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A Study on the Perception of Farmers on the Impact of Input Cost of Agricultural Produce and Return on Investment in Mandya, Karnataka.

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Abstract

This study investigates the perceptions of farmers regarding the impact of Cost on Inputs on agricultural produce and return on investment. Utilizing SPSS data analysis, the research explores the relationships between demographic factors, such as gender, age, marital status, and monthly purchase frequency, and farmers' overall perspectives. Additionally, the study delves into specific Cost on Inputs, including investment in seeds, labour costs, transportation expenses, and additional costs for increasing the volume of produce. The findings reveal significant associations between demographic characteristics, Cost on Inputs, and farmers' perceptions, emphasizing the need for tailored interventions that account for the diverse perspectives within the farming community.

The results highlight the nuanced nature of farmers' views on various aspects of agricultural production, providing valuable insights for policymakers, agricultural extension services, and industry stakeholders. The study underscores the importance of considering individual characteristics and specific Cost on Inputs when formulating strategies to enhance agricultural practices and sustainability. By acknowledging and addressing the diverse perceptions within the farming community, this research contributes to the development of more effective policies and interventions, ultimately fostering a more resilient and equitable agricultural sector.

Key Words: Famers Perception, Cost on Inputs, Return on Investment, Agricultural Produce, Demographic Factors

Introduction

Agriculture, being a critical component of global economies, plays a pivotal role in sustaining livelihoods and ensuring food security. In recent years, farmers have faced numerous challenges, including fluctuating market conditions, climate change impacts, and evolving consumer demands. One of the fundamental concerns for farmers revolves around the intricate relationship between the Cost on Inputs of agricultural produce and the subsequent returns on investment. The agricultural sector is subject to various Cost on Inputs, encompassing seeds, fertilizers, pesticides, machinery, labour, and other resources. The dynamic nature of these input costs, influenced by factors such as market trends, technological advancements, and environmental conditions, poses significant challenges to farmers in optimizing their operations. Furthermore, the returns on investment in agriculture are subject to market prices, which are often volatile, and external factors like government policies, trade dynamics, and global economic conditions. Understanding the perception of farmers regarding the impact of Cost on Inputs on agricultural produce and the subsequent return on investment is essential for devising effective policies, interventions, and sustainable agricultural practices. This study aims to delve into the intricate web of challenges faced by farmers, exploring their perspectives, concerns, and strategies in managing the delicate balance between input costs and returns.

This study endeavours to contribute valuable insights into the challenges faced by farmers in managing input costs and optimizing returns, ultimately aiming to facilitate the development of informed policies and support mechanisms that empower farmers and foster sustainable agricultural practices.

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Literature Review

Pal, Govind & Radhika, C. & Bhaskar, K. Udaya & Prasad, S. Rajendra, (2016). The study seeks to assess the impact of ground seed production on farm profitability in Karnataka, focusing on primary data collected from 100 farmers in Chitra Durga district during the agricultural year 2013-14. The research employed tabular analysis and discriminant function analysis for data interpretation. Results indicated that groundnut seed farmers had larger average land holdings compared to grain farmers and the district average. Maize was the predominant crop in the region, followed by groundnut, ragi, Bengal gram, jowar, and others. The analysis highlighted that human labour constituted a significant portion of the total cost in groundnut seed production, while bullock and machine labour were prominent in grain production. Human labour requirements were higher in seed production due to activities like roughing and gap filling. Variable costs were comparatively greater in seed production, resulting in around an 18% higher total cost of cultivation compared to grain production. However, gross returns were approximately 27% higher in seed production, leading to a 40% higher net return in groundnut seed production. Discriminant analysis revealed that human labour, gross return, seed, manures and fertilizers, bullock, and machine labour were key contributors to discriminating between seed and grain production of groundnut. The study suggests popularizing seed production due to its higher yield and profitability, encouraging farmers to adopt certified seed production technology for enhanced productivity and net profit. Mb, Dastagiri. (2014). The primary focus of this study was on the growth and instability of onion production in Maharashtra. Factors such as unpredictable weather conditions, fluctuating market prices, and insufficient storage and market infrastructure were identified as key contributors to the instability in production. These challenges hindered farmers from making optimal decisions regarding the allocation of land and improving farm productivity. The study categorized three distinct periods: Period I (1980-81 to 1989-90), Period II (1990-91 to 1999-00), and Period III (2000-01 to 2010-11). The findings revealed that onion production in Maharashtra is primarily influenced by changes in acreage allocation. However, the study suggests that increasing the area under onion cultivation in the long run may not be sustainable without reducing the cultivation area of other vital crops. Therefore, the proposed solution lies in bridging the yield gap or enhancing the yield potential of onions. The study identified that the major cause of instability in onion production, particularly after Period II, was primarily linked to fluctuations in cultivation area, with yield instability playing a secondary role. Sukhpal Singh. (2017). This article addresses the persistent policy concern of small farm and small farmer viability in India, where agriculture is predominantly smallholder-based. While various definitions of small farms exist, the term "smallholder" is relative, denoting limited resource endowments compared to other farmers in local contexts. Small Indian farmers are grappling with agrarian distress, seeking ways to sustain their livelihoods from small plots. Drawing on empirical case studies of 35 small and prosperous farmers across Punjab, Gujarat, and Maharashtra, the study explores the Small Farmer, Prosperous Farmer (SFPF) model. Conducted in 2012, the study documents SFPFs' profiles, resources, costs, and profits, revealing success in terms of net income and prosperity despite small holdings. The findings identify key factors contributing to prosperity—personal, institutional, and social—and assess the role of policy and the business environment. The study aims to inform evidence-based policy and practical recommendations for fostering inclusive agricultural development in other regions by replicating successful SFPF models. Negi, s.C. & Pathania, Pawan & Sharma, Suresh & Sharma, Sanjay & Katoch, Mittu & Chaudhary, Sarwan & Kumar, Himachal & Pradesh, Krishi & Vishvavidyalaya,. (2018). The study aims to assess the existing agricultural production in Himachal Pradesh and recommend optimal production systems to enhance farm income. The state is divided into four agro-climatic zones, and data were collected from 160 farmers across two districts with varying land holdings. Results indicate that vegetable crops generate higher returns compared to cereals, oilseeds, and pulses. Cereal and vegetable crops cover a significant portion of the cropped area on medium-sized farms, with cereal crops accounting for 56.12% and vegetables for 14.39%. Oilseeds and pulses have lower coverage. The cropping intensity is observed at 197%. Among vegetables, lady’s finger, cauliflower, and French beans are found to be the most profitable, while tomato and brinjal exhibit lower returns due to bacterial wilt. A notable gap between average and potential yields in vegetable crops suggests a potential for development and the introduction of resistant and hybrid varieties. Challenges include inadequate availability of quality seeds. The study recommends crop-cum-dairy farming as the most remunerative system, emphasizing the need for capital at low interest rates. Additionally, improving pastures and grasslands with suitable legumes and grass species is crucial for adopting the suggested farming type. Reddy, Duv & Reddy, A Amarender & Bantilan, Cynthia. (2014). This article conducts a comprehensive review of the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), focusing on its impact and effectiveness at both state and village levels, with emphasis on inclusiveness, rural labor markets, and agriculture. The findings reveal variations in the effectiveness of implementation across states, with those

