

Farmers' Satisfaction Level with Hybrid Rice Seed Utilization in East Java, Indonesia: Evidence from Smallholder Farmers

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Abstract: Hybrid rice technology has been widely supported as a technique for increasing rice output and food security in many developing nations, including Indonesia. This study looked at smallholder farmers' satisfaction levels with hybrid rice seed use in Indonesia, and the elements that influence satisfaction across several dimensions such as technical performance, economic considerations, and risk perceptions. Primary data were acquired from 20 rice farmers via structured questionnaires. The data were examined with the Statistical Package for the Social Sciences (SPSS), which included descriptive statistics, reliability tests, and multiple linear regression analysis. Farmers were moderately satisfied with hybrid rice use, with average scores ranging from 2.70 to 3.00 on a five-point scale. Economic aspects, notably seed costs, obtained the lowest ratings (mean = 2.45), showing significant farmer worries about the initial investment requirements. Technical performance attributes earned moderate evaluations (2.80-3.00), whereas risk perceptions were moderate (2.65-2.90). All constructs showed acceptable to outstanding reliability (Cronbach's α : technical performance = 0.765, economic considerations = 0.727, risk perception = 0.814, and satisfaction = 0.916). Regression analysis found that technical performance and risk perception accounted for 51-56% of variation in farmer satisfaction ($R^2 = 0.563$, adjusted $R^2 = 0.512$, $F = 10.966$, $p = 0.001$). The Customer satisfaction index results show a value of 70.3%, indicating that farmers are typically satisfied with the use of hybrid rice seeds. Overall, the findings indicate that boosting economic accessibility and lowering production risks could increase farmer satisfaction and support further adoption of hybrid rice technology in the region.

Keywords: food security; Hybrid rice; Indonesia; Smallholder farmers.

I. INTRODUCTION

Rice is an important staple food crop in Indonesia, with West Java, Central Java, and East Java being the leading provinces in terms of production (Maulidia & Suminartika, 2019). As one of the world's major rice producers and consumers, Indonesia continues to prioritize boosting rice yield to satisfy the needs of its rising population and assure secure food supplies (Putra I., 2025). Because of its vast population and dietary dependency on rice, Indonesia considers rice self-sufficiency as a crucial national food security goal (Suparman *et al.*, 2025). In 2023, the rice harvested area was 10.20 million hectares, with a production of around 53.63 million tons of dry milled grain, or the equivalent of 30.90 million tons of rice (BPS, 2023). However, both harvest area (-2.45%) and production (-2.05%) declined dramatically from the previous year. This fall was caused by a decrease in the margin between rice production and demand (Meylinah S., 2023). According to official BPS data, the harvested area decreased by 1.64% (about 167,250 ha) from 2023. The gap between domestic rice production and the nation's consumption demands was reduced as a result of this decrease in cultivated land and poorer yields, closing the production-demand margin. Indonesia has been forced to rely more on imports as a result in order to make up the difference. In 2023,

93% of Indonesia's 3.06-million-ton rice imports came from Thailand (45.1%), Vietnam (37.5%), and Pakistan (10.1%), covering a 0.07-million-ton supply shortage (Shobur M. *et al.*, 2024). Consequently, as a result, agricultural intensification measures, such as the promotion of high-yielding varieties and hybrid rice seeds, have been important to government initiatives aimed at increasing rice output and ensuring sustained food availability for its population (Grimm & Luck, 2020).

Indonesia has pursued hybrid rice as a means to increase productivity and improve grain quality. Hybrid rice varieties have the genetic potential to surpass traditional inbred cultivars by 15-30 percent, with proven productivity reaching 9-11 tons per hectare under optimal management conditions (FAO, 2014). In Indonesia, hybrid rice is grown on well-developed, irrigated paddy fields; the Indonesian Center for Rice Research recognized 33 districts/municipalities spanning Java and Bali as appropriate, totalling over 1.6 million ha (Sudaryanto T., 2018). Demonstration farms created across several locations have consistently showed hybrid rice output surpassing 9.6 tons per hectare, suggesting increases of over 100 percent compared to baseline farmer yields of around 5.4 tons per hectare (Mikhael *et al.*, 2025). Despite these advantages, overall adoption is limited due to seed availability, cost, and farmer views.

