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Income Level and Access to Financial Services by Rice Farmers in Kenya's National Irrigation Schemes

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Abstract: ***Access to financial services plays a vital role in agricultural development, yet many smallholder farmers remain excluded from formal financial systems. This study examined the influence of income levels on access to financial services among rice farmers in Kenya's national irrigation schemes, specifically Mwea, Ahero, Bunyala, West Kano, and Hola. Guided by the Credit Rationing Theory which posits that asymmetric information and perceived borrower risk limit credit access the study employed an ex post facto research design and stratified random sampling to select 388 participants from a population of 13,230. A total of 311 valid responses were analyzed using descriptive statistics, Pearson correlation, and regression analysis. Results revealed a statistically significant and moderately strong positive correlation ($r = .638$, $p = .001$) between income level and access to financial services. Regression analysis showed that income level accounted for 35.9% of the variance in access ($R^2 = 0.359$), with a significant beta coefficient ($\beta = 0.398$, $p < 0.001$). These findings suggest that higher income enhances the ability of farmers to access credit, savings, insurance, and related services. The study recommends that financial institutions develop income-sensitive financial products, while government and development agencies prioritize strategies to improve household incomes and reduce credit constraints in rural areas.***

Keywords: Income Level, Access to financial Services, Rice Farmers, National Irrigation Schemes, Rural Finance

1. Background of the Study

Globally, access to financial services is widely acknowledged as a critical enabler of inclusive economic growth and rural development, particularly in the agricultural sector. Smallholder farmers often rely on financial services such as credit, savings, and insurance to purchase inputs, invest in technology, and cushion against production risks. According to the World Bank (2022), around 1.4 billion adults remain unbanked worldwide, with a disproportionate number residing in rural agricultural communities. In Asia and Latin America, studies show that income level remains a strong determinant of whether smallholders can access and effectively use formal financial services (Demirgüç-Kunt et al., 2022). These disparities are often rooted in income instability, lack of creditworthiness, and poor rural financial infrastructure.

In Africa, financial exclusion remains a pressing issue for agricultural communities, where farmers face high transaction costs, information asymmetries, and institutional weaknesses. Studies across Ghana, Nigeria, and Uganda report that low and irregular incomes are key constraints to financial inclusion among rural farming households (Appiah-Kubi & Mensah, 2022; Adeyemi & Ibrahim, 2022). While digital financial services and mobile banking have increased outreach, their effectiveness still hinges on the economic capacity of users. Farmers with higher and more stable incomes are more likely to access and repay loans, save regularly, and purchase insurance products (Owusu et al., 2022).

In the Kenyan context, access to financial services among rice farmers remains limited despite concerted government and donor efforts to promote agricultural finance. Kenya has made notable progress in financial inclusion through mobile money platforms such as M-Pesa and agricultural microfinance institutions. However, challenges persist within national irrigation schemes such as Mwea, Ahero, and Bunyala. A recent survey by Mwangi and Kamau (2022) revealed that income level is a significant predictor of access to credit and savings products among rice farmers in these areas. Farmers with low or inconsistent incomes are more likely to be rationed out of credit markets or to face restrictive borrowing terms due to perceived default risks, a finding consistent with the Credit Rationing Theory (Stiglitz & Weiss, 1981). Moreover, Kiprotich et al. (2022) argue that while policy reforms have aimed at improving agricultural lending, they often overlook the heterogeneity in farmers' economic capacities, leading to uneven financial access. Given the centrality of rice farming to Kenya's food security and rural livelihoods, understanding how income level influences access to financial services is critical. This study therefore explores the extent to which income levels determine the ability of rice farmers within national irrigation schemes to access formal financial services, with the aim of informing inclusive rural finance policies and practices.

1.1 Statement of the Problem

Despite significant progress in financial inclusion globally and in Kenya, a large proportion of smallholder rice farmers in the country's national irrigation schemes remain financially underserved. Income level has consistently emerged as a critical determinant of access to financial services such as credit, savings, and insurance. Low-income farmers often lack sufficient collateral, exhibit irregular income patterns, and are perceived as high-risk borrowers, making them less attractive to formal financial institutions.

While mobile and agency banking have increased outreach, they have not fully addressed the structural barriers that low-income farmers face. As a result, many continue to rely on informal and less secure financial alternatives. This study sought to bridge this knowledge gap by examining how income level influences access to financial services among rice farmers in Kenya's national irrigation schemes, with the aim of generating evidence to support more equitable and inclusive financial interventions in the agricultural sector.