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integrating MGNREGA works with local planning experiencing higher success in terms of employment generation and asset creation, subsequently enhancing agricultural potential. The scheme demonstrates inclusivity by benefiting vulnerable sections of society, including scheduled castes, tribes, and women. The study underscores village-level differences in implementation, highlighting that effective execution leads to reductions in hunger and poverty. Notably, the MGNREGA has empowered rural laborers in the agricultural sector, increasing their bargaining power, resulting in higher wage rates, improved working conditions, and reduced exploitation. Samal, Parshuram & Rout, C. & Repalli, Sai & Jambhulkar, Nitiprasad. (2018). This paper assesses the growth trends in rice production and profitability in India using secondary data spanning from 1970-71 to 2015-16. The analysis focuses on the decadal growth in area, production, and yield of rice at both national and state levels. The findings indicate that the growth in rice cultivation area has either plateaued or declined in most states. Production growth is primarily attributed to increased productivity, emphasizing the need for future growth to come from enhanced yield through technological advancements. The study evaluates trends in costs and profits from 1980-81 to 2014-15, revealing a consistent increase in cultivation costs. However, the corresponding increase in profits has not been proportional. Irrigated states like Punjab, Haryana, and Andhra Pradesh have managed to maintain profits over the years, while rainfed states have faced losses, especially when considering the total cost of cultivation (C2). The ineffectiveness of the minimum support price, particularly in the eastern states, is identified as a key factor contributing to these losses. The paper suggests that the government should prioritize a review of procurement operations in the eastern states, involve private agencies in procurement, develop storage facilities, and improve market infrastructure to enable farmers to adopt modern farming practices and enhance productivity and profitability. Sethi, Narayan & Pradhan, Hemanta. (2012). This paper delves into the analysis of consumption expenditure patterns among rural households, aiming to illustrate the frequent changes in both food and non-food expenditure linked to variations in income and occupation. The study attributes the rise in consumption expenditure to factors such as increasing urbanization, the breakdown of traditional joint family structures, a growing desire for quality food, time constraints leading to a demand for convenience, a rising number of working women, forced increases in per-capita income, changing lifestyles, affluence, and a lack of saving attitude with insufficient awareness. Using income elasticity of expenditure as a proxy for the income elasticity of quantity demanded, the paper employs Engel ratio analysis to assess the impact of income and occupation on consumption expenditure for selected food and non-food commodities across different income and occupation classes in Western Odisha. The study considers the actual distribution of monthly per capita incomes and other relevant characteristics of diverse income classes to understand the influence of income and occupation on rural consumption patterns. The objectives of the paper include examining the impact of income and occupation on consumption expenditure among the rural population and analyzing the factors that influence rural consumption patterns. Sharma, Gaurav & Sharma, Priyanka & Pandey, A. (2022). Indian agriculture is undergoing a transformative shift, with a discernible trend in the last few decades towards diversification from traditional field crops to horticultural crops. This shift is not only a response to changing agricultural practices but also a strategy to increase farmers' income. The cultivation of flowers, in particular, has emerged as a lucrative alternative, offering higher profits per unit area compared to many traditional field crops. Flower-based mono or sequential cropping systems present viable options to boost income from the same parcel of land. Integrated farming systems, intercropping, bund plantation, and protected cultivation, incorporating flower crops, have proven to be both profitable and sustainable. A comparative analysis between households engaged in flower cultivation and those not involved in it highlights the significantly higher returns per unit of area for the former, despite incurring higher cultivation costs. This underscores the economic viability and potential for increased livelihoods through floriculture. Sonawane, Kaveri & Vg, Pokharkar & Nirgude, Rohit. (2019). Sunflower (Helianthus annuus L.), commonly known as "Surajmukhi," holds significant importance as an oilseed crop in India. This study encompassed a total of 450 randomly selected sunflower growers, categorized into low adopters (10.30%), medium adopters (73.33%), and high adopters (16.36%). The average annual employment for sunflower-growing families was 475.27 days, with crop production contributing 28.55% to the employment. The overall average annual gross income for sunflower-growing families stood at ₹5,06,984, with 63% of the income derived from crop production. The gap in seed use was reported at 14.60%. Chemical fertilizers, particularly the 'P' component, were used at higher levels. The per-hectare yield exhibited an increase from 5.8 to 11.88 quintals per hectare across different levels of adoption. The study revealed that additional yield came at increased costs, yet added returns also saw an uptick. The yield gap I and II ranged between 3.12% to 9.20% and 0.12% to 6.2%, respectively. The nine independent variables jointly explained 61% of the variation in sunflower output. Human labour (X1), Phosphorus (X5), and Technology adoption index (X9) were highly significant at the 1% level of significance. The cultivators reported challenges such as

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a lack of awareness of improved technology, expensive plant protection, and a shortage of human/bullock labour for interculture. Chatterjee, S. (2017). The present study focuses on assessing the state-wise variation in various cost components of paddy cultivation in India and the technological changes in rice cultivation during the period 2000-01 to 2009-10. Secondary data on input use and paddy output at the state level were analyzed, and exponential growth rates and instability of different cost components were calculated. The study reveals that despite stagnancy in the overall productivity of the crop sector in India, there is a prominent adoption of a mixed package of organic and inorganic practices for paddy in various states. Significant technological changes in rice cultivation were observed in Madhya Pradesh (5.40%), Kerala (3.74%), and Karnataka (3.18%). Farm mechanization, marked by an increase in the operational cost, especially the hiring rate of tractors and power tillers, emerged as a primary contributor to changes in productivity across states. Despite a notable rise in human labor wage rates, human labor continues to play a dominant role in Indian agriculture. The study also highlights irrigation as a key factor contributing to productivity change, particularly in rainfed rice cultivation regions. The contribution of fixed factors, influenced by the increasing opportunity cost of land, has witnessed an upward trend.

