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# Assessing the Impact of Agricultural Information Literacy on the Socioeconomic Development of Mango Growers

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## ABSTRACT

*To determine how agricultural information literacy affects the socioeconomic growth of mango producers, this research was conducted in West Bengal's Malda District. We used a pre-tested questionnaire, a semi-structured interview schedule, and an open conversation strategy to gather data from 150 mango producers. To determine the entire area under mango cultivation, we employed a simple random sample method without replacement. To determine the socioeconomic conditions of the producers, we used descriptive statistics to examine and tabulate the obtained data. To identify the factors affecting mango production in the research region, we employed multiple regression analysis. The results provide light on how mango farmers' socioeconomic growth is impacted by their productivity and way of life, as a result of their access to and use of agricultural information.*

**KEYWORDS:** Family, Socioeconomic, Agricultural, Farming.

## I INTRODUCTION

In many developing nations, agriculture has always played a crucial role in providing food security, rural livelihoods, jobs, and trade. Mango production in particular shows great social and economic potential within this expansive industry. The "king of fruits," mango, is grown extensively in subtropical and tropical areas, where it greatly enhances family income, nutritional status, and foreign currency earnings. Nevertheless, growers' insufficient knowledge, a dearth of up-to-date agricultural information, and a lack of literacy skills all work against mango cultivation's full potential. Consequently, farmers are unable to make informed decisions based on the best available information. The capacity of farmers to locate, retrieve, assess, and use agricultural data from various sources—a skill commonly referred to as "agricultural information literacy"—has thus become a crucial resource for elevating conventional subsistence farming to the level of an economically viable, marketable, and environmentally responsible enterprise. Mango farmers who are literate have a leg up when it comes to managing their crops, preventing pests and diseases, managing soil fertility, watering their crops, processing them after harvest, adding value to their mangoes, selling them, and staying informed about government policies. Income, employment, poverty reduction, family food security, education of children, gender inclusion, rural empowerment, and technical

agricultural techniques are just a few of the many socio-economic development indicators that may be impacted by this literacy. Mango farmers' competitiveness, resilience, and ability to respond to market and environmental changes are determined by their access to and use of trustworthy agricultural information, which is becoming more important in knowledge-driven agricultural value chains as globalization develops. Therefore, it is crucial to study how agricultural information literacy affects mango producers' socioeconomic development. This will shed light on how knowledge availability and usage lead to concrete developmental effects.

A farmer's income and standard of living can be improved through the adoption of improved technologies, the use of credit and financial services, the establishment of links with extension agents, and the ability to negotiate effectively in both domestic and international markets, according to studies.
On the other side, farmers who struggle with literacy frequently find themselves mired in a never-ending loop of poor production, intermediary exploitation, and exposure to climate change and market price fluctuations, among other external shocks. Literacy in agriculture determines mango growers' capacity to make educated decisions, diversify livelihood options, decrease production risks, and increase participation in the value chain; hence, agricultural information literacy is inseparable from mango growers' socio-economic development. For example, farmers may cut down on post-harvest losses by reading and interpreting weather predictions to better arrange planting and harvesting dates. In a similar vein, having knowledge of market pricing allows individuals to negotiate better deals or look into other marketplaces, which immediately boosts family income. In a larger sense, it is essential for rural development in the long run that mango growers have better access to agricultural information. This will strengthen community cohesion through increased cooperative action, better social networks, and more inclusive involvement of women and youth in farming and marketing.

Furthermore, there has been a growing recognition among private sector interventions, NGOs, and government programs in agricultural extension and information dissemination of the significance of enhancing farmers' information literacy abilities as a means to achieve sustainable development. Because mangoes are a perishable crop that need expertise in post-harvest management and access to markets, farmers who are literate in agricultural information are not only at a competitive advantage, but essential to their livelihood in today's agribusiness world. Farmers who have the knowledge to take advantage of the increasing demand for mangoes on both the local and global markets face a double whammy: they are unable to break out of rural poverty because they lack the abilities to acquire and use agricultural information. Studying how agricultural information literacy affects mango growers' socio-economic development can help researchers, policymakers, and development practitioners better understand the connections between knowledge, productivity, and welfare. This, in turn, can lead to the development of more effective interventions that farmers can use to their advantage. Data is just as important as land, labor, and money when it comes to deciding how successful an agricultural enterprise is, and this evaluation adds to the larger conversation about rural development and agricultural modernization.