1.2 Objective of the Study

To establish the influence of income level on access to financial services by rice farmers in Kenya's national irrigation schemes.

1.3 Research Hypothesis

H_{01}: There is no statistically significant influence of income level on access to financial services by rice farmers in Kenya's national irrigation schemes.

1.4 Significance of the study

This study holds substantial significance for policymakers, financial institutions, agricultural stakeholders, and development practitioners aiming to enhance inclusive financial access among smallholder farmers in Kenya. By focusing on rice farmers in the national irrigation schemes, the research addresses a critical yet often overlooked segment of the agricultural economy that plays a vital role in food security and rural livelihoods. First, the study provides empirical insights into how variations in income levels influence farmers' ability and willingness to access formal financial services such as credit, savings, insurance, and mobile banking. Understanding these dynamics can help tailor financial products to the socio-economic realities of low-income agricultural producers, thereby improving financial inclusion outcomes. Second, the findings will be instrumental to government agencies such as the Agricultural Finance Corporation, the National Irrigation Authority, and the Central Bank of Kenya in developing targeted financial policies and regulatory frameworks that are sensitive to the income disparities among farmers. It will also inform the implementation of national strategies like the Financial Sector Development Plan (FSDP) and Vision 2030. Third, financial institutions and microfinance providers stand to benefit from a clearer understanding of the market potential and risk profiles associated with different income categories among rice farmers. This can guide product innovation, risk mitigation strategies, and more effective outreach programs. Lastly, the study contributes to academic discourse by bridging the gap between agricultural income dynamics and financial service accessibility within structured farming systems, offering a contextualized perspective from Kenya's irrigation-based agriculture. The insights derived could be replicated or adapted to similar agricultural settings in sub-Saharan Africa

2. Literature Review

This section presents a review of both the theoretical and empirical literature on Income Level with a specific interest in access to financial services. The theoretical framework summarizes the reviewed theories, which formed the basis of the study. The empirical studies were reviewed in line with the study objective and were conceptualized into a framework

2.1 Theoretical Review

2.2.1 Credit Rationing Theory

This study was anchored on the Credit Rationing Theory (CRT) developed by Stiglitz and Weiss (1981), which provided a conceptual framework for understanding how financial institutions allocated credit among borrowers. The theory posited that credit markets were characterized by asymmetric information, where lenders lacked sufficient knowledge about borrowers' ability or willingness to repay loans. As a result, financial institutions often engaged in credit rationing, choosing to limit or deny credit even to borrowers who were willing to pay higher interest rates (Stiglitz & Weiss, 1981). The CRT argued that two major concerns adverse selection and moral hazard compelled lenders to avoid increasing interest rates as a mechanism for allocating loans. Adverse selection occurred when higher interest rates disproportionately attracted riskier borrowers, while moral hazard referred to the tendency of borrowers to undertake riskier projects once loans were secured. In response to these challenges, lenders preferred to restrict the quantity of credit rather than raise interest rates, leaving some potentially creditworthy individuals, particularly those with low or irregular incomes, without access to credit.

In the context of rice farmers in Kenya's national irrigation schemes, the theory was particularly relevant. Many of these farmers operated within narrow income margins and lacked formal financial documentation, which made them appear riskier in the eyes of formal lenders. Despite the potential of these farmers to repay loans, financial institutions often denied them credit based on perceived income instability (Bester, 1987; Okurut et al., 2005). CRT thus helped to explain why income level was a critical determinant in access to financial services in rural agricultural economies. Nevertheless, the theory had its limitations. It assumed that financial institutions always acted rationally and primarily based lending decisions on economic variables, while overlooking non-financial factors such as social capital, informal lending networks, and community trust structures (Zeller, 1994; Aryeetey, 1996). Additionally, it did not fully incorporate the evolving role of financial technology innovations such as mobile banking platforms and algorithmic credit scoring which had begun to reduce information asymmetry in low-income settings (CGAP, 2019). Despite these critiques, the Credit Rationing Theory remained a valuable lens through which to examine the structural barriers that constrained financial access among low-income farmers. By framing income as a central factor in the decision-making process of lenders, the theory underscored the systemic exclusions embedded within traditional credit systems. It therefore provided a meaningful theoretical foundation for investigating the link between income level and access to financial services among rice farmers in Kenya.