Objectives of the Study:

The Objective of the study is to evaluate farmers' perceptions of the relationship between input costs and the subsequent returns on investment in agricultural produce.

Research Methodology

This study is descriptive in nature as there is a requirement of in-depth understanding of the various Cost on Inputs and the returns on the produce. The research used a structure questionnaire on a 5-point Likert scale and survey was conducted among the farmers in the Mandya district of Karnataka. 117 fully filled in questionnaires were received for analysis. To gauge farmers' perceptions concerning the different Cost on Inputs associated with agricultural commodity production, an analysis of data was conducted using the SPSS application. Descriptive statistical measures, including Mean and Standard Deviation, were employed to offer insights into the central tendency and variability of each variable examined in the study. Chi-square was employed to test the hypothesis. Further Smart PLS S4 software was used to analyse and build SEM model.

Hypothesis

H0: There is no significant relationship among Cost on Inputs of Agricultural Produce and Return on Investment.
H1: There is significant relationship among Cost on Inputs of Agricultural Produce and Return on Investment.

Analysis of the data

SPSS software was used to analyse the data collected through the survey. Demographic factors considered for the study are, Gender (GR), Age (AG), Education (ED), Marital Status (MS), Monthly average purchase frequency (PF), Monthly spent on meals (SM) and the future of the farm in next 10 years (FF). Various Cost on Inputs considered for the study are, Money spent on seeds (IC1), cleaning and treatment charges on seeds (IC2), Labour Cost (LC), Transportation cost for buying seeds (TC1), Cost spent on transportation of Harvest (TC2), Cost spent on storing of agricultural produce (HC1), Additional cost incurred for increasing the volume of produce (VOP), Cost spent on land clearing, land repatriation, water and electricity (COP1), Cost spend on harvest, nutrients and fertilizers (COP2), Cost spent on Animal and Machine Labour (COP3), and Recovery percentage of the investment made (RP).

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum	Percentiles		
						25th	50th (Median)	75th
GR	117	1.73	.448	1	2	1.00	2.00	2.00
AG	117	3.11	1.216	1	5	2.00	3.00	4.00
ED	117	2.50	1.186	1	4	1.00	2.00	4.00

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MS	117	3.03	1.038	1	4	3.00	3.00	4.00
PF	117	2.85	.943	1	4	2.00	3.00	4.00
SM	117	3.15	1.297	1	5	2.00	3.00	4.00
FF	117	3.25	1.332	1	5	2.00	3.00	4.00
RP	117	2.03	.730	1	3	1.50	2.00	3.00
IC1	117	4.23	.687	2	5	4.00	4.00	5.00
IC2	117	4.09	.707	2	5	4.00	4.00	4.50
LC	117	4.19	.656	2	5	4.00	4.00	5.00
TC1	117	4.08	.544	2	5	4.00	4.00	4.00
TC2	117	3.91	.541	2	5	4.00	4.00	4.00
HC1	117	4.09	.535	3	5	4.00	4.00	4.00
VOP	117	3.74	.968	2	5	3.00	4.00	4.50
COP1	117	4.00	.000	4	4	4.00	4.00	4.00
COP2	117	3.95	.585	2	5	4.00	4.00	4.00
COP3	117	3.97	.425	2	5	4.00	4.00	4.00

(Source: Primary Data Analysis using SPSS)

The above Descriptive Statistics table presents an analysis of various demographic factors and Cost on Inputs in agricultural production based on data collected through a survey. The analysis provides valuable insights into the demographic factors and Cost on Inputs influencing farmers' perceptions in agricultural production. The interpretation of means and standard deviations helps understand the central tendency and variability in these perceptions, which is crucial for making informed decisions in agricultural management and planning. In summary, there is significant variability in the perception of the farmers about the various Cost on Inputs of the agriculture.

GR			
	Observed N	Expected N	Residual
Female	32	58.5	-26.5
Male	85	58.5	26.5
Total	117		

(Source: Primary Data Analysis using SPSS)

The observed counts provide a breakdown of respondents based on their gender. The data indicates that most respondents in the survey are male (85 individuals), while the number of female respondents is 32. This information offers insights into the gender composition of the surveyed population, highlighting the gender distribution among the respondents.

AG			
	Observed N	Expected N	Residual
Less than 20	14	23.4	-9.4
21–30	24	23.4	.6
31–40	28	23.4	4.6
41–50	37	23.4	13.6
51–60	14	23.4	-9.4
Total	117		

(Source: Primary Data Analysis using SPSS)

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The observed counts provide a breakdown of respondents based on their age groups. The data indicates the distribution of respondents across different age ranges, offering insights into the age composition of the surveyed population. Most respondents fall within the 41–50 age range (37 individuals), and there is a relatively even distribution across other age groups. This information helps understand the age distribution among the surveyed population.

ED			
	Observed N	Expected N	Residual
High School	33	29.2	3.8
University/College	26	29.2	-3.2
Higher Education	24	29.2	-5.2
Did not go to school	34	29.2	4.8
Total	117		

(Source: Primary Data Analysis using SPSS)

The observed counts provide a breakdown of respondents based on their education levels. The data indicates the distribution of respondents across different education levels, offering insights into the educational composition of the surveyed population. Most respondents have completed high school (33 individuals), followed by those who did not go to school (34 individuals). There is a relatively even distribution across university/college (26 individuals) and higher education (24 individuals). This information helps understand the educational background of the surveyed population.

MS			
	Observed N	Expected N	Residual
Single	20	29.2	-9.2
Unmarried with children	1	29.2	-28.2
Married with no children	52	29.2	22.8
Married with children	44	29.2	14.8
Total	117		

(Source: Primary Data Analysis using SPSS)

Most respondents are classified as "Married with no children" (52 individuals), followed by "Married with children" (44 individuals). There is a smaller representation of individuals in the "Single" category (20 individuals) and a very small representation in the "Unmarried with children" category (1 individual). This information offers insights into the marital status composition of the surveyed population.

