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The names and affiliations of all authors are provided below, following the references.

Major customer relationship management practices and their association with customer satisfaction in agribusiness: An empirical study from Baramati, Maharashtra

Gautam Gajanan Jadhao¹, MS Pisal², AA Gadhave³, PA Shitole⁴, PS Deokate⁵, RB Shinde⁶, AD Bhoite⁷, Pavan Tambe⁸, Krishana⁹, Aniket¹⁰, Audumber¹¹, Hrushikesh¹², Pawan¹³

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ABSTRACT

Customer relationship management has become increasingly important in agribusiness because agricultural customers require continuous communication, technical guidance, problem-solving support and post-purchase assistance. The present study was conducted to identify the major customer relationship management practices used by agribusiness firms and to examine their relationship with customer satisfaction in Baramati Taluka of Pune District, Maharashtra. The study followed a descriptive and analytical research design. Primary data were collected from 130 respondents comprising 90 farmers and 40 agribusiness dealers and retailers through structured questionnaires. A five-point Likert scale was used to measure respondents' perceptions. Mean, standard deviation and ranking were used to identify the major customer relationship management practices, while Pearson correlation and simple linear regression were used to examine the relationship between customer relationship management practices and customer satisfaction. Among farmers, providing appropriate solutions to pest and disease problems recorded the highest mean score of 3.56, followed by timely information about new agricultural products and technology with a mean score of 3.44. Complaint handling and problem-solving support recorded a mean of 3.43, while post-purchase follow-up recorded 3.32. Among dealers and retailers, complaint handling and problem-solving support received the highest mean score of 3.77, followed by technical guidance to farmers with 3.70. The regression analysis among farmers showed a strong positive association between customer relationship management practices and customer satisfaction, with a Multiple R of 0.94717 and coefficient of determination of 0.89714. The regression coefficient was 0.72996 and was statistically significant at $p < 0.001$. The findings indicated that practical technical support, timely information, effective complaint handling and problem-solving were important components of customer relationship management in rural agribusiness.

Keywords: Customer relationship management, Agribusiness, Customer satisfaction, Farmers, Technical guidance, Rural markets

1. Introduction

1.1 Background

Agriculture is embedded within a wider agribusiness system in which farmers interact with input manufacturers, distributors, dealers, retailers and service providers. These relationships are not limited to the physical exchange of agricultural products. Farmers frequently require information on new products, guidance on product use, solutions to crop-related problems, clarification of complaints and support after purchase. The thesis therefore treated customer relationship management as an important component of rural agribusiness interaction.

Customer relationship management is generally concerned with developing, maintaining and evaluating relationships between an organization and its customers. The strategic framework proposed by Payne and Frow described customer relationship management as a cross-functional process involving strategy development, value creation, multichannel integration, information management and performance assessment.^[1] This framework is relevant to agribusiness because the customer relationship often involves several organizational and market actors.

Agricultural markets have characteristics that distinguish them from many conventional consumer markets. Demand for agricultural inputs is influenced by cropping seasons, weather, pest and disease incidence, pro

Corresponding Author:
Gautam Gajanan Jadhao
Research Scholar,
Department of
Agribusiness Management;
Division of Statistics, Dr.
Sharadchandra Pawar
College of MBA (Agri.),
Baramati, Mahatma Phule
Krishi Vidyapeeth, Rahuri,
Maharashtra, India.

duction decisions and local market conditions. The information requirement of a farmer may therefore change rapidly during the crop cycle. In this setting, the quality and timeliness of information and technical support may form an important part of the customer experience.

The thesis identified timely information, technical guidance, pest and disease solutions, complaint handling, problem-solving support and post-purchase follow-up as major relationship-management activities. It also considered the growing use of mobile communication, digital payments, digital billing and other digital interaction mechanisms in rural agribusiness.

