

Motivation for Adopting Clonal Coffee as a Strategy for Strengthening the Sustainable Economy of Kaongkeongkea Coffee Farmers in Buton Regency

Safrin Edy^{1*}, Muh. Askal Basir², Muhammad Alamsyah³

^{1,3} Faculty of Agribusiness Study Programs Agriculture Muhammadiyah University of Buton, Indonesia

² Government Science Study Program, Faculty of Social and Political Sciences, Muhammadiyah University of Buton, Indonesia

* Corresponding Author: safrinediumb@gmail.com

Article History

Received: 20-09-2026

Revised: 26-09-2026

Published: 30-09-2026

ABSTRACT

This study aims to analyze farmers' motivations for adopting clonal coffee and its implications for strengthening the sustainable economy of Kaongkeongkea Village, Pasarwajo District, Buton Regency. A descriptive-exploratory qualitative approach was employed, with informants selected purposively, including adopter and non-adopter farmers, farmer-group administrators, and agricultural extension officers. Data were collected through in-depth interviews, group discussions, field observations, and documentation and subsequently analyzed thematically. The findings identified six determinants of adoption: economic motivation, perceived benefits of the innovation, social and institutional influences, access to resources, adoption barriers, and orientation toward economic sustainability. Specifically, farmers adopted clonal coffee because it produced more abundant and uniform cherries, demonstrated greater disease resistance, reduced maintenance costs, and offered more stable income prospects. The success of pioneer farmers, support from farmer groups, seedling assistance, and extension services strengthened farmers' confidence and technical capacity. Conversely, limited capital, seedlings, market information, and concerns about potential failure led some farmers to adopt the innovation gradually. Clonal coffee adoption can strengthen economic sustainability by increasing productivity, improving farm efficiency, stabilizing income, enhancing product value, and reinforcing the economic resilience of farming households.

Keywords: *Clonal Coffee; Economic Sustainability; Farmer Income; Farmer Motivation; Innovation Adoption*

INTRODUCTION

Sustainable agricultural development is a key pillar in regional economic strengthening strategies, particularly in rural and island areas with limited economic diversification, such as

Buton Regency. In this context, the agricultural sector is positioned not only as a food provider but also as a strategic instrument for increasing household income, reducing poverty, and strengthening local economic resilience based on natural resources (Handayani & Anwar, 2020; Prasetyo et al., 2022; Sutrisno et al., 2021) . However, agriculture in the islands is generally still dominated by small-scale farming, subsistence to semi-commercial orientation, and limited access to innovation and guidance, which impacts low agricultural productivity and efficiency.

This situation is also reflected in community coffee farming in Buton Regency. In general, coffee farmers cultivate land less than one hectare, use inferior local seeds, and employ traditional cultivation systems with limited access to guidance. This situation results in relatively low and unstable coffee productivity, thus suboptimal contribution to increasing farmer incomes. However, the increasing demand for quality coffee in domestic and global markets opens up significant economic opportunities for coffee-producing regions if supported by appropriate cultivation innovations (Kurniawan et al., 2023; Rahmawati & Nugroho, 2022) .

One strategic innovation in the development of smallholder coffee is the use of cloned coffee. Agronomically and economically, cloned coffee offers advantages over local coffee, including higher and more stable productivity, crop uniformity, disease resistance, and potentially more consistent seed quality. These advantages give cloned coffee a relatively higher selling value and the potential to increase the overall efficiency of the coffee farming business (Nasution et al., 2022; Sari et al., 2021; Wahyuni et al., 2020) . With these characteristics, cloned coffee is seen as a crucial instrument in sustainably strengthening the farmer's economy.

However, empirical data shows that the adoption rate of cloned coffee among farmers remains relatively low. Most farmers have not yet adopted cloned coffee, although some are already aware of the innovation. This situation suggests that innovation adoption issues are not solely related to technology availability but are also influenced by non-technical factors such as social, economic, and psychological factors. Farmers are often hesitant to adopt innovations due to the perceived high risk of failure, limited capital, and a lack of experience and trust in new technologies.

