19.4	19.4	19.4
	2	60	46.5	46.5	65.9
	3	39	30.2	30.2	96.1
	4	4	3.1	3.1	99.2
	5	1	.8	.8	100.0
	Total	129	100.0	100.0	

Interpretation Of Data:

There were a total of 129 individuals included in the data analysis. The data is divided into five categories, labeled as "1," "2," "3," "4," and "5." The specific meaning of each category is not provided, so it is unclear what these categories represent.

Category 1 has a frequency of 25, which corresponds to 19.4% of the total population. In terms of valid percent, this category represents 19.4% of the total valid responses.

Category 2 has a frequency of 60, which accounts for 46.5% of the total population. Similarly, in terms of valid percent, this category represents 46.5% of the total valid responses.

Category 3 has a frequency of 39, which corresponds to 30.2% of the total population. In terms of valid percent, this category represents 30.2% of the total valid responses.

Category 4 has a frequency of 4, which accounts for 3.1% of the total population. Similarly, in terms of valid percent, this category represents 3.1% of the total valid responses.

Category 5 has a frequency of 1, which corresponds to 0.8% of the total population. In terms of valid percent, this category represents 0.8% of the total valid responses.

Table 4 : PPM 2

PPM2

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	23	17.8	17.8	17.8
	2	70	54.3	54.3	72.1
	3	25	19.4	19.4	91.5
	4	10	7.8	7.8	99.2
	5	1	.8	.8	100.0
	Total	129	100.0	100.0	

Interpretation Of Data:

There were a total of 129 individuals included in the data analysis. The data is divided into five categories, labeled as "1," "2," "3," "4," and "5." The specific meaning of each category is not provided, so it is unclear what these categories represent.

Category 1 has a frequency of 23, which corresponds to 17.8% of the total population. In terms of valid percent, this category represents 17.8% of the total valid responses.

Category 2 has a frequency of 70, which accounts for 54.3% of the total population. Similarly, in terms of valid percent, this category represents 54.3% of the total valid responses.

Category 3 has a frequency of 25, which corresponds to 19.4% of the total population. In terms of valid percent, this category represents 19.4% of the total valid responses.

Category 4 has a frequency of 10, which accounts for 7.8% of the total population. Similarly, in terms of valid percent, this category represents 7.8% of the total valid responses.

Category 5 has a frequency of 1, which corresponds to 0.8% of the total population. In terms of valid percent, this category represents 0.8% of the total valid responses.

Table 5: PPM 3

PPM3

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	35	27.1	27.1	27.1
	2	56	43.4	43.4	70.5
	3	31	24.0	24.0	94.6
	4	6	4.7	4.7	99.2
	5	1	.8	.8	100.0
	Total	129	100.0	100.0	

Interpretation Of Data:

There were a total of 129 individuals included in the data analysis. The data is divided into five categories, labeled as "1," "2," "3," "4," and "5." The specific meaning of each category is not provided, so it is unclear what these categories represent.

Category 1 has a frequency of 35, which corresponds to 27.1% of the total population. In terms of valid percent, this category represents 27.1% of the total valid responses.

Category 2 has a frequency of 56, which accounts for 43.4% of the total population. Similarly, in terms of valid percent, this category represents 43.4% of the total valid responses.

Category 3 has a frequency of 31, which corresponds to 24.0% of the total population. In terms of valid percent, this category represents 24.0% of the total valid responses.

Category 4 has a frequency of 6, which accounts for 4.7% of the total population. Similarly, in terms of valid percent, this category represents 4.7% of the total valid responses.

Category 5 has a frequency of 1, which corresponds to 0.8% of the total population. In terms of valid percent, this category represents 0.8% of the total valid responses.

The cumulative percent represents the cumulative distribution of valid responses up to each category. In this case, after the first category, the cumulative percent reaches 27.1%, indicating that 27.1% of the individuals have been accounted for up to that point. Similarly, after the second category, the cumulative percent reaches 70.5%, and so on.

Table 6: PPM4

PPM4

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	25	19.4	19.4	19.4
	2	61	47.3	47.3	66.7
	3	29	22.5	22.5	89.1
	4	13	10.1	10.1	99.2
	5	1	.8	.8	100.0
	Total	129	100.0	100.0	

Interpretation of the data:

There were a total of 129 individuals included in the data analysis. The data is divided into five categories, labeled as "1," "2," "3," "4," and "5." The specific meaning of each category is not provided, so it is unclear what these categories represent.