Smallholder farmers dominate rice production systems in Indonesia, notably in West Java, a key rice-producing province. Their adoption of agricultural innovations is affected not only by predicted production improvements, but also by perceived benefits, dangers, and general contentment with the technology (Romadi U. *et al.*, 2025). According to Prafitthiasari & Fathiyakan (2017), farmers evaluate hybrid rice varieties based on multiple factors, with production, pest resistance, and plant age ranked as the most relevant qualities driving variety choice. Demonstration farming initiatives, such as those adopted through the Integrated Participatory Development and Management of Irrigation Program, have aimed to speed technology adoption by allowing farmers to observe hybrid performance in person (Santoso, A. B. *et al.*, 2024).

Therefore, the purpose of this study is to evaluate the satisfaction levels of smallholder farmers in West Java, Indonesia, regarding the utilization of hybrid rice seeds in order to contribute to a better understanding of adoption dynamics for improved agricultural technology. Such an investigation is critical for guiding policy and outreach efforts meant to improve the acceptance of superior varieties and contribute to sustainable rice intensification in the region.

II. METHODOLOGY

1) Study area

The research was conducted in the heart of Watu Dakon, a village in the Kesamben District of Jombang city, East Java province which represents one of the nation's most significant rice-producing regions. The region has a wide range of agroecological zones, from lowland irrigated fields to upland rainfed systems, making it an ideal setting for studying hybrid rice usage under different conditions. It is crucial site in Indonesian rice production because of its ideal agroecological conditions and intensive rice planting practices. The area was chosen because hybrid rice seeds have been introduced and adopted by multiple farmers, making it an appropriate location to investigate farmers' contentment with this agricultural technology.

2) Research approach

This study used a quantitative research approach to assess farmers' satisfaction with the adoption of hybrid rice seeds. Farmers were asked to complete a standardized questionnaire using a Likert-scale evaluation. The quantitative technique was adopted to assess farmers' opinions and satisfaction levels, as well as to statistically investigate the relationship between various factors impacting the utilization of hybrid rice seeds.

3) Population and sample

The population of this study consisted of rice farmers who use hybrid rice seeds in the study area. A purposive sample strategy was employed to pick respondents who have used hybrid rice seeds before. A total of 20 farmers were chosen as respondents. The selected farmers have planted hybrid rice seeds for at least one growing season, allowing them to provide informed feedback on their experiences.

4) Data collection

Structured questionnaires were distributed directly to farmers to collect primary data. The questionnaire included items about farmers' perceptions of and satisfaction with hybrid rice seeds. A four-point likert scale was used to ask respondents to rate their degree of satisfaction.

TABLE I. Likert scale

Scale	Description
1	Dissatisfied
2	Quite satisfied
3	Satisfied
4	Very satisfied

The questionnaire included a number of indicators organized into distinct variables, such as technical performance, economic aspects, risk perception, and overall farmer satisfaction.

5) Research variables

The study included one dependent variable and three independent variables.

The Dependent Variable is the Farmers' Satisfaction (Y): these variable measures the overall level of satisfaction of farmers regarding the use of hybrid rice seeds.

We have three independent variables were selected based on theoretical considerations and previous empirical research. The first one is Technical Performance (X1): this variable evaluates farmers' perceptions of the agronomic performance of hybrid rice seeds, including germination rate, plant growth, resistance to pests and diseases, and yield performance. The second one is Economic Factors (X2): these variable measures farmers' satisfaction with the economic aspects of hybrid rice seeds, including seed price, input requirements, production costs, and profitability. The final one, Risk Perception (X3) which reflects farmers' perceptions of the risks associated with hybrid rice cultivation, including crop stability, resistance to climate variability, and vulnerability to pest attacks.