Mango farmers who are well-versed in the information age are better positioned to innovate, implement climate-smart practices, practice sustainable agriculture, and seek out new sources of income in the face of mounting threats to agricultural systems from things like climate change, resource loss, and unpredictable markets. This has a multiplicative effect, improving their own socioeconomic status while also aiding the country's efforts to eradicate poverty, provide food security, diversify its economy, and protect the environment. The ability to effectively use

 

agricultural information literacy allows mango producers to actively engage in knowledge economies and value chains that were previously out of reach, effectively connecting traditional knowledge systems with current scientific developments. As a result, learning from its results may provide light on how support for information literacy might improve rural communities, hasten inclusive development, and change the lives of mango farmers. Recent developments in mobile technology, digital platforms, and innovative extension services highlight the relevance of this study. While these tools increase farmers' access to information, they also require a specific level of literacy to use them effectively.

Smallholder mango producers may become even more marginalized due to the digital gap if capacity-building initiatives are not implemented. This would restrict their ability to participate in the new knowledge-driven agricultural environment. Because educated farmers have the power to affect economic and social change on a local and national scale, studying the function of agricultural information literacy is crucial. The overarching goal of this research is to help make agricultural information literacy a central tenet of rural development policy and practice by shedding light on the ways in which it affects mango growers' productivity, income, market participation, and socioeconomic development as a whole.

## II REVIEW OF LITERATURE

Spielman, David et al., (2021) Many new products, services, and programs have emerged as a result of developments in information and communication technology, which have reignited the possibility of agricultural extension in developing countries. Truthfully, there is growing evidence that demonstrates not all extension approaches enabled by ICT are equally effective in increasing adoption, productivity, revenue, or welfare outcomes. Several conceptual and methodological issues are highlighted in our literature review on ICT-enabled extension in developing countries. Focusing on how ICTs influence spillovers, incentives for public workers, gender and intrahousehold dynamics, and decision and behavior, we examine the role of various impact pathways. We also look at how communication technology-enabled extension could improve the methodological rigor of extended outcome identification. Future research on extension made possible by ICT should follow these theoretical and methodological guidelines, as well as those of earlier studies, in order to inform policy.

Skaalsveen, Kamilla et al., (2020) This study employs a Social Network Analysis, based on network science, to get a deeper understanding of the ways in which the implementation of no-till in England affects farmers' social networks. Little no-till farming is happening in Europe, even though it could be good for the soil, water, and farmers' bottom lines. The social networks that farmers are a part of have a significant impact on how they learn and make decisions. Farmers often consult one another while seeking knowledge. Finding out what variables impact no-till adoption among English farmers was the goal of this research, which used social network mapping and semi-structured interviews. Fifteen no-till farmers took part in the research. We were also interested in finding out how farmer networks changed over time and space, and what kinds of information were transferred there. We found that the no-till farmer network's communication and information exchange were greatly enhanced by intermediary farmers. These intermediaries had the greatest sway because other farmers sought their counsel; they also had the most first-hand experience, as they were frequently no-till farmers. Dispersed no-till farmer networks were the result of members' preference for communicating with other no-till farmers rather than with conventional farmers in their immediate area who did not share their philosophy. As a result, people's reliance on online platforms like social

 

media and messaging apps grew paramount. Based on our findings, conventional extension programs may not be the best way to encourage farmers to use no-till and other innovative practices. Instead, advisors should make an effort to comprehend these complex communication networks in order to spread information more effectively.

T., Damodaran et al., (2019) The catastrophic wilt disease outbreak caused by Fusarium oxysporum f.sp. cubense Tropical race 4 (Foc TR-4) has drastically reduced the profitability of farming commercial G-9 bananas in banana-growing countries. Banana production has essentially come to a standstill in certain regions. Chemical, resistance breeding, and biological approaches to managing this virus have not been successful due to its high contagiousness and polycyclic nature. The whole nation was threatened by an epidemic in the U.P. district of Ayodhya in 2017 and the Bihar district of Katihar in 2018, thus researchers in India set out to find a way to limit the Foc TR-4 virus. In the focal point areas of Foc TR-4, "ICAR-FUSICONT" was built and tested using community-based participatory management. On a modified and patented CSR-BIO medium, the bio-formulation includes both growth-promoting and antagonistic bacteria. The goal of this research is to find out how well the bio-formulation helps banana farmers in hotspot areas manage diseases, restore output, and increase profits. Researchers used a descriptive survey approach to gather data from people who used and didn't utilize the technology in 2017 and 2018. There was a significant decrease in disease incidence in Bihar and Uttar Pradesh after the establishment of community-based organizations and the application of the ICAR-FUSICONT bio-formulation throughout the critical stages of crop growth. While 45.68 percent of those who did not adopt were afflicted by harvest-time sickness, 6.08 percent of those who did were. While adopters averaged 182949.40 rupees per acre, non-adopters averaged 39917.04 rupees and yielded 11.12 kg per plant. The majority of adopters, according to the survey, were in their 30s and 40s and had completed high school or above. This study's findings contribute to the mounting evidence that ICAR-FUSICONT must use community-enabled technology to control banana Fusarium wilt (Foc TR-4) in regions experiencing disease outbreaks.

