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Effects of Product Quality, Price, and Service Quality on Rice Seed Repurchase through Customer Satisfaction

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Abstract

Purpose: This study examines the effects of product quality, price, and service quality on rice seed repurchase decisions, with customer satisfaction as a mediator at East Java's UPT PBPP.

Research Methodology: A quantitative causal approach was applied to 100 farmers and seed distributors selected through purposive sampling. Data were analyzed using SPSS, path analysis, and the Sobel test.

Results: Product quality (*B*=0.467), price (*B*=0.434), and service quality (*B*=0.439) significantly affect customer satisfaction, explaining 85.0% of its variance. Product quality (*B*=0.256), price (*B*=0.266), and satisfaction (*B*=0.315) significantly influence repurchase decisions, while service quality has no significant direct effect (*p*=0.113). Satisfaction partially mediates product quality and price effects and fully mediates service quality.

Conclusions: Customer satisfaction plays a crucial role in strengthening rice seed repurchase decisions.

Limitations: The study is limited by its cross-sectional design, exclusion of demographic variables, and reliance on the Sobel test.

Contributions: The findings extend satisfaction-based repurchase models to government-managed agricultural seed institutions and provide practical insights for improving product quality, pricing, and services.

Keywords: *Customer Satisfaction, Price, Product Quality, Repurchase Decision, Service Quality*

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1. Introduction

The agricultural sector plays a fundamental role in Indonesia's economic development by contributing to food security, employment, and rural economic growth. Among agricultural commodities, rice remains strategic because it is the primary staple food of Indonesian society. The sustainability of rice production depends strongly on the availability of high quality seeds, because seed quality determines germination performance, crop productivity, resistance to environmental stress, and farmers' confidence in adopting particular varieties. Studies of farmers' seed choices show that the use of certified seed depends on perceived quality, price, and the information and services provided by suppliers (Rutsaert, Donovan, Murphy, & Hoffmann, 2024). Ensuring the availability of certified and reliable rice seeds has therefore become an important priority for agricultural institutions and policymakers.

In East Java, one of Indonesia's major rice producing regions, the supply of quality rice seeds is supported by the East Java Rice and Secondary Crops Seed Development Center (*Unit Pelaksana*

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Teknis Pengembangan Benih Padi dan Palawija, UPT PBPP). This institution produces and distributes certified rice seeds to farmers and seed distributors. Compared with private seed suppliers, UPT PBPP offers several competitive advantages, including relatively affordable prices, high germination quality, proper packaging standards, and minimal seed impurities. The institution has also introduced service improvement initiatives based on BerAKHLAK, the core values of the Indonesian civil service, and on the 5S service principle of smiling, greeting, addressing customers, politeness, and courtesy. These efforts are expected to strengthen customer satisfaction and encourage customers to keep purchasing rice seeds from the institution.

Despite these advantages, customers' repurchase decisions still vary. The availability of quality products, competitive prices, and adequate service does not automatically guarantee customer loyalty. Customers evaluate their purchasing experiences on the basis of overall satisfaction, perceived value, and expectations regarding product performance and service delivery (Otto, Szymanski, & Varadarajan, 2020). Research on agricultural input markets shows that farmers' repurchase intentions are driven mainly by their satisfaction with suppliers rather than by single attributes (Syahlani, Haryadi, Setyawan, Mayasari, Dewi, & Qui, 2022). Customer satisfaction may therefore function as an important psychological mechanism that explains how product and service factors influence future purchasing decisions. Satisfied customers are more likely to develop trust, maintain relationships with suppliers, and show repeated purchasing behavior (Ilyas, Rahmi, Tamsah, Munir, & Putra, 2020).

Previous studies have highlighted the importance of product quality, price, and service quality in shaping customer satisfaction and repurchase decisions (Desara, Verinita, Maruf, & Hidayat, 2021; Susanto, Sudapet, Subagyo, & Suyono, 2021). Product quality reflects the ability of a product to meet customer expectations, price represents customers' perceptions of affordability and value, and service quality shapes customer experiences through responsiveness, reliability, and the quality of interaction (Kotler & Keller, 2016). Although these relationships have been widely examined in retail, hospitality, banking, and commercial services (Fida, Ahmed, Al-Balushi, & Singh, 2020), limited empirical evidence explains how they operate within government managed agricultural institutions, particularly certified rice seed providers. This indicates a research gap regarding the mediating role of customer satisfaction between marketing factors and repurchase decisions in the agricultural sector.