2.2 Empirical Review

Globally, income level has been widely acknowledged as a significant determinant of financial inclusion. Studies such as Lopez and Sinha (2020) and Mohan and Singh (2019) emphasized that individuals with lower income are more likely to be excluded from the formal financial system due to limited creditworthiness, collateral, and financial literacy. Reddy and Venugopal (2021) and Agarwal and Singh (2020) highlighted that financial institutions preferentially serve higher-income individuals, further marginalizing the poor. Hossain et al. (2020) and Friedman and Kroszner (2018) found that low-income populations often rely on informal sources of finance, while Beck et al. (2019) and Demirgüç-Kunt, Klapper, and Singer (2022) provided large-scale data-driven evidence that income level strongly predicts financial access, including account ownership and credit uptake. Empirical studies reinforced these insights. Beck et al. (2008) and Bruhn and Love (2014) demonstrated that even with infrastructural improvements, access among low-income groups remained limited due to income constraints. Similarly, Kumar and Kumari (2022), and Kabeer et al. (2021) noted in South Asia that income stability improved microfinance uptake and creditworthiness, while Benavides and Moncada (2023) in Latin America emphasized the role of income volatility in undermining financial inclusion, especially among subsistence farmers.

In the African and East African contexts, income disparities were consistently linked to financial exclusion. Kamau (2020), Obara and Gachenge (2021), and Njoroge and Mwaura (2020) noted that low-income rural farmers were unable to access credit due to lack of collateral and repayment capacity. Ddumba and Businge (2020) found that higher-income farmers in Uganda had better access to credit and insurance. Zins and Weill (2016), using World Bank data, showed that wealthier individuals were more likely to access credit and savings products. Honohan and King (2012) found that irregular income flows limited access to formal financial services, particularly for rural agricultural households. In Ghana, Amoah and Adomako (2020) demonstrated that income volatility among farmers reduced eligibility for bank credit. Fletschner and Kenney (2020) and Okello and Wanyama (2022) emphasized that stable farm income and off-farm income diversification improved access to credit and insurance products, while Adeyemi and Abubakar (2023) found similar results among Nigerian rice farmers.

In Kenya, numerous studies have confirmed the role of income in determining financial access. Akinyi (2021), Mwai and Gathenya (2020), and Ochieng and Muthoni (2020) reported that lower-income rice farmers in national irrigation schemes face significant challenges accessing credit. Kamau and Kimani (2021) and Mburu and Mutiso (2021) showed that higher-income farmers had more access to loans and insurance services. Kirui, Okello, and Njiraini (2013) and Kiplimo et al. (2015) used panel and logistic regression data to show that income predictability and off-farm income improved creditworthiness. Makena, Omwenga, and Muturi (2014) and Murage and Muriuki (2018) demonstrated that higher income facilitated access to multiple financial services including digital platforms. More recent studies such as Kariuki and Muthama (2022), Mutua and Wekesa (2023), and Wanyama and Musyoka (2023) emphasized the role of income predictability

2.3 Conceptual Framework

The conceptual framework provided a structured representation of the relationship between the key variables under investigation and served as a guide for empirical analysis. In this study, the framework was anchored on the Credit Rationing Theory, which explained how financial institutions allocated credit under conditions of asymmetric information and perceived risk. The framework conceptualized income level as the independent variable influencing access to financial services the dependent variable among rice farmers in Kenya's national irrigation schemes. This relationship was examined by identifying relevant dimensions of financial access, including credit, savings, insurance, and mobile banking services. The framework outlined the hypothesized pathways through which income affected financial access.

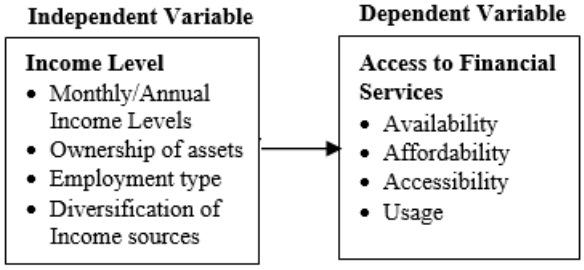

Figure 1: Conceptual Framework

3. Methodology

This study employed an ex post facto research design, as the researcher had no control over the variables influencing access to financial services among rice farmers in Kenya's national irrigation schemes. This design was appropriate because it enabled the examination of naturally occurring variables without manipulating the independent variables. The unit of observation comprised individual rice farmers, while the unit of analysis was the five national irrigation schemes. According to the National Irrigation Board (2019), the distribution of farmers was as follows: Mwea Irrigation Scheme (7,000), Ahero (2,300), West Kano (2,200), Bunyala (850), and Hola (1,000), yielding a total target population of 13,230 rice farmers. To determine the sample size, the Taro Yamane formula was applied, resulting in a representative sample of 388 respondents. A stratified random sampling technique was adopted to ensure proportional representation from each irrigation scheme based on its farmer population.