PF			
	Observed N	Expected N	Residual
Less than 1 time	12	29.2	-17.2
2–3 times	26	29.2	-3.2
3–4 times	47	29.2	17.8
Above 4 times	32	29.2	2.8
Total	117		

(Source: Primary Data Analysis using SPSS)

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The observed counts provide insights into the distribution of respondents based on their reported Monthly Average Purchase Frequency. The data suggests a varied distribution, with respondents falling into different categories indicating their purchasing behaviour. This information is valuable for understanding the frequency of purchases among the surveyed population and can be used for marketing or business planning purposes.

SM			
	Observed N	Expected N	Residual
Less than Rs. 5000	17	23.4	-6.4
Rs. 5001–7000	20	23.4	-3.4
Rs. 7001–9000	27	23.4	3.6
Rs. 9001–11000	34	23.4	10.6
Above Rs. 11,000	19	23.4	-4.4
Total	117		

(Source: Primary Data Analysis using SPSS)

The observed counts for Monthly Spending on Meals (SM) reveal diverse spending patterns among the surveyed population. Most respondents reported spending between Rs. 7001 and Rs. 11000 on meals monthly, with 27 individuals in the Rs. 7001–9000 category and 34 individuals in the Rs. 9001–11000 category. Additionally, there is a substantial representation in the Rs. 5001–7000 category with 20 respondents, while 17 individuals reported spending less than Rs. 5000. There is also a noteworthy group of respondents (19 individuals) who reported spending above Rs. 11,000 on meals monthly. Overall, the data indicates a varied distribution in monthly spending on meals, reflecting the diverse financial behaviours and preferences within the surveyed population.

FF			
	Observed N	Expected N	Residual
Normal business as usual	15	23.4	-8.4
Expand farming business	23	23.4	-.4
Allow family member(s) to manage the farm	21	23.4	-2.4
Sell the agricultural land	34	23.4	10.6
Rent for agricultural purpose	24	23.4	.6
Total	117		

(Source: Primary Data Analysis using SPSS)

The observed counts for Future of the Farm in the next 10 years (FF) present a range of intentions among the surveyed farmers. Notably, a substantial number of respondents (34 individuals) expressed the intention to sell their agricultural land, suggesting a significant consideration of liquidating assets. Additionally, there is a noteworthy group of farmers (23 individuals) looking to expand their farming business, indicating an interest in growth and development. Others are considering maintaining the status quo with 15 respondents opting for "Normal business as usual," while 21 individuals plan to involve family members in managing the farm. Renting agricultural land for agricultural purposes is also considered by 24 respondents. This diversity in responses underscores the various strategic directions farmers are

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contemplating for the future of their farms, reflecting a mix of preservation, expansion, and strategic changes in land management.

RP			
	Observed N	Expected N	Residual
less than 50%	29	39.0	-10.0
51% to 75%	55	39.0	16.0
76% to 100%	33	39.0	-6.0
Total	117		

(Source: Primary Data Analysis using SPSS)

The observed counts for the Recovery Percentage of Investment Made suggest varying degrees of success in recovering investments among the surveyed farmers. The majority of respondents (55 individuals) reported a recovery percentage ranging from 51% to 75%, indicating a moderate level of success in recouping their investments. Additionally, 33 individuals reported a higher level of success, with a recovery percentage falling in the "76% to 100%" category, suggesting a more favourable outcome in terms of investment returns. Conversely, 29 respondents reported a recovery percentage of less than 50%, indicating a lower degree of success in recuperating their initial investments. This diversity in reported recovery percentages reflects the nuanced financial situations and success levels among the surveyed farmers, highlighting the challenges and variations in investment outcomes within the agricultural sector.

IC1			
	Observed N	Expected N	Residual
Disagree	5	29.2	-24.2
Neutral	2	29.2	-27.2
Agree	71	29.2	41.8
Strongly Agree	39	29.2	9.8
Total	117		

(Source: Primary Data Analysis using SPSS)

The observed counts for the perception of farmers regarding the investment in seeds (IC1) reveal a predominant positive sentiment. A substantial number of respondents, 71 individuals, agreed, while 39 individuals strongly agreed that the investment in seeds is perceived positively. Conversely, a small number of respondents, 5 individuals, disagreed with this sentiment, and only 2 individuals expressed a neutral stance. This overwhelmingly positive perception suggests that a significant majority of farmers in the study view investments in seeds favourably, emphasizing the importance and positive impact they associate with such financial commitments in their agricultural practices. This positive sentiment can have implications for decision-making processes related to seed investments, highlighting the overall confidence and optimism among the surveyed farmers regarding the returns on seed-related expenditure.

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IC2			
	Observed N	Expected N	Residual
Disagree	6	29.2	-23.2
Neutral	6	29.2	-23.2
Agree	76	29.2	46.8
Strongly Agree	29	29.2	-.2
Total	117		

(Source: Primary Data Analysis using SPSS)

The observed counts for the perception of farmers regarding the cleaning and treatment charges on seeds (IC2) indicate a generally positive sentiment toward this aspect of agricultural investment. Most respondents, 76 individuals, expressed agreement, while 29 individuals strongly agreed with the perception that the cleaning and treatment charges on seeds are viewed positively. Additionally, 6 respondents each expressed disagreement and neutrality on this matter. This distribution suggests that a significant portion of the surveyed farmers holds a favourable view of the necessity and benefits associated with investing in cleaning and treatment charges for seeds. The positive sentiment may reflect a recognition of the importance of quality seed treatments in ensuring a successful and productive harvest, influencing the decision-making processes of the farmers in this study.

LC			
	Observed N	Expected N	Residual
Disagree	4	29.2	-25.2
Neutral	4	29.2	-25.2
Agree	75	29.2	45.8
Strongly Agree	34	29.2	4.8
Total	117		

(Source: Primary Data Analysis using SPSS)

The observed counts for the perception of farmers regarding labour costs (LC) in agricultural production reveal a predominant positive sentiment. Most respondents, 75 individuals, expressed agreement, while 34 individuals strongly agreed that labour costs in agricultural activities are viewed positively. Additionally, 4 respondents each expressed disagreement and neutrality on this matter. This distribution suggests that a significant portion of the surveyed farmers holds a favourable view of the importance and impact of labour costs in agricultural production. The positive sentiment may indicate an acknowledgment of the essential role that labour plays in various agricultural tasks, influencing the decision-making processes of the farmers in this study. The recognition of the value of labour costs underscores its significance in the overall agricultural investment and production cycle.