Sirisha, B. et al., (2016) Indian farmers are the real deal when it concerns the country's economy. But now things are different because—due to their ignorance and lack of knowledge about modern agricultural farming practices and technology—farmers' performance and production have fallen more than expected. Most Indian farmers don't have the training to keep up with the ever-shifting agricultural scene, which cuts into their harvests. Because of their poor levels of knowledge and training, many farmers are unable to verify the legitimacy of their seeds or evaluate the competitive landscape of various agri-inputs, including seed. Only a tiny fraction of the educated populace has been making advantage of the government subsidies and programs that are offered to farmers. Consequently, the purpose of this study is to investigate whether or not farmers' choices to buy seed and other agricultural inputs are influenced by their degree of literacy. The hamlet of Nallapadu in the Indian state of Andhra Pradesh is the site of the 200-person sample used in this study. We utilize Kruskal's Gamma Method to examine the findings. The results show that farmers' literacy levels affect their choices when buying agri-inputs (seed).

## III RESEARCH METHODOLOGY

The Malda District in West Bengal is the site of the current investigation. The research study's goals informed the development of the questionnaire and timetable for data collection.

Based on the total area under mango production, a simple random selection without replacement approach was used to a list of 150 mango producers from the community.

To gather information, we utilized a combination of a pilot survey, semi-structured interviews, and an open discussion format. The study's goals were attained by carefully reviewing, tabulating, and analyzing the data obtained from mango producers using a variety of analytical methods. The socio-economic condition of the farmers has been assessed using descriptive analysis. The factors that influence mango production in the research region have been examined by fitting the multiple regression function. We hypothesize the following regression function form as

$$Y= â0+ â1 X1+â2 X2+ â3 X3+ â4 X4+â5 X5+ â6 X6+ â7 X7+ â8 X8 + Ui$$

were,

Y = Yield of mango (Quintal ha-1)

X1 = Experience in mango farming (Year)

X2 = Planting material (Cutting =1 Seedling=0)

X3 = Age of orchard (Year)

X4 = Planting density (No. of plant ha-1)

X5 = Number of bearing trees in a orchard (Number)

X6 = Number of labour engagement (No. ha-1)

X7 = Application of fertilizer and plant protection chemical (Kg ha-1)

X8 = Share of orchard income in total farm income (per cent)â0, â1, â2, â3, â4, â5, â6, â7, â8 are unknown parameters (constants to be estimated from the data)

Ui = Vector of random disturbance term

## IV DATA ANALYSIS AND INTERPRETATION

One way to look at farmers' socio-economic status is as a composite indicator of their relative social and economic standing in society. You can see the outcomes of all these factors in the tables below.

**Demographic profile of the respondets**

***Gender***

**Table 1:** Gender of the respondents

| Particular | Frequency | Percentage% |
|---|---|---|
| Male | 77 | 51.3% |
| Female | 73 | 48.7% |
| **Total** | **150** | **100%** |