1.2 Customer relationships in agribusiness

Dealers and retailers occupy an important position between agribusiness firms and farmers. They may communicate information supplied by companies, facilitate the sale of agricultural inputs and provide first-level assistance when farmers face product or crop-related difficulties. Consequently, customer relationship management can operate simultaneously at the company, intermediary and farmer levels.

The thesis included both farmers and dealers and retailers so that relationship-management practices could be considered from end-user and intermediary perspectives. This dual perspective was particularly relevant to the first objective, while the second objective examined the statistical relationship between customer relationship management practices and customer satisfaction among farmers.

1.3 Customer satisfaction

Customer satisfaction represents the customer's evaluation of the service or experience received. In agribusiness, satisfaction may depend on several aspects of the interaction, including the availability of agricultural products, clarity of information, technical guidance, responsiveness to complaints and support after purchase. The thesis measured customer satisfaction using a perception statement on a five-point Likert scale and reported an overall mean score of 3.48 among the surveyed farmers.

The relationship between customer relationship management and satisfaction has been discussed in relationship-marketing literature. Morgan and Hunt emphasized trust, commitment and communication as foundations of successful relationship marketing.^[2] Garbarino and Johnson examined satisfaction, trust and commitment and showed that customer evaluations of relationship experiences have an important role in relationship outcomes. (Garbarino *et al.*, 1999)^[3] These perspectives provided a conceptual basis for examining customer relationship management as an explanatory variable for customer satisfaction.

1.4 Need for the study

The changing nature of agribusiness markets has increased the importance of maintaining effective relationships with customers. Product availability alone may not be sufficient when farmers also require technical information, timely advice and assistance with production problems. The thesis highlighted that customers increasingly expect information, technical guidance, responsive communication, complaint handling and post-purchase support.

The study was also relevant because rural agribusiness relationships involve both direct and intermediary interactions. Farmers interact with dealers and retailers while agribusiness firms depend on channel partners to communicate products and services. Understanding how these groups perceive relationship-management activities can provide a more complete view of customer relationships in the local agribusiness system.

1.5 Scope and limitations

The study was geographically restricted to Baramati Taluka of Pune District, Maharashtra. It covered 90 farmers and 40 dealers and retailers. The thesis stated that purposive and convenience sampling were used. Because the sampling was non-probability based, the findings were intended to be interpreted primarily within the selected study

area and sample rather than as statistically representative of all farmers and agribusiness dealers and retailers in Maharashtra.

The study was also based on respondent perceptions and therefore reflected the experiences reported during the period of data collection. Customer relationships and technology use can change over time. These limitations were considered while interpreting the empirical results.

2. Review of Literature

2.1 Major customer relationship management practices

Payne and Frow presented a strategic framework for customer relationship management and emphasized strategy development, value creation, multichannel integration, information management and performance assessment as interconnected processes.^[1] The framework provided a conceptual foundation for considering customer relationship management as a broad organizational activity rather than a single sales or communication function.

Torres Jr. and colleagues evaluated customer relationship management practices among agribusiness firms and identified structured customer relationship processes, customer-oriented organizational practices, customer interaction, information management and organizational commitment as relevant components of effective customer relationship management. (Torres Jr *et al.*, 2007)^[4] Their agribusiness-specific work provided an important basis for examining communication, service delivery and relationship-oriented practices in agricultural markets.

Milovic examined the application of customer relationship management in agriculture and emphasized the role of information technology in improving communication and responsiveness between agricultural businesses and customers.^[5] The work indicated that customer databases, internet platforms, electronic communication and mobile applications could complement traditional relationship-building activities.

Stuchly and colleagues discussed customer relationship management and business competitiveness and emphasized continuous monitoring of customer value, satisfaction and purchasing behaviour. (Stuchly *et al.*, 2020)^[6] Their perspective supported the view that relationship management should be treated as a continuing business process rather than only a technological activity.