TC1			
	Observed N	Expected N	Residual
Disagree	3	29.2	-26.2
Neutral	4	29.2	-25.2
Agree	91	29.2	61.8
Strongly Agree	19	29.2	-10.2
Total	117		

(Source: Primary Data Analysis using SPSS)

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The observed counts for the perception of farmers regarding transportation costs for buying seeds (TC1) indicate a strongly positive sentiment. The majority of respondents, 91 individuals, expressed agreement, while 19 individuals strongly agreed that transportation costs for buying seeds are viewed positively. Additionally, 3 respondents expressed disagreement, and 4 individuals expressed neutrality on this matter. This distribution suggests that an overwhelming majority of the surveyed farmers hold a favourable view of the importance and impact of transportation costs in the procurement of seeds. The positive sentiment may reflect an understanding of the significance of efficient transportation in ensuring timely and cost-effective seed acquisition, influencing the decision-making processes of the farmers in this study. The recognition of the value of transportation costs highlights its role in facilitating the accessibility and availability of seeds for agricultural activities.

TC2			
	Observed N	Expected N	Residual
Disagree	7	29.2	-22.2
Neutral	2	29.2	-27.2
Agree	103	29.2	73.8
Strongly Agree	5	29.2	-24.2
Total	117		

(Source: Primary Data Analysis using SPSS)

The observed counts for the perception of farmers regarding transportation costs for the harvest (TC2) suggest a predominantly positive sentiment. Most respondents, 103 individuals, expressed agreement, while 5 individuals strongly agreed that transportation costs for the harvest are viewed positively. Additionally, 7 respondents expressed disagreement, and 2 individuals expressed neutrality on this matter. This distribution indicates that a significant majority of the surveyed farmers hold a favourable view of the importance and impact of transportation costs in the post-harvest stage. The positive sentiment may reflect an acknowledgment of the critical role transportation plays in ensuring the efficient and timely movement of harvested produce, influencing the decision-making processes of the farmers in this study. The recognition of the value of transportation costs underscores its significance in the overall agricultural production cycle and supply chain.

HC1			
	Observed N	Expected N	Residual
Neutral	12	39.0	-27.0
Agree	83	39.0	44.0
Strongly Agree	22	39.0	-17.0
Total	117		

(Source: Primary Data Analysis using SPSS)

The observed counts for the perception of farmers regarding the cost spent on storing agricultural produce (HC1) indicate a predominantly positive sentiment. Most respondents, 83 individuals, expressed agreement, while 22 individuals strongly agreed that the cost spent on storing agricultural produce is viewed positively. Additionally, 12 respondents expressed a neutral stance on this matter. This distribution suggests that a significant majority of the surveyed farmers hold a favourable view of the importance and impact of investing in storage facilities for their agricultural produce. The positive sentiment may reflect an acknowledgment of the critical role storage plays in preserving the quality and marketability of produce, influencing the decision-making processes of the farmers in this study. The recognition of the value of storage

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costs underscores its significance in managing the post-harvest stage and ensuring the long-term viability of agricultural products.

VOP			
	Observed N	Expected N	Residual
Disagree	14	29.2	-15.2
Neutral	32	29.2	2.8
Agree	42	29.2	12.8
Strongly Agree	29	29.2	-.2
Total	117		

(Source: Primary Data Analysis using SPSS)

The observed counts for the perception of farmers regarding the additional cost incurred for increasing the volume of produce (VOP) suggest a varied sentiment. A notable number of respondents, 42 individuals, expressed agreement, while 29 individuals strongly agreed that the additional cost incurred for increasing the volume of produce is viewed positively. On the other hand, 14 respondents expressed disagreement, and 32 individuals expressed a neutral stance on this matter. This distribution indicates a diversity of opinions among the surveyed farmers regarding the perceived value and impact of investing additional costs to increase the volume of their agricultural produce. The range of responses suggests that farmers have differing perspectives on the benefits and drawbacks associated with such investments, influencing their decision-making processes in agricultural production.

COP1			
	Observed N	Expected N	Residual
Agree	117	117.0	.0
Total	117[a]		
a. This variable is constant. Chi-Square Test cannot be performed.			

(Source: Primary Data Analysis using SPSS)

The provided data for the perception of farmers regarding the cost spent on land clearing, land repatriation, water, and electricity (COP1) indicates that all respondents (117 individuals) agreed with this aspect. The expected count is also 117, resulting in a residual of 0.0. This suggests a complete alignment between the observed and expected counts, indicating unanimous agreement among the surveyed farmers regarding the importance and necessity of investing in land clearing, repatriation, and utilities such as water and electricity. The absence of any deviation from the expected count suggests a high level of consensus among the respondents on the positive perception of incurring costs in these specific agricultural activities. This unanimous agreement may reflect the farmers' recognition of the significance of these investments in optimizing agricultural land for productive use.

COP2			
	Observed N	Expected N	Residual
Disagree	6	29.2	-23.2
Neutral	5	29.2	-24.2
Agree	95	29.2	65.8
Strongly Agree	11	29.2	-18.2
Total	117		

(Source: Primary Data Analysis using SPSS)

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The observed counts for the perception of farmers regarding the cost spent on harvest, nutrients, and fertilizers (COP2) indicate a generally positive sentiment. The majority of respondents, 95 individuals, expressed agreement, while 11 individuals strongly agreed that the cost spent on harvest, nutrients, and fertilizers is viewed positively. Additionally, 6 respondents expressed disagreement, and 5 individuals expressed a neutral stance on this matter. This distribution suggests that a significant majority of the surveyed farmers hold a favourable view of the importance and impact of investing in the mentioned agricultural inputs. The positive sentiment may reflect an acknowledgment of the critical role these inputs play in enhancing crop yield and quality, influencing the decision-making processes of the farmers in this study. The diversity of opinions also indicates that some farmers may have reservations or neutral views on the perceived benefits of such investments.