From a theoretical perspective, understanding repurchase behavior requires examining not only the direct effects of product and service attributes but also the indirect pathways through customer evaluations. Expectation confirmation theory suggests that positive experiences that confirm or exceed expectations generate satisfaction, which in turn strengthens behavioral intentions such as repeat purchases (Zhang, Chen, Petrovsky, & Walker, 2022). Investigating customer satisfaction as a mediator therefore provides a more complete explanation of how product quality, price, and service quality influence repurchase decisions, and it allows the type of mediation to be identified for each attribute (Nitzl, Roldán, & Cepeda, 2016).

Based on this gap, the study pursues three objectives. The first is to examine the effects of product quality, price, and service quality on customer satisfaction. The second is to examine the direct effects of product quality, price, service quality, and customer satisfaction on rice seed repurchase decisions. The third is to examine the mediating role of customer satisfaction in the relationships between the three marketing factors and repurchase decisions among customers of UPT PBPP East Java. Theoretically, the study extends satisfaction based repurchase models to the agricultural input sector and to a government managed seed institution. Practically, the findings provide insights for UPT PBPP and similar organizations in developing strategies for product improvement, pricing, and service quality that increase satisfaction and encourage sustained repurchase.

2. Literature Review and Hypothesis/es Development

2.1 Expectation Confirmation Theory and Repurchase Behavior

This study draws on expectation confirmation theory, also known as the expectancy disconfirmation model, as its main theoretical lens. The theory proposes that consumers form expectations before purchase, compare those expectations with the performance they perceive after use, and become satisfied when performance confirms or exceeds expectations (Oliver, 1999). A meta analysis of research using this model confirms that perceived performance is the strongest determinant of satisfaction, while expectations and disconfirmation also play roles (Zhang et al., 2022). Satisfaction then shapes subsequent intentions and behaviors, including repurchase, recommendation, and loyalty. Evidence from more than two decades of research shows that satisfaction is consistently linked to customer retention and firm performance (Otto et al., 2020).

For agricultural inputs such as rice seed, the expectation confirmation process is particularly relevant because the true quality of seed is revealed only after planting, through germination, crop vigor, and yield. Farmers form expectations based on the supplier's reputation, packaging, certification labels, and price, and they evaluate performance during the growing season (Pham & Napasintuwong, 2020). Studies of maize seed markets show that farmers tend to repurchase familiar varieties and brands whose performance they have already confirmed, which illustrates the importance of satisfaction and accumulated experience for repeat purchases (Rutsaert et al., 2024). Expectation confirmation theory therefore provides an appropriate basis for treating product quality, price, and service quality as antecedents of satisfaction and satisfaction as the bridge to repurchase decisions.

2.2 Product Quality

Product quality refers to the ability of a product to perform its functions, including durability, reliability, precision, ease of operation, and other valued attributes (Kotler & Armstrong, 2018). For rice seed, quality is reflected in germination rate, genetic purity, freedom from impurities and disease, moisture content, and conformity with certification standards. High seed quality reduces farmers' production risk and increases expected yields, so it directly affects their evaluation of the supplier. Research in food and service settings shows that perceived product quality is one of the strongest predictors of satisfaction and repeat intentions (Konuk, 2019, Rajput & Gahfoor, 2020).

From the perspective of expectation confirmation theory, seed that germinates well and produces healthy crops confirms farmers' expectations and creates satisfaction, while poor germination or contamination creates dissatisfaction and switching. Product quality may also influence repurchase directly, because farmers who have experienced good results are likely to buy the same seed again even without forming an explicit satisfaction judgment (Uddin, 2019). Studies of certified seed adoption show that farmers' perceptions of seed quality and yield advantages are key drivers of their willingness to pay for and continue using certified seed (Pham & Napasintuwong, 2020).

2.3 Price

Price is the amount of money charged for a product or service, or the sum of the values that customers exchange for the benefits of having or using it (Kotler & Armstrong, 2018). Customers evaluate price not only in terms of affordability but also in terms of fairness and the value received relative to the sacrifice made (Tjiptono, 2019). For farmers, the price of seed is part of their production cost, so price perceptions are closely linked to expected returns. A price that is perceived as affordable and commensurate with seed quality increases perceived value and satisfaction (Zhong & Moon, 2020).

Price fairness can also influence repurchase directly, particularly in price sensitive markets where customers compare suppliers. Research shows that perceived price fairness increases satisfaction, revisit intention, and loyalty (Çakıcı, Akgündüz, & Yıldırım, 2019; Konuk, 2019), and studies of Indonesian consumers report that price affects both satisfaction and repurchase intention (Susanto, Sudapet, Subagyo, & Suyono, 2021). Evidence from seed markets shows that price discounts can

encourage farmers to try and purchase seed, although familiarity and loyalty also strongly shape their choices (Rutsaert, Donovan, Murphy, & Hoffmann, 2024). Because UPT PBPP offers relatively affordable prices compared with private suppliers, price is expected to be an important determinant of both satisfaction and repurchase.