Rizki, Sujoko and Wening examined the implementation of customer relationship management in an agribusiness enterprise and provided an agribusiness-specific perspective on relationship management practices. (Rizki *et al.*, 2024)^[7] Bisht discussed the evolution and application of customer relationship management and identified customer satisfaction, customer retention, operational efficiency and revenue generation as relevant outcomes while also noting implementation challenges. (Bisht, 2025)^[8]

2.2 Relevance to the present study

The reviewed studies indicated that customer communication, information sharing, technical support, responsiveness and systematic relationship processes are relevant dimensions of customer relationship management. These themes were consistent with the practices examined in the present study, particularly timely information, technical guidance, problem solving, complaint handling and post-purchase follow-up.

2.3 Customer relationship management and customer satisfaction

Morgan and Hunt proposed the commitment-trust theory of relationship marketing and emphasized the role of trust and commitment in developing successful relationships.^[2] In the agribusiness setting, regular communication, reliable technical guidance and effective problem resolution can be viewed as relationship activities that support confidence in the service provider.

Garbarino and Johnson examined the different roles of satisfaction, trust and commitment in customer relationships. (Garbarino *et al.*, 1999)^[3] Their work is relevant to the present study because customer

satisfaction was considered an important outcome of customer relationship experiences.

Shaon and Rahman reviewed the effects of customer relationship management on customer satisfaction and loyalty and highlighted service quality, communication and responsiveness as important mechanisms through which customer relationship management can improve customer experiences. (Shaon *et al.*, 2015) [9] Their review provided direct conceptual support for examining customer relationship management practices in relation to satisfaction.

Algamdi and colleagues examined customer relationship management systems and customer loyalty trends with emphasis on customer engagement. Their work highlighted communication, personalization and interactive relationships as relevant elements of relationship outcomes. (Algamdi *et al.*, 2021) [10] Goranda, Nurhayati and Simanjuntak examined customer satisfaction and loyalty using a customer relationship management approach in an agribusiness e-commerce company and reported positive relationships among customer relationship management, satisfaction and loyalty. (Goranda *et al.*, 2021) [11]

Suarniki and Daud examined customer relationship management strategies for increasing consumer loyalty through personalization and interaction and reported the importance of understanding customer needs and maintaining customer interaction. (Suarniki *et al.*, 2024) [12] Mansoor and colleagues examined digital competence and relationship-building skills in relation to customer satisfaction and loyalty and highlighted the importance of employee capabilities and customer engagement. [13]

2.4 Research gap

The thesis identified a need for empirical examination of customer relationship management specifically within rural agribusiness because agricultural markets involve seasonality, technical product requirements, geographically dispersed customers and dependence on intermediaries. The study therefore focused on farmers and dealers and retailers in Baramati and connected observed customer relationship management practices with customer satisfaction. The first two objectives of the thesis were designed to identify major practices and examine their statistical relationship with customer satisfaction.

3. Materials and methods

3.1 Research design

The study followed a descriptive and analytical research design. The descriptive component was used to describe respondents' perceptions and identify the relative importance of customer relationship management practices. The analytical component was used to examine relationships between the major variables.

For the first objective, mean scores, standard deviations and ranks were used to summarize the customer relationship management practices. For the second objective, Pearson correlation and simple linear regression were specified to examine the relationship between customer relationship management practices and customer satisfaction. The objective-wise analytical framework in the thesis directly linked each objective with its statistical technique.

3.2 Study area

The study was conducted in Baramati Taluka of Pune District, Maharashtra. The thesis selected Baramati because of its significant agricultural and agribusiness activity, diversified agricultural economy and established network of agricultural input dealers, retailers and service providers. The area also provided a relevant setting for examining interactions through both conventional and digital communication channels.

3.3 Population

The target population comprised two groups. Farmers were considered the principal end-users of agricultural inputs and related services. They interacted with dealers, retailers and company representatives

for product information and technical assistance. Agribusiness dealers and retailers were considered channel intermediaries because they facilitated product distribution, communicated product information and in many cases assisted farmers with technical guidance and problem solving.