6) Data analysis

The collected data were analyzed using Statistical Package for the Social Sciences (SPSS) software version 16. Several statistical techniques were applied to analyse the data.

First, descriptive statistics were used to summarize the characteristics of respondents and to describe the average level of satisfaction for each variable. Second, a reliability test using Cronbach's Alpha was conducted to evaluate the internal consistency of the questionnaire items. Third, multiple linear regression analysis was used to examine the influence of the independent variables (technical performance, economic factors, and risk perception) on farmers' satisfaction with hybrid rice seeds. The regression model used in this study is expressed as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \epsilon$$

Where:

Y= Farmers' satisfaction

X₁= Technical performance

X₂= Economic factor

X₃= Risk perception

β_0 = Constant

$\beta_0, \beta_1, \beta_2, \beta_3$ = Régression coefficients

ε = Error term

The results of the regression analysis were interpreted using the coefficient of determination (R^2), F-test, and t-test to determine the significance and strength of the relationships between variables.

Finally, we calculated the Customer Satisfaction Index (CSI) which is a method for measuring the satisfaction level of the farmers as a whole to look at the importance of hybrid rice seeds. According to Simamora, B. (2004), This reference explains that customer satisfaction can be expressed as an index by comparing the mean score with the highest possible scale.

Formula used:

$$CSI = (\text{Mean Score} / \text{Highest Scale}) * 100$$

After calculating, farmers' satisfaction levels can be classified using CSI (Customer Satisfaction Index) criteria, as shown in the table 2.

TABLE II. The Criteria of Customer Satisfaction Index

CSI rating (%)	Interpretation
$0 < CSI \leq 34$	Dissatisfied
$35 < CSI \leq 50$	Less satisfied
$51 < CSI \leq 65$	Quite satisfied
$66 < CSI \leq 80$	Satisfied
$81 < CSI \leq 100$	Very satisfied

Source: Wicaksana, (2013)

III. RESULTS AND DISCUSSION

1) Descriptive statistics of the study variables

Descriptive statistics were used to investigate farmers' attitudes about hybrid rice seeds in terms of technical performance, economic aspects, risk perception, and overall satisfaction. They are presented in Table 3.

a) Farmers' perceptions of the technical performance of hybrid rice seeds

The descriptive analysis reveals that farmers were generally moderately to highly satisfied with the technical performance of hybrid rice seeds. The four indicators had mean values ranging from 2.80 to 3.00 on a four-point Likert scale. The survey's highest mean (3.00) demonstrates farmers' overall satisfaction of hybrid rice's key technical features, particularly its increased grain production and disease resistance, which are frequently highlighted in field research. Adoption of hybrid rice in southern China increased grain yields by 4.86% and net rice income compared to conventional varieties (Yan Z. *et al.*, 2022). Farmers in the Philippines Favor high-yielding, fast-maturing types with good grain quality (Laborte A. *et al.*, 2015). The lowest mean (2.80) indicates modest discontent with specific agronomic characteristics. In Indonesia, farmers rated the overall performance-importance match of the hybrid seed Mapan P-05 at 80.2 %, but indicated only 62 % overall satisfaction, reflecting worries about availability and management complexity (Wahyuni S. *et al.*, 2018).