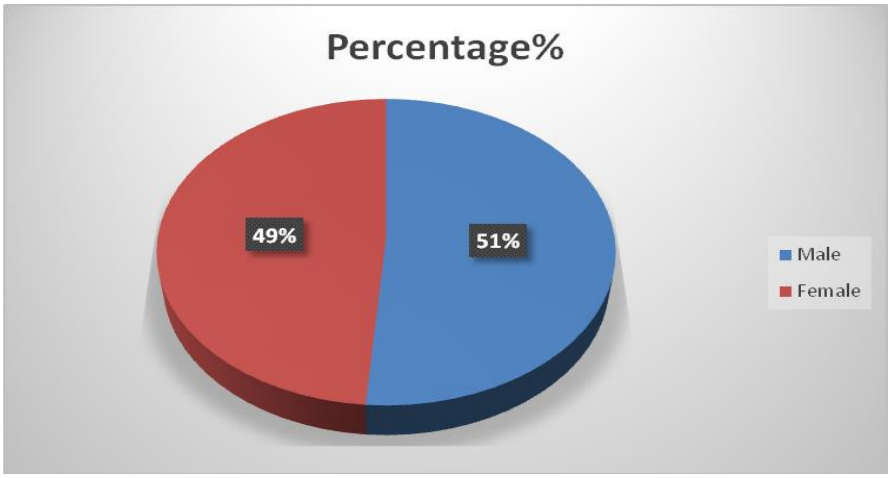


**Figure 1:** Gender of the respondents

Table 1 displays the breakdown of the 150 responders by gender. There were 77 male respondents (51.3% of the total) and 73 female responders (48.7% of the total). This suggests that there is a little male preponderance in the sample, but overall, the gender distribution is balanced. The study's highly equal distribution decreases the potential of bias stemming from gender imbalance, suggesting that the opinions gathered are inclusive of both genders. The results are more reliable with this distribution since it effectively represents male and female customer behaviors, tastes, and insights.

***Age***

**Table 2:** Age of the respondents

| Particular | Frequency | Percentage% |
|---|---|---|
| 20 to 38 | 63 | 42.0% |
| 38 to 52 | 51 | 34.0% |
| above 52 | 36 | 24.0% |
| **Total** | **150** | **100**% |

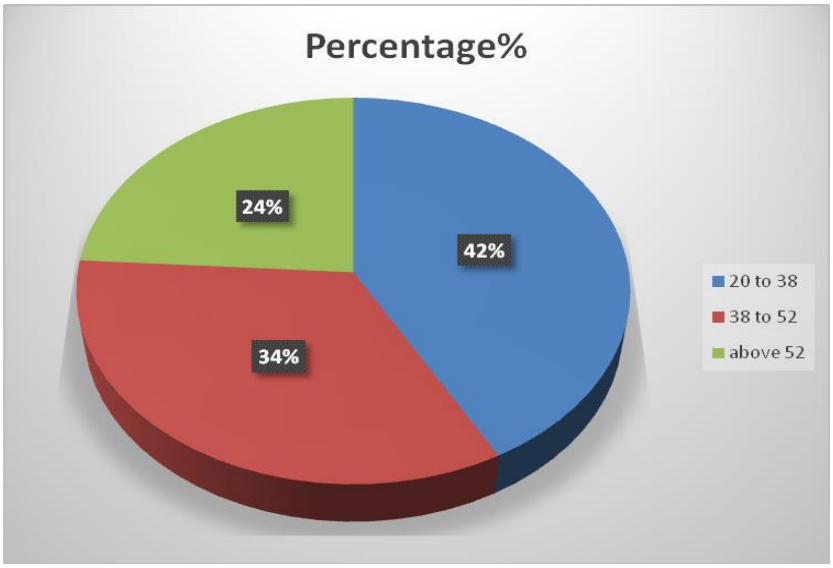


**Figure 2:** Age of the respondents

The respondents' ages are shown in Table 2. Of the total respondents, 63 (or 42% of the total) are between the ages of 20 and 38, suggesting that a significant proportion of the sample consists of young and middle-aged individuals, who are often influential buyers and sellers. A substantial portion of the respondents, 51 in total (34%), fall within the age bracket of 38 to 52, indicating that they are mostly middle-aged. People in this age bracket tend to have steady incomes and regular spending habits. The opinions of senior customers are reflected by the 36 respondents, or 24%, who are 52 and above. With a somewhat larger number of younger respondents, this distribution emphasizes that the research gathers perspectives from a variety of age groups. This might guarantee that older age groups are included while still providing useful information on younger demography' consumption habits.

***Education***

**Table 3:** Education of the respondents

| Particular | Frequency | Percentage% |
|---|---|---|
| 0-5 standard | 21 | 14.0% |
| Up to 5-8 standard | 27 | 18.0% |
| Up to 10 standards | 33 | 22.0% |
| Up to 12 standards | 29 | 19.3% |
| College/varsity education | 40 | 26.7% |
| **Total** | **150** | **100**% |