2.4 Service Quality

Service quality is the extent to which service performance meets or exceeds customer expectations. The SERVQUAL model identifies five dimensions of service quality, namely tangibles, reliability, responsiveness, assurance, and empathy (Parasuraman, Zeithaml, & Berry, 1988). In a seed institution, these dimensions include the condition of facilities and packaging, accuracy and timeliness of seed availability, responsiveness to farmers' questions, the competence and courtesy of staff, and attention to individual needs. Studies across sectors confirm that service quality has a strong positive effect on satisfaction (Gong, & Yi, 2018; Shokouhyar, Shokoohyar, & Safari, 2020) and research on fast food and online services shows that customers evaluate service through several distinct dimensions that each contribute to their overall judgment (Rita, Oliveira, & Farisa, 2019).

The effect of service quality on repurchase is often indirect. Several studies show that service quality increases loyalty mainly by increasing satisfaction, and that its direct effect on loyalty may be weak once satisfaction is considered (Supriyanto, Wiyono, & Burhanuddin, 2021). In agricultural input markets, the friendliness and helpfulness of salespeople have been found to increase satisfaction, which in turn drives repurchase intention, while expertise alone has little effect (Syahlani, Haryadi, Setyawan, Mayasari, Dewi, & Qui, 2022). The BerAKHLAK values and the 5S principle adopted by UPT PBPP are therefore expected to influence repurchase decisions mainly through the satisfaction they create.

2.5 Customer Satisfaction

Customer satisfaction is a person's feeling of pleasure or disappointment that results from comparing a product's perceived performance with expectations (Kotler & Keller, 2016). Satisfaction is a cumulative evaluation that develops over repeated purchases and consumption experiences, and it is a central outcome of marketing activity. Satisfied customers tend to repurchase, recommend the supplier to others, and become less sensitive to competitors' offers (Fida, Ahmed, Al-Balushi, & Singh, 2020; Hapsari, Clemes, & Dean, 2017). Research comparing online and offline purchases confirms that perceived quality and perceived value drive satisfaction, which in turn drives loyalty across channels (Hult, Sharma, Morgeson, & Zhang, 2019).

Satisfaction is positioned as a mediating variable because product and service attributes may not translate directly into repurchase unless they produce a positive overall evaluation. Studies show that satisfaction mediates the effects of service quality, perceived value, and corporate image on loyalty (Özkan, Süer, Keser, & Kocakoç, 2020), the effects of service quality and price on repurchase intention (Susanto, Sudapet, Subagyo, & Suyono, 2021), and the effects of service quality and product assortment on repurchase in retail (Desara, Verinita, Maruf, & Hidayat, 2021). Research on home delivery services and supermarkets also shows that satisfaction links service quality to customer loyalty (Uzir, Thurasamy, Hock, Aljaberi, Hasan, & Hamid, 2021).

2.6 Repurchase Decision

A repurchase decision is a customer's decision to buy the same product or from the same supplier again after a previous purchase. It reflects behavioral loyalty, which Oliver (1999) describes as the final stage of loyalty development, following cognitive, affective, and conative loyalty. Repurchase is valuable for suppliers because retaining existing customers is generally less costly than acquiring new ones and because repeat customers provide stable demand. In seed markets, repurchase is especially important because farmers buy seed every planting season, so retaining them over several seasons determines a supplier's long term market share (Rutsaert, Donovan, Murphy, & Hoffmann, 2024).

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Repurchase decisions are shaped by previous experiences, satisfaction, perceived value, trust, and switching costs (Ha, Nguyen, & Doan, 2023; Ilyas, Rahmi, Tamsah, Munir, & Putra, 2020). Customers who have received consistent quality and fair prices, and who have been treated well, are more likely to return, because positive experiences build trust and reduce perceived risk (Jin, Line, & Merkebu, 2016). Conversely, dissatisfaction may lead customers to switch suppliers or seek alternatives. Studies in higher education and other services show that satisfaction is the most immediate antecedent of loyalty, and that service quality builds loyalty mainly by increasing satisfaction (Teeroovengadum, Nunkoo, Grönroos, Kamalanabhan, & Seebaluck, 2019).

2.7 Hypothesis Development

Drawing on expectation confirmation theory, seed that performs well, prices that customers perceive as fair, and service that meets expectations all confirm customers' expectations and therefore increase satisfaction. Empirical studies consistently report positive effects of product quality (Konuk, 2019; Rajput, & Gahfoor, 2020), price fairness (Zhong & Moon, 2020), and service quality (Shokouhyar, Shokoohyar, & Safari, 2020) on satisfaction. The first three hypotheses are therefore proposed as follows.