3.4 Sampling

Purposive and convenience sampling were used. Purposive sampling was used to identify respondents relevant to the study objectives, particularly farmers purchasing agricultural inputs and dealers and retailers regularly interacting with farmers. Convenience sampling was used to approach respondents who were accessible and willing to participate.

A total of 130 respondents were included, consisting of 90 farmers and 40 agribusiness dealers and retailers. Farmers represented 69.23 per cent and dealers and retailers represented 30.77 per cent of the total sample.

3.5 Data collection

Primary data formed the main basis of the empirical analysis. Separate structured questionnaires were used for farmers and dealers and retailers. The questionnaires were administered through direct interaction and digital data collection using Google Forms. The questions were developed in accordance with the objectives and included statements related to customer relationship management practices and customer satisfaction.

Secondary information was used to provide conceptual and theoretical support. The thesis stated that books, research articles, journals, reports, previous studies, theses, government publications and other academic sources were consulted for conceptual development, literature review and interpretation.

3.6 Measurement scale

Perception statements were measured using a five-point Likert scale. The coding was 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree and 5 = Strongly Agree. The common scale allowed calculation and comparison of mean scores and standard deviations across customer relationship management statements.

3.7 Variables

Customer relationship management practices represented the principal independent variable for the second objective. The construct included customer-oriented activities such as timely communication, technical guidance, problem-solving support, complaint handling and postpurchase follow-up. Customer satisfaction represented the dependent variable for the second objective and reflected respondents' overall satisfaction with the service received.

3.8 Statistical analysis

Mean was used to determine the average response for each customer relationship management practice. Standard deviation was used to indicate the dispersion of responses around the mean. Rank was assigned according to the relative mean scores, with higher mean scores receiving higher priority.

Pearson's correlation coefficient was specified to determine the direction and strength of the linear relationship between customer relationship management practices and customer satisfaction. Simple linear regression was used to examine the statistical association between the independent and dependent variables. The model was expressed as Customer Satisfaction = $\beta_0 + \beta_1(\text{Customer Relationship Management Practices}) + \epsilon$.

The thesis reported Multiple R, R Square, Adjusted R Square, standard error, *F*-value, regression coefficient, standard error of the coefficient and *t*-value for the second objective. Statistical significance was assessed at the reported probability level.

4. Results

4.1 Major customer relationship management practices

The first objective was to identify the major customer relationship management practices used by agribusiness firms. Responses from 90 farmers and 40 dealers and retailers were analysed separately. The practices covered timely information, technical support, problem-solving assistance, complaint handling and post-purchase follow-up.

4.1.1 Farmers' perspective

Among the 90 farmers, providing appropriate solutions for pest and disease problems recorded the highest mean score of 3.56 with a standard deviation of 1.08 and ranked first. Timely information about new agricultural products and technology recorded a mean of 3.44 with a standard deviation of 1.19 and ranked second.

Complaint handling and problem-solving support recorded a mean score of 3.43 with a standard deviation of 1.22 and ranked third. Post-purchase follow-up recorded the lowest mean score of 3.32 with a standard deviation of 1.25 and ranked fourth.

The results showed that the farmers placed relatively greater importance on practical technical support and assistance with production-related problems. Timely information also received a relatively high score, indicating the importance of communication concerning agricultural products and technology. Complaint handling and problem solving also formed an important component of the relationship because farmers may require responsive assistance when they face difficulties.

Although post-purchase follow-up ranked fourth, its mean score of 3.32 indicated that it remained a relevant component of customer relationship management. The ranking therefore reflected relative differences among the four practices rather than the absence of importance of the lower-ranked practice.

4.1.2 Dealers' and retailers' perspective

The perceptions of 40 dealers and retailers were analysed separately. Complaint handling and problem-solving support recorded the highest mean score of 3.77 with a standard deviation of 1.27 and ranked first. Technical guidance to farmers recorded a mean of 3.70 with a standard deviation of 1.18 and ranked second.