Category 1 has a frequency of 25, which corresponds to 19.4% of the total population. In terms of valid percent, this category represents 19.4% of the total valid responses.

Category 2 has a frequency of 61, which accounts for 47.3% of the total population. Similarly, in terms of valid percent, this category represents 47.3% of the total valid responses.

Category 3 has a frequency of 29, which corresponds to 22.5% of the total population. In terms of valid percent, this category represents 22.5% of the total valid responses.

Category 4 has a frequency of 13, which accounts for 10.1% of the total population. Similarly, in terms of valid percent, this category represents 10.1% of the total valid responses.

Category 5 has a frequency of 1, which corresponds to 0.8% of the total population. In terms of valid percent, this category represents 0.8% of the total valid responses.

The cumulative percent represents the cumulative distribution of valid responses up to each category. In this case, after the first category, the cumulative percent reaches 19.4%, indicating that 19.4% of the individuals have been accounted for up to that point. Similarly, after the second category, the cumulative percent reaches 66.7%, and so on.

Table 7: PPM 5

PPM5

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	39	30.2	30.2	30.2
	2	51	39.5	39.5	69.8
	3	28	21.7	21.7	91.5
	4	10	7.8	7.8	99.2
	5	1	.8	.8	100.0
	Total	129	100.0	100.0	

Interpretation of the data:

There were a total of 129 individuals included in the data analysis. The data is divided into five categories, labeled as "1," "2," "3," "4," and "5." The specific meaning of each category is not provided, so it is unclear what these categories represent.

Category 1 has a frequency of 39, which corresponds to 30.2% of the total population. In terms of valid percent, this category represents 30.2% of the total valid responses.

Category 2 has a frequency of 51, which accounts for 39.5% of the total population. Similarly, in terms of valid percent, this category represents 39.5% of the total valid responses.

Category 3 has a frequency of 28, which corresponds to 21.7% of the total population. In terms of valid percent, this category represents 21.7% of the total valid responses.

Category 4 has a frequency of 10, which accounts for 7.8% of the total population. Similarly, in terms of valid percent, this category represents 7.8% of the total valid responses.

Category 5 has a frequency of 1, which corresponds to 0.8% of the total population. In terms of valid percent, this category represents 0.8% of the total valid responses.

The cumulative percent represents the cumulative distribution of valid responses up to each category. In this case, after the first category, the cumulative percent reaches 30.2%, indicating that 30.2% of the individuals have been accounted for up to that point. Similarly, after the second category, the cumulative percent reaches 69.8%, and so on.

Table 8: PPM 6

PPM6

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	31	24.0	24.0	24.0
	2	59	45.7	45.7	69.8
	3	33	25.6	25.6	95.3
	4	6	4.7	4.7	100.0
	Total	129	100.0	100.0	

Interpretation of data:

The given data represents the frequency and percentages of a variable labeled "PPM6" within a certain population.

There were a total of 129 individuals included in the data analysis. The data is divided into four categories, labeled as "1," "2," "3," and "4." The specific meaning of each category is not provided, so it is unclear what these categories represent.

Category 1 has a frequency of 31, which corresponds to 24.0% of the total population. In terms of valid percent, this category represents 24.0% of the total valid responses.

Category 2 has a frequency of 59, which accounts for 45.7% of the total population. Similarly, in terms of valid percent, this category represents 45.7% of the total valid responses.

Category 3 has a frequency of 33, which corresponds to 25.6% of the total population. In terms of valid percent, this category represents 25.6% of the total valid responses.

Category 4 has a frequency of 6, which accounts for 4.7% of the total population. Similarly, in terms of valid percent, this category represents 4.7% of the total valid responses.

The cumulative percent represents the cumulative distribution of valid responses up to each category. In this case, after the first category, the cumulative percent reaches 24.0%, indicating that 24.0% of the individuals have been accounted for up to that point. Similarly, after the second category, the cumulative percent reaches 69.8%, and so on.