H_1: Product quality has a positive and significant effect on customer satisfaction.

H_2: Price has a positive and significant effect on customer satisfaction.

H_3: Service quality has a positive and significant effect on customer satisfaction.

Product quality and price may also affect repurchase directly, because farmers who obtain good harvests at reasonable cost are likely to buy the same seed again (Rutsaert, Donovan, Murphy, & Hoffmann, 2024). Service quality may similarly encourage repurchase by making the purchasing process convenient and reliable (Supriyanto, Wiyono, & Burhanuddin, 2021). Satisfaction is expected to have the strongest direct effect on repurchase because satisfied customers are more likely to return (Fida, Ahmed, Al-Balushi, & Singh, 2020). The next four hypotheses are therefore proposed as follows.

H_4: Product quality has a positive and significant effect on repurchase decisions.

H_5: Price has a positive and significant effect on repurchase decisions.

H_6: Service quality has a positive and significant effect on repurchase decisions.

H_7: Customer satisfaction has a positive and significant effect on repurchase decisions.

Expectation confirmation theory implies that product quality, price, and service quality influence repurchase at least partly through satisfaction. Previous studies support the mediating role of satisfaction for service quality and price (Susanto, Sudapet, Subagyo, & Suyono, 2021) and for service quality and product attributes (Syahlani, Haryadi, Setyawan, Mayasari, Dewi, & Qui, 2022). The mediation hypotheses are therefore proposed as follows.

H_8: Customer satisfaction mediates the effect of product quality on repurchase decisions.

H_9: Customer satisfaction mediates the effect of price on repurchase decisions.

H_{10}: Customer satisfaction mediates the effect of service quality on repurchase decisions.

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The research model that integrates the ten hypotheses is presented in Figure 1.

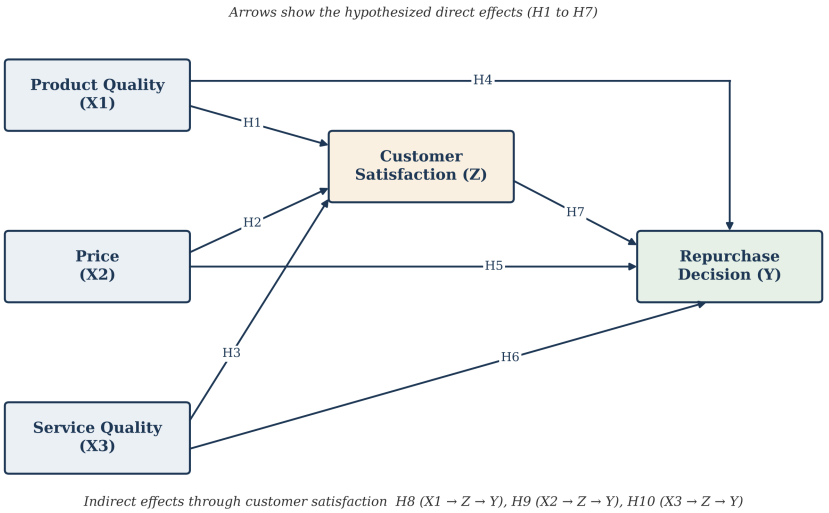


Figure 1. Research model

Figure 1 shows the research model, in which product quality (X_1), price (X_2), and service quality (X_3) are the independent variables, customer satisfaction (Z) is the mediating variable, and repurchase decision (Y) is the dependent variable. Hypotheses H_1 to H_3 represent the paths from the three marketing factors to satisfaction, H_4 to H_6 represent their direct paths to repurchase decisions, and H_7 represents the path from satisfaction to repurchase decisions. The indirect paths through satisfaction, labeled H_8 to H_{10}, combine each factor to satisfaction path with the satisfaction to repurchase path. Because the model includes both the direct and the indirect paths from each factor to repurchase decisions, it allows partial mediation, in which both effects are significant, to be distinguished from full mediation, in which only the indirect effect is significant (Nitzl, Roldán, & Cepeda, 2016).

3. Research Methodology

3.1 Research Design, Population, and Sample

This study used a quantitative correlational and causal design (Sugiyono, 2019). The population consisted of farmers and seed distributors who had purchased rice seeds from UPT PBPP East Java. Using purposive sampling, 100 respondents who had previously purchased rice seeds from the institution and completed the questionnaire were selected. The criterion of previous purchase ensured that respondents had direct experience with the institution's seeds, prices, and services and could therefore evaluate their satisfaction and repurchase decisions.