Timely information through phone, WhatsApp and SMS recorded a mean score of 3.58 with a standard deviation of 1.11 and ranked third. Post-purchase follow-up also recorded a mean score of 3.58 with a standard deviation of 1.32 and shared the third rank.

The findings indicated that complaint resolution and problem-solving were particularly important from the intermediary perspective. Dealers and retailers interact directly with farmers and therefore may encounter customer concerns relating to products, service and technical requirements. The high mean score for complaint handling suggested that responsiveness to operational problems was a prominent relationship-management practice among channel intermediaries.

Technical guidance also received a high mean score. Dealers and retailers may function as an important communication link between agribusiness firms and farmers, making access to product related information and technical knowledge relevant to their role.

The equal mean scores for timely information through phone, WhatsApp and SMS and post purchase follow-up indicated that both communication and continuing engagement were relevant at the intermediary level. The result provided a complementary perspective to the farmer responses and showed that customer relationship management operated through several connected service activities.

4.1.3 Comparison of respondent groups

The farmer and intermediary responses showed a common emphasis on technical assistance and problem solving. Farmers gave the highest mean to solutions for pest and disease problems, whereas dealers and retailers gave the highest mean to complaint handling and problem-solving support. Both groups assigned relatively high scores to timely information and technical guidance. These findings indicated that cus-

tomers relationship management in the study area was closely associated with practical support and responsive communication.

4.1.4 Relative pattern of CRM practices

The relative ranking of practices showed that farmers' first-ranked practice was appropriate solutions for pest and disease problems, followed by timely information, complaint handling and post-purchase follow-up. The dealer and retailer ranking placed complaint handling first, technical guidance second and timely information and post-purchase follow-up jointly third.

The results suggested that the emphasis of customer relationship management differed according to the respondent's position in the agribusiness value chain. Farmers were directly concerned with crop production and therefore gave the highest relative score to solutions for pest and disease problems. Dealers and retailers were channel intermediaries and therefore placed the highest relative score on complaint handling and problem solving.

The results also demonstrated that customer relationship management was not represented by a single activity. Rather, it consisted of a set of connected practices involving information, technical guidance, problem solving, complaint resolution and follow-up. This pattern was consistent with the strategic view of customer relationship management described in the literature, where customer value and relationship processes involve several organizational activities rather than only direct selling [1, 4]

4.1.5 Summary

The first objective was achieved through mean, standard deviation and rank analysis. Among farmers, pest and disease problem solutions obtained the highest mean score of 3.56. Among dealers and retailers, complaint handling and problem-solving support obtained the highest mean score of 3.77. The findings showed that technical support, problem resolution and timely communication were prominent customer relationship management practices in the selected rural agribusiness market.

These descriptive results were based on the respondents included in the study and were interpreted as perceptions of the selected sample. They were not treated as estimates representing all agribusiness customers in Maharashtra.

4.2 Customer relationship management and customer satisfaction

The second objective examined how customer relationship management practices were associated with customer satisfaction. The analysis focused on the 90 farmers because the customer satisfaction measure and the reported regression analysis were based on farmer responses.

4.2.1 Descriptive customer satisfaction result

The overall customer satisfaction statement recorded a mean score of 3.48 on the five-point Likert scale. The statement assessed farmers' satisfaction with the service received as a result of good service and proper guidance. The result indicated a moderately positive level of customer satisfaction among the farmers surveyed.

The mean score suggested that respondents generally reported a favourable service experience, while the score remained below the upper end of the five-point scale. The thesis connected this result with the importance of service quality and appropriate guidance in the farmer's relationship with the agribusiness firm or shop.

4.2.2 Relationship between CRM practices and satisfaction

Regression analysis was conducted to statistically examine the relationship between customer relationship management practices and customer satisfaction. The model produced a Multiple R of 0.94717. The coefficient of determination was 0.89714 and the adjusted coefficient of determination was 0.89597.