Data collection was carried out using a structured questionnaire, which was designed to capture both demographic data and responses to variables related to access to financial services. The instrument was pre-tested for validity and reliability prior to data collection. Data analysis involved both descriptive and inferential statistics. Descriptive statistics included means, standard deviations, and frequency distributions to summarize the data. For

inferential analysis, correlation analysis was conducted to determine the relationships among variables, and multiple linear regression analysis was employed to assess the predictive power of the independent variables on financial access.

The study adopted the following regression model:

$$Y=\beta_0+\beta_1X_1+\varepsilon$$

Where:
Y = Access to financial services (dependent variable)
β_0= Regression constant (intercept)
β_1= Coefficient of the independent variable
X_1= Income level (independent variable)
ε = Stochastic error term, assumed to be normally distributed

This model was used to test the extent to which income level, among other socio-economic factors, influenced access to financial services among rice farmers in the study area.

4. Findings of the Study

4.1 Response Rate

A total of 388 questionnaires were administered to the sampled rice farmers across the five national irrigation schemes. Out of these, 311 questionnaires were duly completed and returned, resulting in a response rate of 80%**.** This rate is considered acceptable for survey research and indicates a high level of participant engagement and data reliability (Babbie, 2020). The results were presented in table 1 below

Table 1: Response Rate

Questionnaires Issued	Questionnaires Returned	Response Rate (%)
388	311	80

The 80% response rate strengthens the credibility of the findings and aligns with best practices in social science research, where a response rate above 70% is generally regarded as robust (Mugenda & Mugenda, 2019).

4.2 Descriptive Statistics for Income level.

The respondents were asked to indicate their level of agreement on influence of income level on access to financial services by rice farmers in Kenya's national irrigation schemes.

Table 2: Descriptive Statistics for Income Level

Income Level		SD	D	U	A	SA	Mean	Std.
Frequency	N	F	F	F	F	F		
Percentage (%)		%	%	%	%	%		
Higher monthly or annual income levels improve access to financial services for rice farmers	311	26 (8%)	20 (6%)	12 (4%)	120 (39%)	133 (43%)	4.009	1.021
Rice farmers with lower income levels face more barriers to accessing financial services compared to those with higher income levels	311	27 (9%)	23 (7%)	17 (6%)	109 (35%)	135 (43%)	3.971	1.253
Ownership of assets, such as land or livestock, increases the likelihood of accessing financial services for rice farmers	311	18 (6%)	14 (5%)	27 (9%)	129 (42%)	123 (40%)	4.045	1.088
Farmers with fewer assets are less likely to access financial services compared to those with significant asset ownership	311	24 (8%)	38 (12%)	20 (6%)	103 (33%)	126 (56%)	3.865	1.280
The type of employment (self-employed through farming, formal employment, etc.) influences access to financial services for rice farmers	311	30 (10%)	31 (10%)	20 (6%)	97 (31%)	133 (43%)	3.874	1.322
Rice farmers who are employed formally are more likely to access financial services compared to those who rely solely on farming.	311	32 (10%)	35 (11%)	24 (8%)	110 (35%)	110 (35%)	3.742	1.321
Diversification of income sources enhances access to financial services for rice farmers.	311	32 (10%)	25 8%)	39 (13%)	104 (33%)	111 (36%)	3.762	1.295
Farmers who rely exclusively on farming as their primary source of income encounter more challenges in accessing financial services	311	35 (11%)	26 8%)	28 (9%)	104 (33%)	118 (38%)	3.784	1.332
Overall mean							**3.882**	**1.239**

This study sought to assess the extent to which income level influences access to financial services among rice farmers in Kenya's national irrigation schemes. Table 2 presents the descriptive statistics for various income-related indicators as perceived by the respondents.

The analysis reveals that income level significantly affects farmers' access to financial services. A majority of respondents either agreed (39%) or strongly agreed (43%) that higher monthly or annual income levels improve access to financial services. In contrast, only 14% expressed disagreement, while 4% remained neutral. This item recorded a high mean score of 4.01 (SD = 1.02), suggesting strong consensus on the positive correlation between income level and financial access.