3.2 Measurement

Primary data were collected with a structured questionnaire using a five point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Product quality and price were each measured with three items, service quality and repurchase decision with four items each, and customer satisfaction with five items, giving 19 items in total. The items were adapted from previously validated indicators, with product quality and price based on Kotler and Armstrong (2018), service quality based on the SERVQUAL dimensions (Parasuraman et al., 1988), customer satisfaction based on Kotler and Keller (2016), and repurchase decision based on the loyalty framework of Oliver (1999). Variable scores were computed as the sum of item scores.

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3.3 Data Analysis

Data were analyzed with SPSS in four stages. First, validity was tested with corrected item total correlations and reliability with Cronbach's alpha. Second, classical assumption tests were conducted for normality (Kolmogorov Smirnov), multicollinearity (tolerance and variance inflation factor), heteroscedasticity (Glejser test), and linearity (deviation from linearity). Third, path analysis was conducted through two stage multiple linear regression. Model 1 regressed customer satisfaction on product quality, price, and service quality, and Model 2 regressed repurchase decision on product quality, price, service quality, and customer satisfaction. A third regression of repurchase decision on the three marketing factors without satisfaction was used to estimate their total effects. Fourth, the Sobel test was used to examine whether the indirect effects through customer satisfaction were significant. Effects were considered significant when $p<0.05$, and the type of mediation was classified as partial or full by comparing the direct and indirect effects (Nitzl et al., 2016).

4. Results and Discussions

4.1 Descriptive Statistics and Instrument Testing

Research data were obtained from 100 respondents, consisting of farmers and seed distributors who were customers of UPT PBPP East Java. The descriptive statistics of the research variables are presented in Table 1.

Table 1. Descriptive statistics of research variables

Variable	Number of Items	Minimum	Maximum	Mean	Standard Deviation
Product Quality (X_1)	3	8	15	11.460	2.101
Price (X_2)	3	7	15	11.490	2.267
Service Quality (X_3)	4	10	20	15.430	2.924
Customer Satisfaction (Z)	5	12	25	18.970	3.374
Repurchase Decision (Y)	4	11	20	15.400	2.734

Table 1 shows that the total scores of all five variables fall within the moderate to high range. When the means are divided by the number of items, the average item scores are about 3.82 for product quality, 3.83 for price, 3.86 for service quality, 3.79 for customer satisfaction, and 3.85 for repurchase decision on the five point scale, which indicates that respondents generally agreed with the statements. Service quality and price show a larger proportion of high category scores than the other variables, which reflects the institution's competitive seed pricing and the positive impact of its BerAKHLAK based service. The maximum scores of all variables reach the highest possible value, while the minimum scores are above the lowest possible value, which shows that no respondent gave uniformly negative evaluations. The standard deviations, which range from 2.101 to 3.374, indicate moderate variation among respondents, which is sufficient for regression analysis.

Validity testing showed that all items were valid, with corrected item total correlations between 0.762 and 0.863, well above the minimum of 0.30. The results of the reliability test are presented in Table 2.

Table 2. Reliability test results

Variable	Number of Items	Cronbach alpha	Remark
Product Quality (X_1)	3	0.891	Reliable
Price (X_2)	3	0.917	Reliable
Service Quality (X_3)	4	0.926	Reliable
Customer Satisfaction (Z)	5	0.932	Reliable
Repurchase Decision (Y)	4	0.925	Reliable

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Table 2 shows that all variables are reliable, with Cronbach's alpha values ranging from 0.891 for product quality to 0.932 for customer satisfaction. All values are far above the minimum threshold of 0.60 used in this study and also exceed the stricter threshold of 0.70 commonly applied in marketing research, which indicates high internal consistency among the items of each variable. Customer satisfaction, which has the largest number of items, shows the highest reliability, while product quality and price, which have only three items each, still show alpha values close to or above 0.90. Together with the validity results, these findings confirm that the questionnaire measured the five variables consistently and that the summed scores can be used in the regression analysis.

4.2 Classical Assumption Tests

Before hypothesis testing, all regression models were tested for normality, multicollinearity, heteroscedasticity, and linearity. The results are summarized in Table 3.