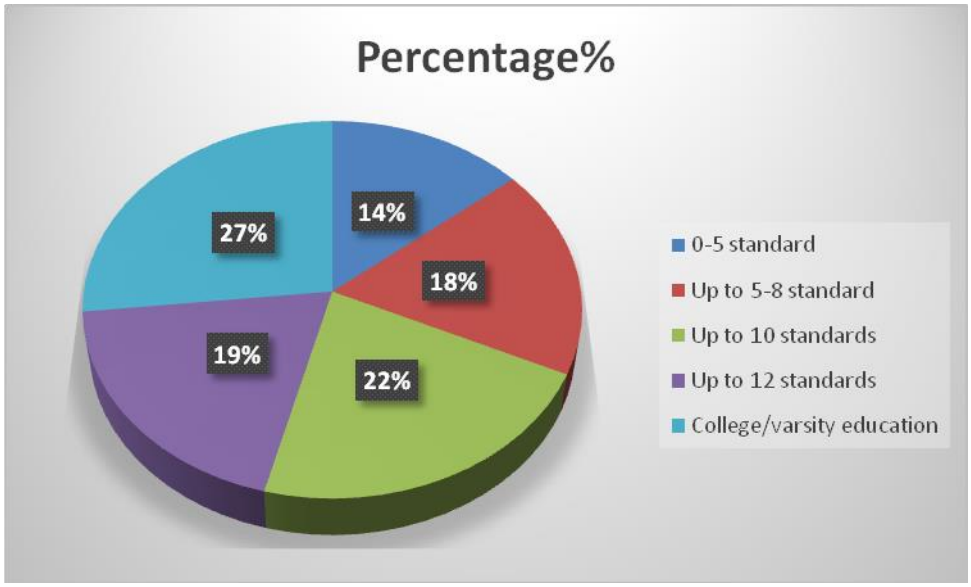


**Figure 3:** Education of the respondent

The respondents' educational backgrounds are detailed in Table 3. Forty people (or 26.7% of the total) have completed some kind of postsecondary education, according to the findings. After that, 33 people (22%) who only went as far as the 10th standard and 29 people (19.3%) who went all the way to the 12th standard finished their education. The smaller group consists of 27 people who were educated up to the 5th-8th standard (18%), 21 people who were educated up to the 0-5 level (14%), and so on. According to the results, there is a wide range of educational backgrounds represented in the sample, with a greater percentage of people having completed postsecondary education. The distribution depicts a range of literacy levels, guaranteeing that the collected insights include the viewpoints of both consumer groups with lower and higher levels of education. College graduates make

 

up a disproportionate share of respondents, which may indicate that many of them are more up-to-date on consumer trends, decision-making processes, and digital platform exposure, all of which might impact their purchasing habits.

***Family- size***

**Table 4:** Family size of the respondents

| Particular | Frequency | Percentage% |
|---|---|---|
| 4-8 member | 111 | 74.0% |
| > 8 members | 39 | 26.0% |
| Total | 150 | 100 |

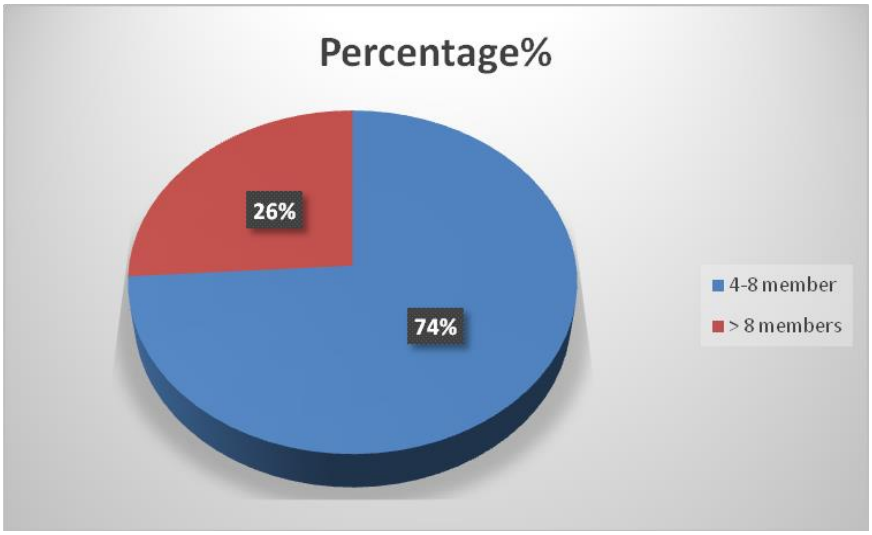


**Figure 4:** Family size of the respondents

The spread of respondent family sizes in Table 4. One hundred and ten people (or 74% of the total) said they belonged to households with four to eight members. This indicates that the sample mostly consists of nuclear and somewhat extended families. Larger, joint-family arrangements are still common in certain cultural and societal situations; 39 respondents (26%) said their families had more than 8 people.Most respondents live in medium-sized homes, according to the statistics, which can affect their spending habits, decision-making abilities, and buying power. Although less in percentage, households with more than eight people may shop differently, favoring necessities over luxuries or buying in bulk. To fully grasp the impact of households on marketing and consumption, it is important to include both types of consumers in the sample. This will help researchers understand consumer behavior across various family arrangements.