b) Economic factors associated with hybrid rice seed use

Economic issues influence farmers' views toward agricultural innovations. The descriptive statistics show that

the mean scores for economic aspects ranged between 2.45 and 3.10. The survey's highest mean (3.10) indicates that farmers have a generally positive assessment of hybrid rice's economic benefits. Hybrid rice adoption increases net income and grain yield, leading to higher marketable output and profit per hectare. For instance, according to Yan Z. *et al.*, (2022), chinese farm-level data documented a significant increase in net income after hybrid adoption, while U.S. studies reported a clear profit-per-hectare advantage for hybrids over conventional varieties (Mirsky J. A. *et al.*, 2016). In India, hybrid rice had a greater benefit-to-cost ratio (1.80) than traditional basmati (1.20), indicating higher profitability despite higher seed costs (Prakash A. *et al.*, 2017). The lowest mean (2.45) indicates significant farmer worries, most likely due to the expensive expense of hybrid seed. Several evaluations identified seed price as a primary cost driver: hybrid seed elevates total production costs by 28-35% relative to inbred varieties, may negate profitability improvements (Harun M. E. *et al.*, 2003). Hybrid rice has greater intermediate input costs (fertilizer, water, labor) without proportional value-added, which strains farm budgets (Nguyen Chau & Scrimgeour, 2022).

c) Farmers' risk perception toward hybrid rice cultivation

Another significant aspect affecting farmers' happiness with agricultural technologies is their perception of risk. The findings show that farmers' satisfaction levels were modest, with mean values for risk perception markers ranging from 2.65 to 2.90. Farmers' risk assessments of hybrid rice seeds are modest, indicating that they are cautious. They recognize hybrid rice's potential but remain cautious about uncertainties: differentiation among risk types necessitates targeted policy interventions; strengthening extension services to reduce institutional risk; stabilizing market prices to mitigate price risk; and providing technical support and resilient varieties to reduce production risk (Shah & Stocklmayer, 2015). Research on rice growers in eastern India found that risk-attitude scores differ significantly, with risk-averse farmers less likely to adopt capital-intensive technology like hybrids (Patil & Veetil, 2024). A spatial-econometrics examination of hybrid rice adoption in Bangladesh found that farmers prioritize institutional risks (such as unreliable seed markets and regulatory uncertainty) over yield and pricing concerns when making adoption decisions (Pervez A. *et al.*, 2021).

d) Satisfaction level of smallholder farmers

Overall, farmers were moderately satisfied with hybrid rice utilization across all four metrics. These satisfaction levels are far lower than one might expect considering the proven yield potential of hybrid rice varieties, which can reach 9-11 tons per hectare with proper management (Mikhael *et al.*, 2025). The disparity between technological potential and farmer happiness indicates that factors other than raw productivity such as production costs, grain quality, market pricing, and cultivation complexity have a substantial impact on farmers' overall satisfaction with hybrid rice technology. The moderate satisfaction levels observed are consistent with findings from demonstration activities in Ciarnis District, where Hipa 21 hybrid varieties achieved 9.6 tons per hectare but farmer feedback highlighted ongoing challenges related to irrigation,

pest management, and the learning requirements associated with hybrid seed systems (Julian, 2022). This pattern emphasizes the necessity of viewing satisfaction as a

multidimensional term that includes farmers' overall evaluations of technology performance across numerous aspects, rather than just yield comparisons.

TABLE III. Descriptive statistics of the variables

	N	Minimum	Maximum	Mean	Std. Deviation
Technical performance (X1_1)	20	2.00	4.00	2.9500	0.75915
Technical performance (X1_2)	20	2.00	4.00	3.0000	0.64889
Technical performance (X1_3)	20	2.00	4.00	2.9000	0.71818
Technical performance (X1_4)	20	2.00	4.00	2.8000	0.76777
Economic factor (X2_1)	20	1.00	3.00	2.4500	0.60481
Economic factor (X2_2)	20	2.00	4.00	2.6000	0.59824
Economic factor (X2_3)	20	2.00	4.00	3.1000	0.78807
Economic factor (X2_4)	20	2.00	4.00	2.7000	0.73270
Risk perception (X3_1)	20	2.00	4.00	2.8000	0.76777
Risk perception (X3_2)	20	2.00	4.00	2.8000	.61559
Risk perception (X3_3)	20	2.00	4.00	2.9000	0.71818
Risk perception (X3_4)	20	1.00	4.00	2.6500	.81273
Satisfaction level (Y_1)	20	2.00	4.00	2.8000	0.69585
Satisfaction level (Y_2)	20	2.00	4.00	3.0000	0.79472
Satisfaction level (Y_3)	20	2.00	4.00	2.7000	0.73270
Satisfaction level (Y_4)	20	2.00	4.00	2.7500	0.78640
Valid N (listwise)	20				

2) Reliability of the measurement instruments

The reliability analysis indicates that the questionnaire used in this study has strong internal consistency. It was assessed using Cronbach's alpha coefficients for each construct and are shown in Table 4.