Table 3. Summary of classical assumption test results

Test	Regression Model	Criterion	Result
Normality (Kolmogorov Smirnov)	Total effect model, Model 1, Model 2	Sig.>0.05	Sig. 0.200, 0.998, and 0.960 (normal)
Multicollinearity	Model 1 and Model 2	Tolerance > 0.10 and VIF<10	Tolerance 0.130 to 0.213 and VIF 4.687 to 7.713 (no multicollinearity)
Heteroscedasticity (Glejser)	Total effect model, Model 1, Model 2	Sig.>0.05	Sig. 0.140 to 0.942 (homoscedastic)
Linearity (deviation from linearity)	Y on X_1, X_2, and X_3	Sig.>0.05	Sig. 0.075, 0.254, and 0.671 (linear)

Table 3 shows that all regression models satisfy the classical assumptions. The Kolmogorov Smirnov significance values of 0.200, 0.998, and 0.960 are above 0.05, which indicates that the residuals are normally distributed. The tolerance values between 0.130 and 0.213 are above 0.10 and the VIF values between 4.687 and 7.713 are below 10, so there is no severe multicollinearity, although the relatively high VIF values show that the independent variables are strongly correlated with one another. The Glejser test produced significance values between 0.140 and 0.942, which indicates that the residual variance is constant, and the deviation from linearity values of 0.075, 0.254, and 0.671 confirm linear relationships between the independent variables and repurchase decision. All regression models are therefore suitable for hypothesis testing.

4.3 Path Analysis Results

Model 1 shows that product quality, price, and service quality jointly have a significant effect on customer satisfaction (R^2=0.850, F=181.223, p<0.001), meaning that 85.0% of the variation in customer satisfaction is explained by the three variables. The regression coefficients of Model 1 are presented in Table 4.

Table 4. Regression coefficients of Model 1 (dependent variable customer satisfaction)

Variable	*B*	*β*	*t*	Sig.
Constant	1.867		2.485	0.015
Product Quality (X_1)	0.467	0.291	3.115	0.002
Price (X_2)	0.434	0.291	3.404	0.001
Service Quality (X_3)	0.439	0.380	3.704	< 0.001

Table 4 shows that all three independent variables have positive and significant effects on customer satisfaction. The unstandardized coefficients indicate that a one point increase in the product quality score is associated with an increase of 0.467 points in the satisfaction score (t=3.115, p=0.002), holding the other variables constant, while the corresponding increases for price and service quality are 0.434 (t=3.404, p=0.001) and 0.439 (t=3.704, p<0.001). The standardized coefficients allow the

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relative strength of the effects to be compared, and they show that service quality has the strongest effect on satisfaction (β=0.380), followed by product quality and price with equal standardized effects (β=0.291). This means that, although service quality does not directly affect repurchase, it is the most important driver of farmers' and distributors' satisfaction with UPT PBPP.

Model 2 shows that product quality, price, service quality, and customer satisfaction jointly have a significant effect on repurchase decision (R^2=0.864, p<0.001), meaning that 86.4% of the variation in repurchase decision is explained by the four variables. The regression coefficients of Model 2 are presented in Table 5.

Table 5. Regression coefficients of Model 2 (dependent variable repurchase decision)

Variable	*B*	*β*	*t*	Sig.
Constant	1.019		1.696	0.093
Product Quality (X_1)	0.256	0.196	2.099	0.038
Price (X_2)	0.266	0.221	2.545	0.013
Service Quality (X_3)	0.157	0.168	1.600	0.113
Customer Satisfaction (Z)	0.315	0.388	3.979	< 0.001

Table 5 shows that product quality (B=0.256, t=2.099, p=0.038), price (B=0.266, t=2.545, p=0.013), and customer satisfaction (B=0.315, t=3.979, p<0.001) have significant positive effects on repurchase decision, while service quality has no significant direct effect (B=0.157, t=1.600, p=0.113). The standardized coefficients show that customer satisfaction is the strongest predictor of repurchase decision (β=0.388), followed by price (β=0.221) and product quality (β=0.196). However, in the total effect model that excludes customer satisfaction, service quality has a significant effect on repurchase decision (B=0.295, p=0.004). The loss of significance once satisfaction is included indicates that the effect of service quality on repurchase operates through customer satisfaction.

4.4 Sobel Test and Hypothesis Testing

The Sobel test was used to examine whether the indirect effects of the three independent variables on repurchase decision through customer satisfaction are significant. The results are presented in Table 6.

Table 6. Sobel test results

Mediation Path	Indirect effect (a × b)	Sobel *z*	Sig.	Remark
Product Quality → Customer Satisfaction → Repurchase Decision	0.147	2.453	0.014	Significant
Price → Customer Satisfaction → Repurchase Decision	0.136	2.587	0.010	Significant
Service Quality → Customer Satisfaction → Repurchase Decision	0.138	2.711	0.007	Significant

Table 6 shows that all three mediation paths are significant at p<0.05. Each indirect effect is the product of the path from the independent variable to satisfaction in Model 1 and the path from satisfaction to repurchase decision in Model 2, for example 0.467 × 0.315 ≈ 0.147 for product quality, 0.434 × 0.315 ≈ 0.136 for price, and 0.439 × 0.315 ≈ 0.138 for service quality. The service quality path has the highest Sobel z value (2.711, p=0.007), followed by price (2.587, p=0.010) and product quality (2.453, p=0.014). These results confirm that customer satisfaction is a significant channel through which all three marketing factors influence repurchase decisions. The results of all hypothesis tests are summarized in Table 7.