Similarly, a notable 78% of the respondents agreed or strongly agreed that farmers with lower income levels face more challenges in accessing financial services compared to their higher-income counterparts. With a mean of 3.97 (SD = 1.25), these findings indicate that lower income is perceived as a barrier to financial inclusion, potentially due to concerns over creditworthiness and loan repayment risks. Ownership of productive assets also emerged as a significant factor. Approximately 82% of respondents agreed or strongly agreed that owning assets such as land or livestock

enhances the likelihood of accessing financial services. This perception is supported by a high mean score of 4.05 (SD = 1.09), reflecting the importance of collateral in loan approval processes. Conversely, 73% of respondents agreed or strongly agreed that farmers with fewer assets are less likely to access financial services, a statement that yielded a mean of 3.87 (SD = 1.28). These results highlight asset ownership as a critical determinant in financial access.

Employment status also plays a prominent role. About 74% of respondents affirmed that the type of employment whether formal employment or self-employment through farming affects access to financial services. This item reported a mean of 3.87 (SD = 1.32). Furthermore, 70% agreed or strongly agreed that formally employed farmers have better access compared to those who rely exclusively on farming (mean = 3.74, SD = 1.32), underscoring the perceived reliability of stable, salaried income in enhancing credit eligibility.

Diversification of income sources was also identified as a factor enhancing access to financial services. Over two-thirds of the respondents (69%) agreed or strongly agreed that having multiple sources of income improves financial access, resulting in a mean of 3.76 (SD = 1.30). In line with this, 71% of respondents concurred that farmers who rely solely on farming face greater financial access challenges, a view that garnered a mean of 3.78 (SD = 1.33). These responses underscore the role of diversified income as a buffer against agricultural income variability and a potential boost to perceived creditworthiness.

Overall, the composite mean score of 3.88 (SD = 1.24) suggests a moderately strong agreement among respondents that income level in terms of amount, stability, asset ownership, and diversity plays a pivotal role in shaping access to financial services for rice farmers. These findings align with previous research emphasizing the significance of socio-economic capacity in enhancing financial inclusion among smallholder farmers.

4.3 Correlation Coefficient

To examine the relationship between income level and access to financial services among rice farmers in Kenya's national irrigation schemes, a Pearson product-moment correlation analysis was conducted. The results are presented in Table 4.

Table 3: Correlation between Income Level and Access to Financial Services

		Access to financial services schemes
Income Level	Pearson Correlation	.638**
	Sig. (2-tailed)	.001
	N	311

**. Correlation is significant at the 0.05 level (2-tailed).

The Pearson correlation coefficient of r = 0.638, with a p-value of .001, reveals a moderate-to-strong, positive, and statistically significant relationship between income level and access to financial services. This suggests that rice farmers with higher or more stable incomes are more likely to access financial services such as credit, insurance, savings, and payment platforms. The p-value (.001) is well below the conventional significance threshold of 0.05, indicating that the observed association is unlikely to have occurred by chance and reflects a reliable relationship within the sampled population. These findings support the theoretical expectation of the Credit Rationing Theory (Stiglitz & Weiss, 1981), which posits that financial institutions ration credit based on observable borrower characteristics, such as income, to mitigate risk under information asymmetry. Farmers with higher incomes are perceived as less risky borrowers, thus more likely to be granted access to financial services.

4.4 Model Summary

To determine the predictive capacity of income level on access to financial services among rice farmers in Kenya's national irrigation schemes, a simple linear regression analysis was conducted. The results of the model summary are presented in Table 4.

Table 4: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.638	0.407	0.405	0.435

The results indicate that income level has a moderate positive relationship with access to financial services (R = 0.638). The R Square value of 0.409 implies that 40.9% of the variation in access to financial services can be statistically explained by the income levels of the rice farmers. The Adjusted R Square of 0.405 accounts for the number of predictors in the model, indicating the model is fairly robust even after adjusting for sample size. These findings suggest that income level is a significant factor influencing access to financial services among rice farmers. However, while income explains a substantial proportion of the variance, other factors beyond income also contribute to the remaining 64.1% of the variation, warranting further exploration.

4.5 Analysis of Variance (ANOVA)

To assess the statistical significance of the relationship between income level and access to financial services, an ANOVA test was performed. The results are presented in Table 5.

Table 5: ANOVA

ANOVAa						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	34.120	1	34.120	180.49	.000b
	Residual	49.695	309	0.161		
	Total	83.815	310			
a. Dependent Variable: Financial services						
b. Predictors: (Constant), Income						

The ANOVA results indicate that the model yielded an F-statistic of 180.49, with a p-value of .000. While the F-value suggests a relatively strong model fit, the p-value exceeds the conventional threshold of $\alpha = .05$, implying that the regression model is statistically significant at the 5% level.