COP3			
	Observed N	Expected N	Residual
Disagree	3	29.2	-26.2
Neutral	3	29.2	-26.2
Agree	105	29.2	75.8
Strongly Agree	6	29.2	-23.2
Total	117		

(Source: Primary Data Analysis using SPSS)

The observed counts for the perception of farmers regarding the cost spent on animal and machine labour (COP3) indicate a predominantly positive sentiment. Most respondents, 105 individuals, expressed agreement, while 6 individuals strongly agreed that the cost spent on animal and machine labour is viewed positively. Additionally, 3 respondents expressed disagreement, and 3 individuals expressed a neutral stance on this matter. This distribution suggests that a significant majority of the surveyed farmers hold a favourable view of the importance and impact of investing in animal and machine labour in their agricultural operations. The positive sentiment may reflect an acknowledgment of the efficiency and productivity gains associated with the use of technology and animal labour in farming activities, influencing the decision-making processes of the farmers in this study. The diversity of opinions also indicates that a small number of farmers may have reservations or neutral views on the perceived benefits of such investments.

Test Statistics																	
	GR	AG	ED	MS	PF	SM	FF	RP	IC1	IC2	LC	TC1	TC2	HC1	VOP	COP2	COP3
Chi-Square	24.009[a]	16.376[b]	2.556[c]	55.342[c]	21.564[c]	8.427[b]	8.085[b]	10.051[d]	1.083E2[c]	1.117E2[c]	1.159E2[c]	1.793E2[c]	2.484E2[c]	75.744[d]	13.769[c]	1.978E2[c]	2.618E2[c]
df	1	4	3	3	3	4	4	2	3	3	3	3	3	2	3	3	3
Asymp. Sig.	.000	.003	.465	.000	.000	.077	.088	.007	.000	.000	.000	.000	.000	.000	.003	.000	.000
a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 58.5.																	
b. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 23.4.																	

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Test Statistics																
	GR	AG	ED	MS	PF	SM	FF	RP	IC1	IC2	LC	TC1	TC2	HC1	VOP	COP2	COP3
Chi-Square	24.009[a]	16.376[b]	2.556[c]	55.342[c]	21.564[c]	8.427[b]	8.085[b]	10.051[d]	1.083E2[c]	1.117E2[c]	1.159E2[c]	1.793E2[c]	2.484E2[c]	75.744[d]	13.769[c]	1.978E2[c]	2.618E2[c]
c. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 29.3.																	
d. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 39.0.																	

(Source: Primary Data Analysis using SPSS)

The chi-square test results reveal significant associations between demographic factors, Cost on Inputs, and farmers' perceptions of the impact of Cost on Inputs and return on investment in agriculture. First and foremost, gender (GR), age (AG), marital status (MS), monthly average purchase frequency (PF), future plans for the farm (FF), risk perception (RP), investment in seeds (IC1), cleaning and treatment charges on seeds (IC2), labour cost (LC), transportation cost for buying seeds (TC1), transportation cost for harvest (TC2), cost spent on storing agricultural produce (HC1), additional cost incurred for increasing the volume of produce (VOP), cost spent on harvest, nutrients, and fertilizers (COP2), and cost spent on animal and machine labour (COP3) all demonstrate statistically significant associations with farmers' overall perception.

The chi-square test indicates that gender plays a significant role in shaping farmers' perspectives, with a p-value of 0.000. Similarly, age groups (AG) exhibit significant differences in perception, highlighting that varying age brackets within the farming community hold distinct views on the impact of Cost on Inputs. Additionally, marital status (MS) and monthly purchase frequency (PF) both demonstrate significant associations, emphasizing the influence of personal and economic factors on farmers' perceptions. Furthermore, risk perception (RP) is significantly linked to overall perception, underscoring the importance of how farmers perceive and manage risks in their agricultural practices. Therefore, the Null Hypothesis is Rejected as there is significant relationship among Cost on Inputs of agricultural produce and return on investment.

SEM Model built using Smart PLS S4

In this study, Smart PLS S4 is utilized to construct an SEM model to delve into the intricate interconnections between demographic factors and various costs incurred in agricultural practices. The focus is on understanding how demographic variables, including Gender (GR), Age (AG), Education (ED), Marital Status (MS), Monthly Average Purchase Frequency (PF), Monthly Spending on Meals (SM), and Future Farm Outlook in the Next 10 Years (FF), relate to and influence the costs associated with different inputs in farming.

By utilizing Smart PLS S4, this study seeks to contribute valuable insights into the multifaceted dynamics of demographic factors and costs in agriculture. The SEM model constructed with Smart PLS S4 is anticipated to provide a nuanced understanding of how demographic variables influence the financial aspects of farming practices. The outcomes of this analysis are expected to offer practical implications for stakeholders in the agricultural sector, guiding informed decision-making and policy formulation for sustainable agricultural development.

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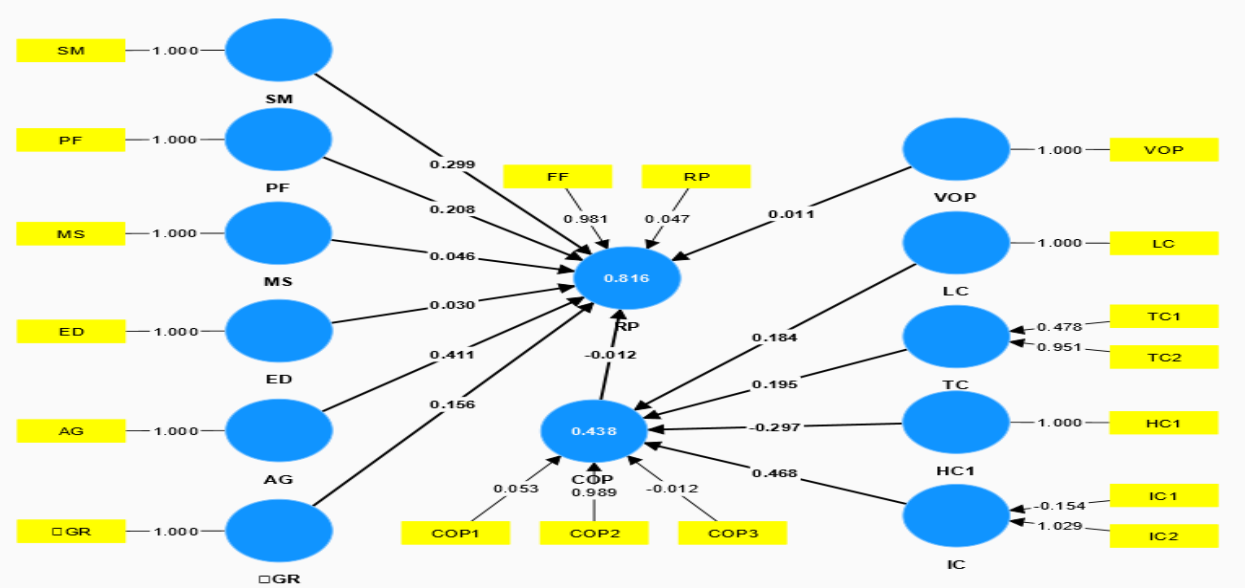