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Table 7. Summary of hypothesis testing results

Hypothesis	Path	Coefficient (*B*)	*t* or *z* (Sig.)	Conclusion
H_1	Product Quality → Customer Satisfaction	0.467	3.115 (0.002)	Supported
H_2	Price → Customer Satisfaction	0.434	3.404 (0.001)	Supported
H_3	Service Quality → Customer Satisfaction	0.439	3.704 (< 0.001)	Supported
H_4	Product Quality → Repurchase Decision	0.256	2.099 (0.038)	Supported
H_5	Price → Repurchase Decision	0.266	2.545 (0.013)	Supported
H_6	Service Quality → Repurchase Decision	0.157	1.600 (0.113)	Not supported
H_7	Customer Satisfaction → Repurchase Decision	0.315	3.979 (< 0.001)	Supported
H_8	Product Quality → Satisfaction → Repurchase Decision	0.147	2.453 (0.014)	Supported (partial mediation)
H_9	Price → Satisfaction → Repurchase Decision	0.136	2.587 (0.010)	Supported (partial mediation)
H_{10}	Service Quality → Satisfaction → Repurchase Decision	0.138	2.711 (0.007)	Supported (full mediation)

Table 7 shows that nine of the ten hypotheses are supported, namely H_1 to H_5 and H_7 to H_{10}, while H_6 is not supported. All direct paths to customer satisfaction are significant, and all direct paths to repurchase decision are significant except the path from service quality. For product quality and price, both the direct and the indirect effects on repurchase decision are significant, which indicates partial mediation, meaning that these factors influence repurchase both directly and through satisfaction. For service quality, only the indirect effect is significant, which indicates full mediation, meaning that service quality influences repurchase only by increasing satisfaction (Nitzl et al., 2016). The table therefore shows that customer satisfaction plays a central role in the model, either complementing or fully carrying the effects of the marketing factors on repurchase. The estimated path model is presented in Figure 2.

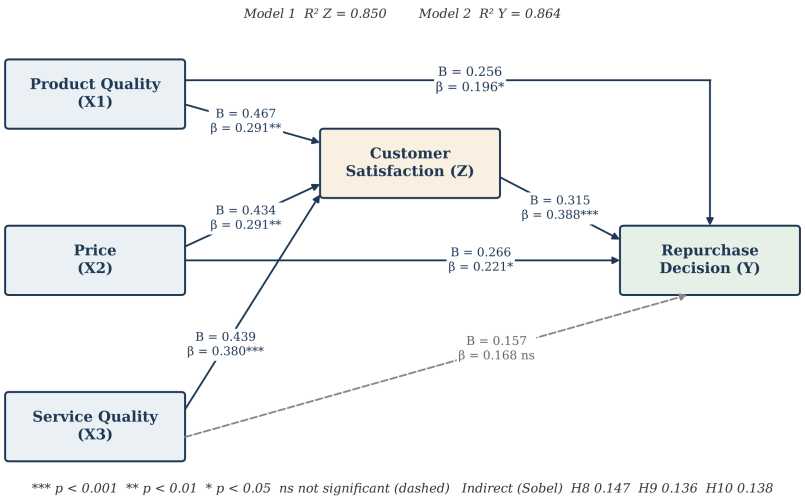


Figure 2. Path analysis results

Figure 2 presents the unstandardized (*B*) and standardized (β) path coefficients from Model 1 and Model 2 together with the explained variance of the two dependent variables. The solid arrows show

the significant paths, and the dashed arrow from service quality to repurchase decision shows the only nonsignificant path. The figure highlights the central position of customer satisfaction, which receives significant paths from all three marketing factors and sends the strongest standardized path to repurchase decision (β=0.388). It also shows that the model explains 85.0% of the variance in satisfaction and 86.4% of the variance in repurchase decision, which indicates high explanatory power. The indirect effects at the bottom of the figure show that the three mediated paths are of similar size, ranging from 0.136 for price to 0.147 for product quality.