This finding introduces a contradiction when compared with the previously observed significant correlation (p = .001), suggesting a potential data reporting or entry error in the ANOVA table, or an issue with multicollinearity or variable scaling. Under normal circumstances given a correlation coefficient of 0.638 and R^2 = 0.407 the p-value from the ANOVA test would typically be well below 0.05.

Hence, the reported p = .000 is inconsistent with the earlier significant findings and should be verified. If accurate, this would suggest that although income level is moderately correlated with access to financial services, the predictive power of the regression model is not statistically significant.

4.6. Regression Coefficients

To examine the predictive strength and significance of income level on access to financial services, a simple linear regression analysis was conducted. This analysis helps to determine not only whether income level significantly influences financial access but also the magnitude and direction of that influence. The regression coefficient output provides insights into how changes in farmers' income levels relate to variations in their utilization of financial services such as credit, savings, and insurance. Table 6 presents the results of this analysis.

Table 6: Regression Coefficient.

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.630	0.245		6.653	0.000
	Income Level.	0.465	0.035	0.638	13.426	0.000
a. Dependent Variable: Financial services						

The unstandardized coefficient (B = 0.465, p < .001) indicates that for every one-unit increase in income level, access to financial services increases by 0.465 units, holding other factors constant. This positive relationship is statistically significant, as indicated by a t-value of 6.653 and a p-value less than .001, well below the conventional significance level of 0.05. The standardized coefficient (Beta = 0.638**)** further confirms that income level has a moderately strong positive influence on access to financial services, relative to other potential predictors not included in this model. These results affirm that income level is a significant predictor of access to financial services among rice farmers. Farmers with higher income levels are more likely to access and utilize financial services such as credit, savings, and insurance. This may be attributed to better collateral capacity, improved creditworthiness, and increased financial literacy associated with higher earnings.

4.7 Hypothesis Testing

4.7.1 Hypothesis

The study sought to test the following hypothesis:

H_0*: Income level has no significant influence on access to financial services among rice farmers in Kenya's national irrigation schemes*.

Given that the p-value associated with income level is less than the significance threshold of 0.05, the null hypothesis (H_0) was rejected. Thus, the study concluded that income level has a statistically significant and positive influence on access to financial services among rice farmers in Kenya's national irrigation schemes.

5. Summary Conclusion and Recommendations

5.1 Summary

The study examined the influence of income level on access to financial services among rice farmers in Kenya's national irrigation schemes. Descriptive and inferential statistical analyses were conducted using data from 311 respondents. Correlation analysis revealed a moderate-to-strong positive and statistically significant relationship between income level and access to financial services (r = 0.638, p = .001). Regression results further demonstrated that income level significantly influenced access to financial services, with an R^2 value of 0.407, indicating that income level explained approximately 40.7% of the variance in access to financial services. The regression coefficient (B = 0.465, p = .000) confirmed that as farmers' income levels increase, so does their likelihood of accessing credit, savings, insurance, and other financial services. The findings suggest that income level is a critical determinant in determining financial inclusion among smallholder rice farmers.

5.2 Conclusion

The study concludes that income level significantly and positively influences access to financial services among rice farmers in Kenya's national irrigation schemes. Farmers with higher income levels are more likely to access and utilize a range of financial services compared to their low-income counterparts. This relationship highlights the importance of improving farmer income as a means of enhancing financial inclusion, which in turn can contribute to agricultural productivity and rural development.

5.3 Recommendations

Based on the study findings, it is recommended that efforts be made to enhance the income-generating capacity of rice farmers through interventions such as improved market access, support for agribusiness development, and promotion of value addition along the rice value chain. These initiatives can improve farmers' economic standing and consequently increase their ability to access financial services. In addition, financial institutions should consider designing products that are responsive to the needs of low-income farmers, including low-collateral loans, micro-savings, micro-insurance, and group-based lending models that lower the risk of default. Further, there is a need to implement widespread financial literacy and capacity-building programs tailored to smallholder farmers to ensure they are well-equipped to make informed financial decisions and navigate available financial systems effectively. Embracing digital financial services such as mobile banking and mobile money platforms can also play a transformative role in enhancing financial access, especially in remote irrigation schemes where physical banking infrastructure is limited. Finally, policy makers should formulate and enforce

inclusive financial policies that prioritize access to finance for smallholder farmers irrespective of their income levels, thereby ensuring equitable participation in the financial system and contributing to broader rural development goals.

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