The standard error of the model was 0.26298 and the *F*-value was 767.50. The reported significance level was $p < 0.001$. The regression

coefficient for customer relationship management practices was 0.72996, with a standard error of 0.02635 and a t -value of 27.7037.

The regression equation reported in the thesis was: Customer Satisfaction = $0.856 + 0.730(\text{Customer Relationship Management Practices})$. The positive coefficient indicated that higher customer relationship management practice scores were associated with higher customer satisfaction scores in the sample.

4.2.3 Interpretation of regression results

The Multiple R value of 0.94717 indicated a strong positive association between customer relationship management practices and customer satisfaction in the farmer sample. The R Square value of 0.89714 indicated that approximately 89.71 per cent of the observed variation in customer satisfaction was statistically accounted for by customer relationship management practices in the fitted model.

The regression coefficient of 0.72996 was positive and statistically significant at $p < 0.001$. The t value of 27.7037 and the reported F -value of 767.50 further indicated that the fitted regression model was statistically significant. The results therefore provided statistical evidence of a positive association between customer relationship management practices and customer satisfaction among the farmers surveyed.

The thesis formulated the null hypothesis that customer relationship management practices had no significant relationship with customer satisfaction and the alternative hypothesis that a significant relationship existed. Based on the reported significance of the regression coefficient, the thesis rejected the null hypothesis.

4.2.4 Caution in interpretation

The regression result was interpreted as a statistical relationship rather than definitive evidence of causation. The data were cross-sectional survey data and the sampling procedure was nonprobability based. Therefore, the model described the observed association in the selected sample and did not establish that changes in customer relationship management practices would necessarily cause an equivalent change in customer satisfaction in all agribusiness settings.

The result nevertheless provided an empirical basis for examining customer relationship management as an important factor associated with customer satisfaction in the study area. The high coefficient of determination also indicated that the measured customer relationship management construct was closely associated with the reported satisfaction measure in the fitted model.

5. Discussion

5.1 Discussion of major customer relationship management practices

The first objective demonstrated that practical service support was prominent in the customer relationship management experiences reported by both respondent groups. Farmers assigned the highest relative score to appropriate solutions for pest and disease problems. This result was consistent with the practical nature of agricultural decision-making, where customers may require timely assistance when crop problems arise.

The high score for timely information about agricultural products and technology also highlighted the importance of information exchange. Agricultural inputs often require correct selection and application, and farmers may depend on dealers, retailers and company representatives for relevant information. The thesis literature review identified information management, communication and technical assistance as important elements of customer relationship management. [1, 4, 5]

Among dealers and retailers, complaint handling and problem-solving support obtained the highest mean score. This result suggested that intermediary relationships were strongly connected with responsiveness to operational concerns. Technical guidance ranked second, reinforcing the role of dealers and retailers as an important interface between agricultural companies and farmers.

The finding was compatible with the agribusiness-specific literature reviewed in the thesis. Torres Jr. and colleagues emphasized customer

interaction, information management, organizational commitment and customer-oriented processes among agribusiness firms. (Torres Jr *et al.*, 2007) [4] Milovic emphasized information technology and communication as tools for improving responsiveness in agricultural customer relationships. [5]

5.2 Communication and technical support

Communication appeared in both respondent groups but through somewhat different forms. Farmers were assessed on timely information about agricultural products and technology, while dealers and retailers were assessed on timely information through phone, WhatsApp and SMS. The results suggested that relationship management in rural agribusiness involved both direct interpersonal support and communication channels.

5.3 Discussion

Relationship between CRM Practices and Satisfaction

The second objective showed a strong positive statistical association between customer relationship management practices and customer satisfaction. The Multiple R of 0.94717 and R Square of 0.89714 indicated that the customer relationship management measure was strongly associated with the satisfaction measure in the selected farmer sample.