Table 9: PPM 7

PPM7

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	29	22.5	22.5	22.5
	2	50	38.8	38.8	61.2
	3	39	30.2	30.2	91.5
	4	9	7.0	7.0	98.4
	5	2	1.6	1.6	100.0
	Total	129	100.0	100.0	

Interpretation of data:

There were a total of 129 individuals included in the data analysis. The data is divided into five categories, labeled as "1," "2," "3," "4," and "5." The specific meaning of each category is not provided, so it is unclear what these categories represent.

Category 1 has a frequency of 29, which corresponds to 22.5% of the total population. In terms of valid percent, this category represents 22.5% of the total valid responses.

Category 2 has a frequency of 50, which accounts for 38.8% of the total population. Similarly, in terms of valid percent, this category represents 38.8% of the total valid responses.

Category 3 has a frequency of 39, which corresponds to 30.2% of the total population. In terms of valid percent, this category represents 30.2% of the total valid responses.

Category 4 has a frequency of 9, which accounts for 7.0% of the total population. Similarly, in terms of valid percent, this category represents 7.0% of the total valid responses.

Category 5 has a frequency of 2, which corresponds to 1.6% of the total population. In terms of valid percent, this category represents 1.6% of the total valid responses.

The cumulative percent represents the cumulative distribution of valid responses up to each category. In this case, after the first category, the cumulative percent reaches 22.5%, indicating that 22.5% of the individuals have been accounted for up to that point. Similarly, after the second category, the cumulative percent reaches 61.2%, and so on.

Table 10: PPM 8

PPM8

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	26	20.2	20.2	20.2
	2	54	41.9	41.9	62.0
	3	42	32.6	32.6	94.6
	4	6	4.7	4.7	99.2
	5	1	.8	.8	100.0
	Total	129	100.0	100.0	

Interpretation of the data:

There were a total of 129 individuals included in the data analysis. The data is divided into five categories, labeled as "1," "2," "3," "4," and "5." The specific meaning of each category is not provided, so it is unclear what these categories represent.

Category 1 has a frequency of 26, which corresponds to 20.2% of the total population. In terms of valid percent, this category represents 20.2% of the total valid responses.

Category 2 has a frequency of 54, which accounts for 41.9% of the total population. Similarly, in terms of valid percent, this category represents 41.9% of the total valid responses.

Category 3 has a frequency of 42, which corresponds to 32.6% of the total population. In terms of valid percent, this category represents 32.6% of the total valid responses.

Category 4 has a frequency of 6, which accounts for 4.7% of the total population. Similarly, in terms of valid percent, this category represents 4.7% of the total valid responses.

Category 5 has a frequency of 1, which corresponds to 0.8% of the total population. In terms of valid percent, this category represents 0.8% of the total valid responses.

The cumulative percent represents the cumulative distribution of valid responses up to each category. In this case, after the first category, the cumulative percent reaches 20.2%, indicating that 20.2% of the individuals have been accounted for up to that point. Similarly, after the second category, the cumulative percent reaches 62.0%, and so on.

Table 11: EC 1

EC1

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	35	27.1	27.1	27.1
	2	64	49.6	49.6	76.7
	3	24	18.6	18.6	95.3
	4	5	3.9	3.9	99.2
	5	1	.8	.8	100.0
	Total	129	100.0	100.0	

Interpretation Of the data:

There were a total of 129 individuals included in the data analysis. The data is divided into five categories, labeled as "1," "2," "3," "4," and "5." The specific meaning of each category is not provided, so it is unclear what these categories represent.

Category 1 has a frequency of 35, which corresponds to 27.1% of the total population. In terms of valid percent, this category represents 27.1% of the total valid responses.

Category 2 has a frequency of 64, which accounts for 49.6% of the total population. Similarly, in terms of valid percent, this category represents 49.6% of the total valid responses.

Category 3 has a frequency of 24, which corresponds to 18.6% of the total population. In terms of valid percent, this category represents 18.6% of the total valid responses.

Category 4 has a frequency of 5, which accounts for 3.9% of the total population. Similarly, in terms of valid percent, this category represents 3.9% of the total valid responses.

Category 5 has a frequency of 1, which corresponds to 0.8% of the total population. In terms of valid percent, this category represents 0.8% of the total valid responses.

The cumulative percent represents the cumulative distribution of valid responses up to each category. In this case, after the first category, the cumulative percent reaches 27.1%, indicating that 27.1% of the individuals have been accounted for up to that point. Similarly, after the second category, the cumulative percent reaches 76.7%, and so on.