4.5 Discussion

The findings show that product quality (B=0.467, β=0.291, p=0.002), price (B=0.434, β=0.291, p=0.001), and service quality (B=0.439, β=0.380, p<0.001) have positive and significant effects on customer satisfaction, supporting H_1, H_2, and H_3. This confirms that high quality rice seeds, competitive pricing, and responsive service increase farmers' and distributors' satisfaction with UPT PBPP. These results support expectation confirmation theory, because performance that meets expectations produces satisfaction (Zhang, Chen, Petrovsky, & Walker, 2022), and they are consistent with marketing theory (Tjiptono, 2019). They also agree with studies showing that product quality, price fairness, and service quality drive satisfaction in food, hospitality, and retail settings (Gong & Yi, 2018). The strongest standardized effect of service quality suggests that the BerAKHLAK values and the 5S principle have been effective in creating positive customer experiences.

Product quality (B=0.256, p=0.038) and price (B=0.266, p=0.013) also have significant direct effects on repurchase decisions, supporting H_4 and H_5. For farmers, seed quality and price are tangible factors that directly affect production results and costs, so they influence repurchase even beyond their effect on satisfaction. This is consistent with research on seed markets showing that farmers' choices are shaped by quality, price, and familiarity (Rutsaert, Donovan, Murphy, & Hoffmann, 2024) and with studies showing that price affects repurchase intention (Susanto, Sudapet, Subagyo, & Suyono, 2021). Customer satisfaction has the strongest effect on repurchase decisions (B=0.315, β=0.388, p<0.001), supporting H_7 and Oliver (1999) view that satisfaction is the foundation of loyalty. This finding agrees with research across sectors that identifies satisfaction as the most immediate driver of repeat purchase (Fida, Ahmed, Al-Balushi, & Singh, 2020).

Service quality has no significant direct effect on repurchase decisions (B=0.157, p=0.113), so H_6 is not supported. This suggests that good service alone does not make farmers buy seed again unless it contributes to their overall satisfaction. The finding is consistent with research showing that service quality influences loyalty mainly through satisfaction (Supriyanto, Wiyono, & Burhanuddin, 2021) and with evidence from agricultural input markets that salesperson behavior affects repurchase intention indirectly through satisfaction (Syahlani, Haryadi, Setyawan, Mayasari, Dewi, & Qui, 2022). It also fits the nature of seed purchases, in which the decisive outcome is crop performance during the season, while service is experienced only at the point of purchase and therefore matters mostly through its contribution to the overall evaluation.

The Sobel test confirms that customer satisfaction significantly mediates the effects of all three factors on repurchase decisions, supporting H_8, H_9, and H_{10}. Satisfaction partially mediates the effects of product quality and price, because their direct effects remain significant, and fully mediates the effect of service quality, because its direct effect becomes nonsignificant when satisfaction is included. These results are consistent with studies that find satisfaction mediating the effects of service quality and price on repurchase intention (Susanto et al., 2021) and the effects of service quality and other attributes on loyalty (Desara, Verinita, Maruf, & Hidayat, 2021). Overall, the findings highlight customer satisfaction as the key mechanism that links product quality, price, and service quality to customer loyalty and repeat purchasing behavior in the agricultural input sector.

These findings have practical implications for UPT PBPP and similar seed institutions. Because product quality affects repurchase both directly and through satisfaction, the institution should maintain strict quality control over germination, purity, and packaging and communicate certification clearly. Because price also affects repurchase directly, it should preserve its price advantage over

private suppliers while explaining the value that certified seed provides. Because service quality affects repurchase only through satisfaction, service improvements should focus on elements that increase farmers' overall satisfaction, such as reliable seed availability during planting seasons, accurate information about varieties, and responsive handling of complaints. Regularly measuring customer satisfaction would allow the institution to monitor the main driver of repeat purchases.

5. Conclusions

This study concludes that product quality, price, and service quality have positive and significant effects on customer satisfaction among farmers and seed distributors of UPT PBPP East Java, with service quality having the strongest standardized effect. Product quality, price, and customer satisfaction also significantly influence rice seed repurchase decisions, while service quality affects repurchase decisions only indirectly through customer satisfaction. Customer satisfaction partially mediates the effects of product quality and price and fully mediates the effect of service quality. These findings support expectation confirmation theory and marketing theory, and they indicate that UPT PBPP should place customer satisfaction at the center of its strategy while maintaining competitive prices, high seed quality, and excellent service.

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Author Contributions

RAA contributed to the conceptualization of the study, research design, data collection, data analysis, and the writing, review, and revision of the manuscript. LRRUT contributed to the conceptualization of the study, research design, data collection, data analysis, and the writing, review, and revision of the manuscript. Both authors read and approved the final manuscript.

Conflict of Interest

The authors declare that there is no conflict of interest regarding the publication of this article. The research was conducted independently and objectively, and the authors have no financial, commercial, or personal relationships with the East Java Rice and Secondary Crops Seed Development Center (UPT PBPP) or any other party that could have influenced the research design, data collection, data analysis, interpretation of results, or publication process.

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