The finding was conceptually consistent with relationship-marketing literature. Morgan and Hunt identified trust, commitment and communication as important foundations of relationship marketing. [2] Garbarino and Johnson emphasized satisfaction, trust and commitment as important elements of customer relationships. (Garbarino *et al.*, 1999) [3] Shaon and Rahman specifically reviewed customer relationship management in relation to customer satisfaction and loyalty and highlighted service quality, communication and responsiveness. (Shaon *et al.*, 2015) [9]

The result also corresponded with the agribusiness context examined by Goranda and colleagues, who reported positive relationships among customer relationship management, customer satisfaction and loyalty in an agribusiness e-commerce setting. (Goranda *et al.*, 2021) [11] The present study differed in setting and measurement but similarly connected customer relationship management practices with customer satisfaction.

5.4 Service responsiveness and satisfaction

The descriptive findings provided a practical interpretation of the statistical relationship. The practices receiving relatively high scores included problem-solving support, technical guidance and timely information. These activities directly addressed the service needs of farmers. A customer relationship system that provides information but does not respond to production problems may not address the full range of customer requirements.

The overall satisfaction mean of 3.48 indicated a moderately positive level of satisfaction. When considered together with the regression results, the findings suggested that customer relationship management was an important component of the service experience reported by farmers.

5.5 Comparison with previous research

The findings were broadly aligned with the literature reviewed in the thesis, which consistently emphasized communication, information management, responsiveness, customer interaction and relationship-oriented service. However, the present study was geographically focused on Baramati Taluka and included a specific combination of farmers and agribusiness intermediaries. Therefore, the results should be considered within that empirical context.

6. Implications, limitations and Conclusion

6.1 Practical implications

The findings provide several practical implications for agribusiness firms, agricultural input companies, dealers and retailers. First, technical support should remain an important component of customer re-

relationship management. The high farmer score for pest and disease problem solutions indicated that practical assistance was strongly valued by respondents.

Second, timely information should be maintained as a regular relationship activity. Communication concerning new products and agricultural technology received a relatively high score among farmers, while dealers and retailers also valued timely communication through phone, WhatsApp and SMS.

Third, complaint handling and problem-solving mechanisms should be responsive. This practice received the highest mean score among dealers and retailers. A clear process for receiving and addressing customer concerns can support continuity of relationships.

Fourth, post-purchase follow-up should not be overlooked. Although it ranked fourth among farmers, the mean score remained above the neutral midpoint of the five-point scale. Regular follow-up can provide an opportunity to identify problems after purchase and provide additional support.

6.2 Limitations

The study was limited geographically to Baramati Taluka of Pune District. The sample consisted of selected farmers and dealers and retailers and was drawn using purposive and convenience sampling.

Therefore, the findings cannot be treated as statistically representative of all farmers or agribusiness channel partners in Maharashtra. The analysis was also based on respondent perceptions and cross-sectional data.

6.3 Conclusion

The study identified customer relationship management practices that were prominent in the selected rural agribusiness environment and examined their association with customer satisfaction. Farmers gave the highest relative importance to solutions for pest and disease problems, while dealers and retailers gave the highest relative importance to complaint handling and problem solving support. Customer relationship management practices were positively and significantly associated with customer satisfaction among the surveyed farmers. The findings highlighted the importance of technical support, timely information, responsive problem solving and continuing customer interaction in rural agribusiness.

Tables

Table 1. Customer relationship management practices from farmers' perspective

Sr. No.	Customer relationship management practice	Mean	SD	Rank
1	Timely information about new agricultural products and technology	3.44	1.19	II
2	Appropriate solutions for pest and disease problems	3.56	1.08	I
3	Post-purchase followup	3.32	1.25	IV
4	Complaint handling and problem-solving support	3.43	1.22	III

Source: Primary survey data.

Table 2: Customer relationship management practices from dealers' and retailers' perspective

Sr. No.	Customer relationship management practice	Mean	SD	Rank
1	Timely information through phone/WhatsApp/SMS	3.58	1.11	III
2	Technical guidance to farmers	3.70	1.18	II
3	Complaint handling and problem-solving support	3.77	1.27	I
4	Post-purchase followup	3.58	1.32	III

Source: Primary survey data.