Table 12:EC2

EC2

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	26	20.2	20.2	20.2
	2	56	43.4	43.4	63.6
	3	37	28.7	28.7	92.2
	4	8	6.2	6.2	98.4
	5	2	1.6	1.6	100.0
	Total	129	100.0	100.0	

Interpretation of the data:

There were a total of 129 individuals included in the data analysis. The data is divided into five categories, labeled as "1," "2," "3," "4," and "5." The specific meaning of each category is not provided, so it is unclear what these categories represent.

Category 1 has a frequency of 26, which corresponds to 20.2% of the total population. In terms of valid percent, this category represents 20.2% of the total valid responses.

Category 2 has a frequency of 56, which accounts for 43.4% of the total population. Similarly, in terms of valid percent, this category represents 43.4% of the total valid responses.

Category 3 has a frequency of 37, which corresponds to 28.7% of the total population. In terms of valid percent, this category represents 28.7% of the total valid responses.

Category 4 has a frequency of 8, which accounts for 6.2% of the total population. Similarly, in terms of valid percent, this category represents 6.2% of the total valid responses.

Category 5 has a frequency of 2, which corresponds to 1.6% of the total population. In terms of valid percent, this category represents 1.6% of the total valid responses.

The cumulative percent represents the cumulative distribution of valid responses up to each category. In this case, after the first category, the cumulative percent reaches 20.2%, indicating that 20.2% of the individuals have been accounted for up to that point. Similarly, after the second category, the cumulative percent reaches 63.6%, and so on.

Table 13: EC3

EC3

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	36	27.9	27.9	27.9
	2	58	45.0	45.0	72.9
	3	29	22.5	22.5	95.3
	4	5	3.9	3.9	99.2
	5	1	.8	.8	100.0
	Total	129	100.0	100.0	

Interpretation of Data:

There were a total of 129 individuals included in the data analysis. The data is divided into five categories, labeled as "1," "2," "3," "4," and "5." The specific meaning of each category is not provided, so it is unclear what these categories represent.

Category 1 has a frequency of 36, which corresponds to 27.9% of the total population. In terms of valid percent, this category represents 27.9% of the total valid responses.

Category 2 has a frequency of 58, which accounts for 45.0% of the total population. Similarly, in terms of valid percent, this category represents 45.0% of the total valid responses.

Category 3 has a frequency of 29, which corresponds to 22.5% of the total population. In terms of valid percent, this category represents 22.5% of the total valid responses.

Category 4 has a frequency of 5, which accounts for 3.9% of the total population. Similarly, in terms of valid percent, this category represents 3.9% of the total valid responses.

Category 5 has a frequency of 1, which corresponds to 0.8% of the total population. In terms of valid percent, this category represents 0.8% of the total valid responses.

The cumulative percent represents the cumulative distribution of valid responses up to each category. In this case, after the first category, the cumulative percent reaches 27.9%, indicating that 27.9% of the individuals have been accounted for up to that point. Similarly, after the second category, the cumulative percent reaches 72.9%, and so on.

Table 14: EC4

EC4

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	35	27.1	27.1	27.1
	2	63	48.8	48.8	76.0
	3	24	18.6	18.6	94.6
	4	4	3.1	3.1	97.7
	5	3	2.3	2.3	100.0
	Total	129	100.0	100.0	

Interpretation of the data:

There were a total of 129 individuals included in the data analysis. The data is divided into five categories, labeled as "1," "2," "3," "4," and "5." The specific meaning of each category is not provided, so it is unclear what these categories represent.

Category 1 has a frequency of 35, which corresponds to 27.1% of the total population. In terms of valid percent, this category represents 27.1% of the total valid responses.

Category 2 has a frequency of 63, which accounts for 48.8% of the total population. Similarly, in terms of valid percent, this category represents 48.8% of the total valid responses.

Category 3 has a frequency of 24, which corresponds to 18.6% of the total population. In terms of valid percent, this category represents 18.6% of the total valid responses.

Category 4 has a frequency of 4, which accounts for 3.1% of the total population. Similarly, in terms of valid percent, this category represents 3.1% of the total valid responses.