See Table 2 for the multiple regression model's output.

**Table 5:** Estimated value of coefficients and their level of significance of determinants influencing the mango yield

| Variables | Coefficients | Standard error | t Stat | P-value | 95% confidence interval Lower 95% | Upper 95% |
|---|---|---|---|---|---|---|
| Intercept | 1.911 | 0.701 | 2.725 | 0.007 | 0.528 | 3.294 |
| X1 | -0.019 | 0.012 | -1.537 | 0.126 | -0.043 | 0.005 |
| X2 | -1.141*** | 0.218 | -5.233 | 0.000 | -1.571 | -0.711 |
| X3 | 0.022** | 0.011 | 1.960 | 0.051 | 0.000 | 0.044 |

| | | | | | | |
|---|---|---|---|---|---|---|
| X4 | 0.023 | 0.015 | 1.543 | 0.124 | -0.007 | 0.053 |
| X5 | 0.124*** | 0.015 | 8.074 | 0.000 | 0.094 | 0.155 |
| X6 | 0.036*** | 0.012 | 3.070 | 0.002 | 0.000 | 0.086 |
| X7 | 0.000 | 0.000 | -0.188 | 0.851 | 0.000 | 0.000 |
| X8 | 0.158*** | 0.059 | 2.665 | 0.008 | 0.275 | 0.041 |
| R-Square = 0.9415, Adjusted R-Square = 0.9413 | | | F value =7956.83, df = 8 | | | |

A high R-Square value of 0.9415 and an Adjusted R-Square value of 0.9413 show that the independent variables in the regression model have a significant explanatory power, explaining almost 94% of the variance in the dependent variable. The overall statistical significance of the model is confirmed by the F-statistic (7956.83, $p < 0.001$), which implies that the outcome variable is strongly influenced by the predictors when they are considered together.

Coefficient by coefficient analysis reveals a statistically significant intercept (1.911, $p = 0.007$), which, in the absence of any predictors, indicates that the dependent variable has a positive baseline value. X2 (-1.141, $p < 0.001$) stands out among the explanatory factors as it has a very significant negative relationship with the dependent variable. This indicates that a rise in X2 causes a large drop in the result. To the contrary, X5 (0.124, $p < 0.001$) and X6 (0.036, $p = 0.002$) are highly significant predictors that are positive, suggesting that they have a favorable impact on the dependent variable.

The positive and statistically significant X8 (0.158, $p = 0.008$) also indicates a substantial influence. At the 5% level of significance, X3 (0.022, $p = 0.051$) indicates a modest but positive correlation. In this model, the effects of X1 (-0.019, $p = 0.126$), X4 (0.023, $p = 0.124$), and X7 (0.000, $p = 0.851$) on the dependent variable are minimal, as they are not statistically significant. The findings indicate that some factors have a substantial and significant impact on the dependent variable, such as X2, X5, X6, and X8, whereas others, such X1, X4, and X7, do not. In order to improve the model's parsimony, it may be necessary to remove or re-examine the minor predictors, but the high R-Square value shows that the model is resilient and dependable in predicting customer or behavioral fluctuations.

## CONCLUSION

The importance of having access to and being able to effectively use agricultural knowledge in improving rural lives is shown by the research that evaluated the influence of agricultural information literacy on the socioeconomic development of mango producers. The results show that mango farmers who are more literate in the area are better able to use contemporary agricultural techniques, control pests, use inputs wisely, and increase their crop's production and profit. Farmers that are better able to understand and use information have a leg up when it comes to negotiating prices, obtaining access to loans and extension services, and improving the efficiency and inventiveness of mango farming. Thus, this plays a major role in boosting family earnings, living standards, and community development. But there are still holes when it comes to fair access to agricultural data, especially for smallholder and resource-poor farmers. To further enhance the socioeconomic effect of mango farming, it is necessary to address these gaps using digital technology, enhanced extension services, and focused training programs. Finally, the ability to effectively use agricultural information literacy becomes clear as a critical component of sustainable development, enabling mango farmers to transcend subsistence and achieve resilience, competitiveness, and economic empowerment in the long run.

 

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