(Source: Primary Data Analysis using Smart PLS S4)

Path Coefficient - Matrix

	AG	COP	ED	HC1	IC	LC	MS	PF	RP	SM	TC	VOP	GR
AG									0.411				
COP									-0.012				
ED									0.030				
HC1		-0.297											
IC		0.468											
LC		0.184											
MS									0.046				
PF									0.208				
RP													
SM									0.299				
TC		0.195											
VOP									0.011				
GR									0.156				

(Source: Primary Data Analysis using Smart PLS S4)

(Source: Primary Data Analysis using Smart PLS S4)

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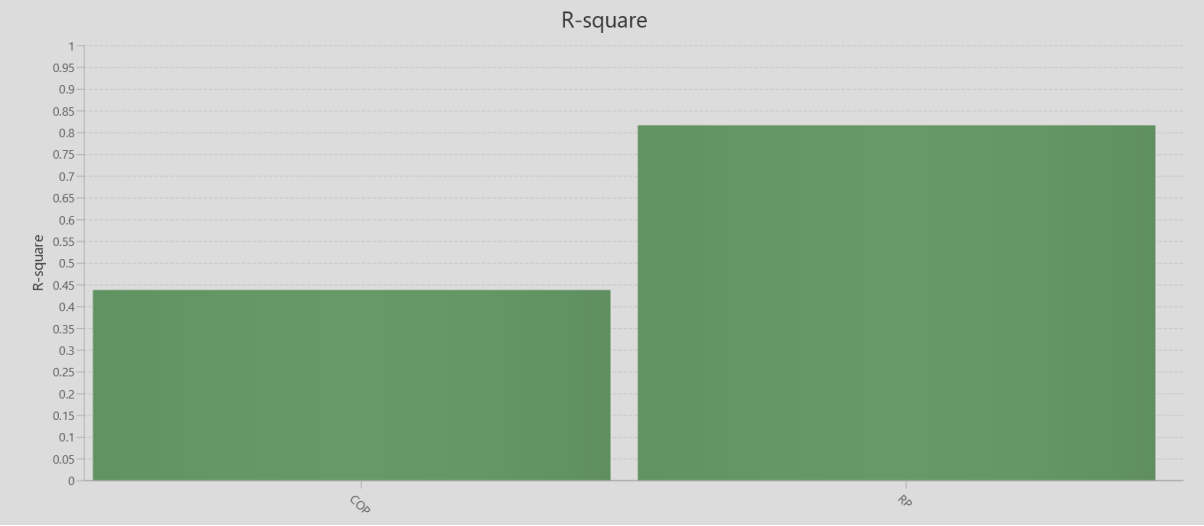
The Smart PLS S4 results reveal several significant relationships in the study on farmers' perceptions of input costs and returns on investment in Mandya, Karnataka. Notably, age (AG) has a positive association with various input costs (IC, LC, PF, VOP) and gender (GR). The cost on inputs (COP) negatively relates to the cost spent on storing agricultural produce (HC1). Education (ED) shows a slight positive connection with marital status (MS). Monthly spent on meals (SM) positively correlates with age, emphasizing the role of demographic factors in shaping farmers' perspectives. The findings underscore the complexity of farmers' views, emphasizing the need for tailored interventions that consider individual characteristics in agricultural policy and intervention planning.

R-square

	R-square	R-square adjusted
COP	0.438	0.413
RP	0.816	0.800

(Source: Primary Data Analysis using Smart PLS S4)



(Source: Primary Data Analysis using Smart PLS S4)

The R-square values for Cost on Inputs (COP) and Recovery Percentage (RP) in the Smart PLS S4 results indicate the model's effectiveness in explaining variance in these key variables. The COP model accounts for approximately 43.8% of the variance in Cost on Inputs, suggesting a moderate fit. Meanwhile, the RP model demonstrates a robust fit, explaining around 81.6% of the variance. The adjusted R-square values, considering model complexity, reinforce these findings, with COP and RP showing adjusted R-square values of 41.3% and 80%, respectively. These results signify the model's ability to capture a substantial portion of the variability in farmers' cost perceptions and recovery percentages, providing confidence in the explanatory power of the specified predictors.

f-square - Matrix

	AG	COP	ED	HC1	IC	LC	MS	PF	RP	SM	TC	VOP	GR
AG									0.207				
COP									0.001				
ED									0.003				
HC1		0.149											
IC		0.377											
LC		0.043											
MS									0.006				
PF									0.088				

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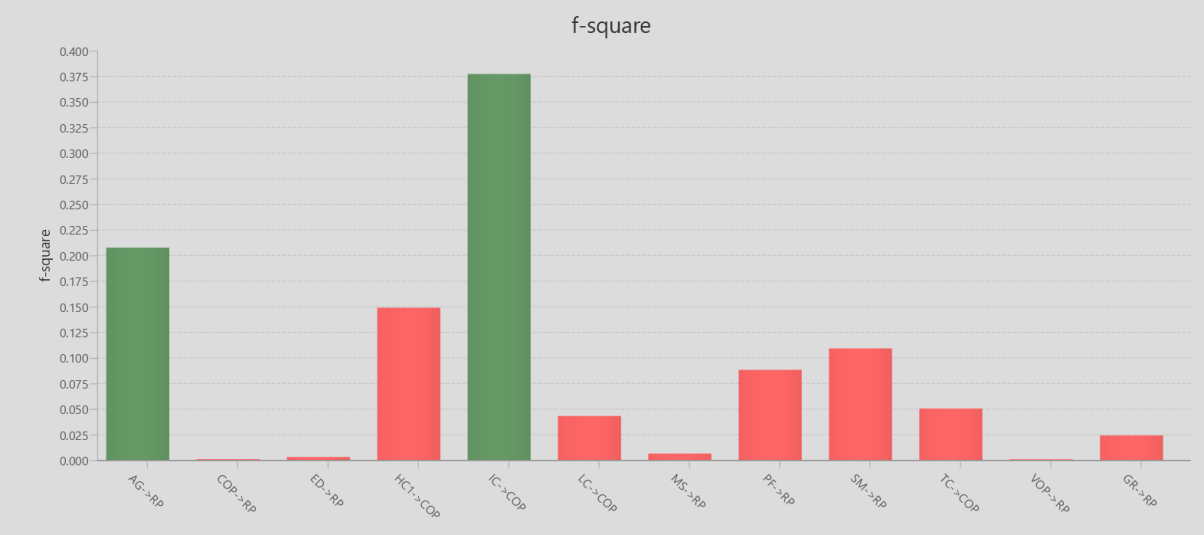
RP													
SM									0.109				
TC		0.050											
VOP									0.001				
GR									0.024				