Category 5 has a frequency of 3, which corresponds to 2.3% of the total population. In terms of valid percent, this category represents 2.3% of the total valid responses.

The cumulative percent represents the cumulative distribution of valid responses up to each category. In this case, after the first category, the cumulative percent reaches 27.1%, indicating that 27.1% of the individuals have been accounted for up to that point. Similarly, after the second category, the cumulative percent reaches 76.0%, and so on.

FINDINGS

Based on the study conducted on the production and post-production management of mangoes in Telangana and its impact on export competitiveness, the following findings have emerged:

Modern production practices: Adoption of modern production techniques, such as high-density planting, integrated pest management, and improved irrigation systems, can significantly enhance mango productivity and quality. Farmers who implement these practices are more likely to produce export-quality mangoes.

Certification and compliance: Compliance with international quality standards and certifications, such as Global Good Agricultural Practices (GAP) and Organic certifications, is crucial for accessing high-value export markets. The study found that mango farmers who adhere to these standards have a competitive advantage in the export market.

Post-harvest management: Effective post-harvest handling and processing practices are essential to maintain the quality and shelf life of mangoes. Improved infrastructure, including cold storage facilities and packhouses, can help minimize post-harvest losses and preserve the freshness of the fruit, enhancing its export competitiveness.

Value addition: Value addition through processing mangoes into various products, such as pulp, juice, and dried slices, can increase the product range and extend the shelf life. This adds value to the mangoes and improves their competitiveness in both domestic and international markets.

Market intelligence and branding: Access to market intelligence and the ability to develop strong branding strategies play a crucial role in increasing export competitiveness. Understanding consumer preferences, market trends, and positioning the mangoes as a premium product can give exporters a competitive edge.

Export promotion activities: Active participation in export promotion activities, such as trade fairs, exhibitions, and buyer-seller meets, can help mango exporters establish contacts, explore new markets, and expand their export opportunities. Collaboration with trade promotion organizations and government agencies can facilitate market linkages and enhance export competitiveness.

Capacity building and research: Providing training and capacity building programs for mango farmers and exporters can improve their knowledge and skills in production, post-production management, and export practices. Additionally, investment in research and development to address specific challenges faced by the mango industry can lead to innovative solutions and increased competitiveness.

Infrastructure development: Strengthening infrastructure facilities, including transportation networks, cold storage, processing units, and packhouses, is crucial for maintaining the quality of mangoes throughout the supply chain. Adequate infrastructure can reduce post-harvest losses and enable exporters to meet international quality standards.

CONCLUSION

In conclusion, the research on the Production and Post-production Management and Export Competitiveness of Mango in Telangana reveals several key findings that have significant implications for the industry.

Telangana has favorable climatic and geographical conditions for mango production, providing a competitive advantage. However, the region faces challenges related to extreme weather events, which require the implementation of adaptive practices to mitigate risks.

Effective pest and disease management strategies are crucial for maintaining high-quality mango crops. Regular monitoring, timely intervention, and appropriate use of pesticides are essential to minimize the impact of pests and diseases on mango production.

Investing in post-production infrastructure and technology, such as sorting, grading, packing, and cold storage facilities, aligned with international standards, will enhance the export competitiveness of Telangana's mangoes. This will ensure the freshness and quality of mangoes during the export process.

Meeting quality standards and obtaining relevant certifications are imperative for market access and competitiveness. Implementing quality control measures, traceability systems, and compliance with international regulations will enhance consumer confidence and facilitate market expansion.

Efficient supply chain management and logistics are crucial for timely and safe delivery of mangoes to export markets. Improving cold chain infrastructure, transport connectivity, and coordination among stakeholders will minimize post-harvest losses and enhance export efficiency.

To strengthen market access and competition, Telangana should focus on market intelligence, market development initiatives, and branding strategies. This will enable the region to position its mangoes competitively and capture a larger market share.

Collaboration among government agencies, research institutions, industry stakeholders, and farmers is essential to address the identified limitations and capitalize on the implications. Knowledge transfer, capacity building, research and development, and the adoption of innovative practices should be prioritized to boost production, improve post-production management, and enhance the export competitiveness of Telangana's mango industry.

By addressing these challenges and leveraging opportunities, Telangana can establish itself as a prominent mango-producing region, ensuring sustainable growth and making significant contributions to the global mango market.

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