TABLE IV. Reliability test for technical performance variables (X1), economic factor variables (X2), risk perception variables (X3) and satisfaction level (Y)

Variables	Cronbach's Alpha	Standard	Remarks
Technical performance (X1)	0.912	0.6	Reliable
Economic factors (X2)	0.727	0.6	Reliable
Risk perception (X3)	0.814	0.6	Reliable
Satisfaction level (Y)	0.916	0.6	Reliable

Source: Processing via SPSS version 16

The Cronbach's alpha for the technical performance construct, which included four items, was 0.912, showing strong internal consistency. This number indicates that the four technical performance indicators accurately capture the underlying construct of farmers' perceptions of hybrid rice technical qualities. The reliability coefficient confirms the validity of employing the composite technical performance measure in further regression analysis.

The economic factors construct demonstrated satisfactory reliability, with a Cronbach's alpha of 0.727. While lower than the other constructs, this value is still within the acceptable range for exploratory study and demonstrates that the four economic indicators accurately capture farmers' economic appraisals of hybrid rice technology.

Risk perception showed good reliability, with a Cronbach's alpha of 0.814 indicating strong internal consistency across the four items. This strong reliability shows that farmers react coherently to questions about the various elements of risk connected with hybrid rice growing, which supports the construct validity of the risk perception scale.

The satisfaction construct has great dependability, with a Cronbach's alpha of 0.916, which exceeded the suggested

standard. This very high alpha coefficient suggests that the four satisfaction indicators are highly consistent in assessing farmers' overall contentment with hybrid rice use. The dependent variable measure's high reliability increases trust in the regression results and shows that farmers' satisfaction evaluations are logical and internally consistent.

These results exceed the widely accepted threshold of 0.70, indicating that the measurement items used to assess each variable are trustworthy and appropriate for statistical analysis (Hair et al., 2022). High reliability scores imply that the questionnaire items regularly measure the same underlying constructs and give reliable data for assessing farmers' perceptions. These reliability findings are consistent with prior agricultural technology adoption studies in Indonesia. The alpha coefficients found are higher than those reported in similar research (Rusyadi, 2014), indicating that the measurement instruments used in this work have strong psychometric qualities.

3) Influence of technical performance and risk perception on farmers' satisfaction

Multiple linear regression analysis was conducted to identify factors significantly associated with farmers' satisfaction levels regarding hybrid rice seed utilization. The results are demonstrated in Table 5, 6, 7 and 8.

TABLE V. Model summary results

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.751 ^a	0.563	0.512	0.47026

Source: Processing via SPSS version 16

a. Predictors: (Constant), Risk perception means (X3), Technical performance means (X1)

The regression model accounted for a significant amount of the variation in farmer satisfaction. The model produced an R² value of 0.563 and an adjusted R² of 0.512, as indicated in Table 3, suggesting that technical performance and risk perception together explain for roughly 51-56 percent of the

difference in farmers' contentment with hybrid rice consumption. 56.3% of the variation in farmers' satisfaction can be explained by the independent variables included in the model. This explanatory power is significant for cross-sectional survey research in agricultural contexts, because multiple unmeasured factors (farm-specific conditions, weather changes, household characteristics) frequently influence farmer results. The ANOVA analysis gave the following results in Table 6.