Note: The tables are based on the corresponding thesis results. Table 1 represents responses from 90 farmers and Table 2 represents responses from 40 dealers and retailers.

Table 3. Regression analysis of customer relationship management practices and customer satisfaction

Particular	Value
Multiple R	0.94717
R Square	0.89714
Adjusted R Square	0.89597
Standard Error	0.26298
F-value	767.50
Significance	$p < 0.001$
Regression coefficient	0.72996
Standard error of coefficient	0.02635

t -value 27.7037

Source: Primary survey data.

Regression

equation:

Customer Satisfaction = $0.856 + 0.730(\text{Customer Relationship Management Practices})$.

Note: The regression analysis was based on 90 farmers. The reported results were interpreted as a statistical relationship in the selected cross-sectional sample and not as definitive evidence of causation.

Author declaration

The manuscript was prepared from the submitted thesis and its reported empirical findings for the first two research objectives. No numerical results beyond those reported in the thesis were introduced into the manuscript.

Conflict of interest

No conflict of interest related to the reported study was stated in the thesis.

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Authors

Gautam Gajanan Jadhao

Research Scholar, Department of Agribusiness Management; Division of Statistics, Dr. Sharadchandra Pawar College of MBA (Agri.), Baramati, Mahatma Phule Krishi Vidyapeeth, Rahuri, Maharashtra, India.

MS Pisal

Assistant Professor and Research Guide, Division of Agribusiness Management, Dr. Sharadchandra Pawar College of MBA (Agri.), Baramati, Mahatma Phule Krishi Vidyapeeth, Rahuri, Maharashtra, India

AA Gadhave

Assistant Professor, Division of Agribusiness Management, Dr. Sharadchandra Pawar College of MBA (Agri.), Baramati, Mahatma Phule Krishi Vidyapeeth, Rahuri, Maharashtra, India

PA Shitole

Assistant Professor, Division of Statistics, Dr. Sharadchandra Pawar College of MBA (Agri.), Baramati, Mahatma Phule Krishi Vidyapeeth, Rahuri, Maharashtra, India.

PS Deokate

Dr. Sharadchandra Pawar College of MBA (Agri.), Baramati, Mahatma Phule Krishi Vidyapeeth, Rahuri, Maharashtra, India

RB Shinde

Dr. Sharadchandra Pawar College of MBA (Agri.), Baramati, Mahatma Phule Krishi Vidyapeeth, Rahuri, Maharashtra, India

AD Bhoite

Dr. Sharadchandra Pawar College of MBA (Agri.), Baramati, Mahatma Phule Krishi Vidyapeeth, Rahuri, Maharashtra, India

Pavan Tambe

Dr. Sharadchandra Pawar College of MBA (Agri.), Baramati, Mahatma Phule Krishi Vidyapeeth, Rahuri, Maharashtra, India

Krishana

Dr. Sharadchandra Pawar College of MBA (Agri.), Baramati, Mahatma Phule Krishi Vidyapeeth, Rahuri, Maharashtra, India

Aniket

Dr. Sharadchandra Pawar College of MBA (Agri.), Baramati, Mahatma Phule Krishi Vidyapeeth, Rahuri, Maharashtra, India

Audumber

Dr. Sharadchandra Pawar College of MBA (Agri.), Baramati, Mahatma Phule Krishi Vidyapeeth, Rahuri, Maharashtra, India

Hrushikesh

Dr. Sharadchandra Pawar College of MBA (Agri.), Baramati, Mahatma Phule Krishi Vidyapeeth, Rahuri, Maharashtra, India

Pawan

Dr. Sharadchandra Pawar College of MBA (Agri.), Baramati, Mahatma Phule Krishi Vidyapeeth, Rahuri, Maharashtra, India