(Source: Primary Data Analysis using Smart PLS S4)



(Source: Primary Data Analysis using Smart PLS S4)

The f-square values in the Smart PLS S4 results offer insights into the practical significance of latent variables in the structural model. Notably, variables like Money spent on seeds (IC) and Monthly average purchase frequency (PF) exhibit substantial effect sizes, suggesting a notable impact on the dependent variables. Age (AG) and Monthly spent on meals (SM) demonstrate moderate effect sizes, indicating moderate influence. Conversely, variables such as Cost on Inputs (COP) and Additional cost incurred for increasing the volume of produce (VOP) show minimal effect sizes, suggesting that factors external to the model may contribute more significantly to their variability. These findings highlight the varying degrees of influence that different factors exert within the agricultural context studied, guiding the prioritization of interventions for improved farming practices and sustainability.

Model Fit

	Saturated Model	Estimated Model
Chi-square	146.009	170.016
d_ULS	1.246	1.360
NFI	0.817	0.787
d_G	0.347	0.396
SRMR	0.085	0.089

(Source: Primary Data Analysis using Smart PLS S4)

The structural equation model in your study demonstrates a generally good fit, with the Chi-square values, degrees of freedom metrics (d_ULS and d_G), and SRMR indicating a reasonable balance between model complexity and goodness of fit. While the NFI for the Estimated Model is slightly lower than the Saturated Model, it still falls within an acceptable range, showcasing a solid overall fit. The relatively close values of degrees of freedom suggest that the model is appropriately constrained without sacrificing fit. These findings affirm the suitability of the model in capturing the relationships among variables in the agricultural context studied, providing a foundation for meaningful analysis and interpretation of the factors influencing farmers' perceptions of input costs and returns on investment in Mandya, Karnataka.

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Recommendations

Based on the findings of the study on farmers' perceptions of the impact of Cost on Inputs on agricultural produce and return on investment, the following policy recommendations are proposed:

Tailored Extension Services: Develop customized agricultural extension services that consider the diverse demographic profiles of farmers. These services should be designed to provide targeted information and support based on factors such as gender, age, marital status, and monthly purchase frequency.

Financial Literacy Programs: Implement financial literacy programs targeted at farmers to enhance their understanding of Cost on Inputs and financial management. These programs should be accessible and inclusive, catering to farmers with varying levels of education and experience.

Risk Mitigation Strategies: Recognize the significant association between risk perception and overall perception among farmers. Develop and promote risk mitigation strategies that address farmers' concerns and uncertainties, fostering a more resilient agricultural sector.

Subsidies and Incentives: Introduce targeted subsidies or incentives for specific Cost on Inputs identified as crucial factors influencing farmers' perceptions. This could include financial support for investments in seeds, labour, and transportation, aligning with the priorities and concerns of the farming community.

Capacity Building for Sustainable Practices: Implement capacity-building programs focused on sustainable agricultural practices. Emphasize the long-term benefits of environmentally friendly and resource-efficient farming methods, aligning with farmers' perceptions and concerns about the future of agriculture.

Collaborative Research and Development: Encourage collaborative research initiatives involving farmers, researchers, and industry stakeholders. This collaborative approach can lead to the development of innovative solutions and technologies that address the specific challenges faced by farmers in different demographic groups.

Communication and Information Dissemination: Strengthen communication channels to disseminate relevant information on agricultural best practices, market trends, and government policies. Ensure that information is presented in a clear and accessible manner to reach a wide range of farmers.

Support for Smallholder Farmers: Implement targeted support programs for smallholder farmers, recognizing their unique challenges and contributions to the agricultural sector. This may include access to credit, technology, and markets to enhance their overall productivity and profitability.

Flexibility in Agricultural Policies: Design agricultural policies with flexibility to accommodate the diverse needs and preferences of farmers. A one-size-fits-all approach may not be effective, so policies should be adaptable to different contexts and regional variations.

Continuous Monitoring and Evaluation: Establish a system for continuous monitoring and evaluation of the impact of implemented policies. Regular assessments will enable policymakers to refine strategies based on emerging trends and changing perceptions within the agricultural community.

By incorporating these policy recommendations, policymakers can contribute to the development of a more sustainable, inclusive, and resilient agricultural sector that aligns with the perceptions and priorities of farmers.

Conclusions:

In conclusion, the study on farmers' perceptions of the impact of Cost on Inputs on agricultural produce and return on investment yields several noteworthy findings. The analysis, conducted through SPSS, has unveiled significant associations between demographic factors, such as gender, age, marital status, and monthly purchase frequency, and farmers' overall perceptions. These results suggest that individual characteristics play a crucial role in shaping how farmers perceive the impact of costs and returns in agriculture. Moreover, the study highlights the importance of considering diverse demographic profiles when formulating policies or interventions aimed at optimizing agricultural practices.

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Furthermore, the investigation into specific Cost on Inputs, including investment in seeds, labour costs, transportation expenses, and additional costs for increasing the volume of produce, indicates that farmers' perceptions of these factors are closely tied to their overall outlook on agricultural profitability. The significant associations underscore the need for targeted strategies that address the nuanced views farmers hold regarding different aspects of Cost on Inputs. Policymakers, agricultural extension services, and industry stakeholders can leverage these insights to tailor interventions that resonate with the diverse perspectives within the farming community.

Overall, this study provides a valuable contribution to the understanding of farmers' perceptions in the context of agricultural production. The nuanced insights gained from the analysis offer a foundation for informed decision-making and the development of policies that consider the diverse needs and perspectives of farmers. As the agricultural sector continues to evolve, incorporating these findings into future initiatives may foster more sustainable and equitable practices, ultimately benefiting both farmers and the broader agricultural community.

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