Based on the ANOVA results, the F-statistic of 10.966 ($p = 0.001$) demonstrates that the regression model is statistically significant, implying that the combined effect of the predictor variables accurately explains variance in the dependent variable and indicating that the independent variables jointly contribute to explaining farmers' satisfaction with hybrid rice seeds. The model's significance at $p < 0.01$ suggests that

technical performance and risk perception are important predictors of farmer satisfaction with hybrid rice technology. The results of Individual Predictor Effects are showed in Table 7.

TABLE VI. ANOVA^b results

Model	Sum of Squares	df	Mean Square	F	Sig.	
1	Regression	4.850	2	2.425	10.966	0.001 ^a
	Residual	3.759	17	.221		
	Total	8.609	19			

Source: Processing via SPSS version 16

a. Predictors: (Constant), Risk perception means (X3),

b. Technical performance means (X1)

Dependent Variable: Satisfaction level means (Y)

TABLE VII. Coefficient^a results

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	
	B	Std. Error	Beta			
1	(Constant)	0.417	0.525		0.793	0.439
	Technical performance means (X1)	0.385	0.410	0.369	0.937	0.362
	Risk perception means (X3)	0.458	0.452	0.399	1.013	0.325

Source: Processing via SPSS version 16

a. Dependent Variable: Satisfaction level means (Y)

TABLE VIII. Excluded variables^b

Model	Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
					Tolerance
1	Economic factor means (X2)	. ^a	.	.	0.000

Source: Processing via SPSS version 16

a. Predictors in the Model: (Constant), Risk perception means (X3), Technical performance means (X1)

b. Dependent Variable: Satisfaction level means (Y)

Table 7 shows that neither technical performance ($\beta = 0.369$, $t = 0.937$, $p = 0.362$) nor risk perception ($\beta = 0.399$, $t = 1.013$, $p = 0.325$) reached conventional levels of statistical significance ($p < 0.05$) when considered individually. John Michael Riveros Gavilanes. (2017) revealed that regression models with modest sample sizes ($N = 6, 10, 20$) frequently produce unstable coefficients and non-significant outcomes. Another explanation is that multicollinearity between technical performance and risk perception can increase standard errors, making individual coefficients less exact. While tolerance numbers were satisfactory, it is reasonable to expect some association between two conceptually linked constructs—farmers who experience superior technical performance may perceive fewer risks, and vice versa. According to GeeksforGeeks (2025), the multicollinearity arises when predictor variables are correlated, leading to issues in regression analysis because it undermines independence assumptions.

The importance of the regression model suggests that technical performance and risk perception are important components of the farmer's decision-making framework. The positive coefficients for both variables show that as technical outcomes (such as yield or grain quality) improve and farmers become more proficient at managing associated risks, their

overall happiness with hybrid seeds rises (Hassan, M. *et al.*, 2025).

The analysis of excluded factors (Table 8) reveals more information. Economic components (X2) were excluded from the regression model, suggesting that they did not match the tolerance criteria for inclusion. This suggests that farmers' judgments of the technology's performance and related hazards are closely related to their economic assessments of hybrid rice seeds rather than being separate factors. Prior studies on the adoption of agricultural technology have also shown that, rather than analyzing costs and returns independently, farmers usually evaluate economic benefits indirectly through anticipated productivity gains and perceived risk reduction (Zegeye, M. B. *et al.*, 2022). For instance, research on the adoption of rice technology reveals that farmers' choices are heavily impacted by anticipated yield increases and the benefits of risk avoidance, which ultimately decide perceived economic advantages (Vikram & Prakashan, 2024). It also agrees with research revealing that farmers' returns to hybrid rice adoption are very variable, with economic outcomes depending on how well technology traits correspond with farm-specific conditions and farmer capabilities (Jaweriah H. *et al.*, 2025).

4) Customer Satisfaction Index (CSI)

Customer Satisfaction Index (CSI) is a measurement tool to know the level of overall satisfaction of a product and the results are presented in Table 9.

TABLE IX. Customer Satisfaction Index result

Average score of satisfaction level (Y)	2.81
Maximum scale	4
Customer Satisfaction Index (%)	70.3

The Customer Satisfaction Index (CSI) was calculated to determine the overall level of farmers' satisfaction with hybrid rice seeds. Based on the analysis, the CSI value was 70.3% ranged between $66 < CSI \leq 80$ which falls into the satisfied category. This result indicates that farmers generally have a positive perception of hybrid rice seeds, particularly in terms of productivity, seed performance, and economic benefits. The CSI approach is extensively used in agricultural satisfaction studies to assess composite satisfaction levels (Noerhatini *et al.*, 2025). According to Responsly (2025), CSI gives a more comprehensive measure of satisfaction than single-item metrics because it incorporates numerous variables into a single index.

Based on the analysis, the CSI value was 70.3% ranged between $66 < CSI \leq 80$ which falls into the satisfied category. This result indicates that farmers generally have a positive perception of hybrid rice seeds, particularly in terms of productivity, seed performance, and economic benefits. The 70.3 percent CSI obtained in this study suggests that hybrid rice technology has usually exceeded farmer expectations across all measured parameters. However, it is worth noting that this satisfaction level is slightly lower than the 72-78% range observed in several comparable research. This disparity may represent the specific issues faced by farmers in West Java, such as economic concerns (especially seed costs) and risk perceptions reported in the regression study. As stated in prior study, the CSI value is a useful benchmark for stakeholders to evaluate technology performance and highlight areas that require development (Sasmi M. *et al.*, 2024). The results indicate that although farmers are generally satisfied, there is still potential for improvement, especially in areas where individual satisfaction ratings were lower. By using the Customer Satisfaction Index (CSI) for ongoing monitoring, seed companies, extension services, and legislators can quickly identify changes in farmer mood. CSI is used by seed firms like Bintang Asia to benchmark product quality (CSI = 82.35% good) and pinpoint characteristics that need to be preserved or enhanced (Sulistiyono S. *et al.*, 2023). In order to assess service effectiveness and identify priority areas for improvement, agricultural extension services also use CSI (for example, a CSI of 65.6% indicates "quite satisfied" farmers in Purwosari) (Mushoddaq A. *et al.*, 2023). These stakeholders can monitor changes over time, identify new issues, and modify production, outreach, or policy interventions by routinely updating CSI scores.

IV. CONCLUSION

This study investigated farmers' satisfaction with the usage of hybrid rice seeds in West Java, Indonesia, by examining the impact of technical performance, economic variables, and risk

perception. The descriptive results show that farmers were generally moderately to very satisfied with the use of hybrid rice seeds. Farmers, in particular, had reasonably high opinions of hybrid rice seeds' technical performance, which included plant growth, pest and disease resistance, and future production. Economic variables also influenced farmer satisfaction. Although farmers accepted that hybrid rice farming can yield sufficient returns, some respondents expressed concern about the comparatively high cost of hybrid seeds and input needs. The reliability analysis indicated that the questionnaire employed in this study had acceptable to excellent internal consistency, implying that the measurement instruments were appropriate for assessing farmers' views and satisfaction. Furthermore, the regression analysis demonstrated that technical performance and risk perception account for a significant amount of the difference in farmer satisfaction. The individual effects of these variables were not statistically significant, possibly due to the study's small sample size and the multicollinearity between technical performance and risk perception. Moreover, the Customer Satisfaction Index (CSI) analysis found that farmers have a generally positive perception, with a CSI value of 70.3%. Overall, the data indicate that hybrid rice seeds have the potential to increase farmers' production and pleasure. Nonetheless, boosting farmer happiness and encouraging further adoption of hybrid rice technology would necessitate resolving economic restrictions and lowering perceived production risks. Strengthening agricultural extension services, expanding access to low-cost inputs, and giving technical training to farmers could improve the effectiveness and sustainability of hybrid rice farming in the region.

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