From an innovation adoption perspective, farmer motivation is a key determinant influencing the decision to accept or reject an innovation. Farmer motivation reflects not only economic incentives in the form of expected income increases, but also perceptions of agricultural security, past experiences, social environmental influences, and institutional support such as farmer groups and extension services (Lestari et al., 2023; Prabowo & Haryanto, 2021) . Descriptive data indicate that expectations of increased income from cloned coffee are actually quite high, but on the other hand, perceived risk of failure and limited capital remain major inhibiting factors that weaken farmers' motivation to adopt this innovation.

This situation becomes even more complex in the context of an island region like Buton Regency, where limited access to information, markets, and financing exacerbates farmers' cautiousness in making innovation decisions. Several studies have shown that in situations with high levels of uncertainty, farmers tend to avoid risks and maintain familiar cultivation practices, even if they are less economically profitable (Iskandar & Putri, 2022; Rahman et

al., 2020) . Therefore, farmer motivation is a key variable bridging the technical potential of cloned coffee and the reality of its implementation on the ground.

In terms of *recent developments* , studies on the adoption of agricultural innovations in Indonesia have focused on structural factors such as extension services, policies, and access to production inputs. For coffee, most research still focuses on technical agronomic aspects and value chain development, while studies that prioritize farmer motivation as a central factor in cloned coffee adoption are relatively limited, particularly within a sustainable economic framework (Kusuma et al., 2021; Utami et al., 2022) . However, data suggests that successful adoption of cloned coffee has the potential to have multidimensional impacts, not only on increasing farmer incomes but also on strengthening farmer institutions, agroecosystem sustainability, and household economic stability.

Based on these conditions, a significant research gap exists : the lack of integrated analysis of farmer motivation, cloned coffee adoption, and sustainable economic development within a comprehensive and contextual analytical framework. Most studies still separate farmer behavior from the impact on economic sustainability, thus failing to comprehensively explain how innovation adoption decisions impact the long-term sustainability of coffee farming (Dewi et al., 2022; Maulana & Fitri, 2021) .

Thus, the novelty of this research lies in its integrative approach, which positions farmer motivation as a key determinant of cloned coffee adoption and analyzes its implications for strengthening the sustainable economy of farming households. This research combines the perspectives of farmer behavior, coffee variety innovation, and economic sustainability within a single, interconnected analytical framework, with the empirical context of the Buton Regency archipelago, which has received relatively little attention in the national literature (Aaron & Amelia, 2023; Sulistyo et al., 2020) .

This research is significant because it has strong theoretical and practical implications. Theoretically, this study enriches the study of agricultural innovation adoption by emphasizing the role of farmers' internal motivation in supporting economic sustainability. Practically, understanding farmer motivation can provide a basis for formulating more adaptive, participatory, and long-term coffee development policies and programs. Thus, the adoption of cloned coffee should be understood not merely as a technical solution, but as a sustainable economic development strategy based on the rationality and real needs of local farmers.

RESEARCH METHODS

This study uses a qualitative approach with a descriptive-exploratory research type . The qualitative approach was chosen because this study aims to deeply understand farmers' motivations in adopting cloned coffee, which is a social and behavioral phenomenon laden with subjective meanings, personal experiences, and local socio-economic contexts. This approach allows researchers to explore farmers' perceptions, beliefs, and considerations in making innovation decisions that cannot be measured quantitatively (Moleong, 2021; Sugiyono, 2021) . In agricultural and rural development studies, a qualitative approach is considered effective in understanding the dynamics of innovation adoption based on farmer behavior, especially in the context of areas with structural limitations such as islands (Arifin et al., 2021; Suyanto & Widodo, 2022) .

This research was conducted in Kaongkeongkea Village, Pasarwajo District, Buton Regency for 10 months. Operationally, the research was carried out in four stages: (1) research preparation and design (November 2025–February 2026); (2) field data collection (February–May 2026); (3) data analysis and validation (March–June 2026); and (4) article preparation and publication (June–August 2026). The publication stage includes article preparation, journal submission, revision, and the publication process.

The research location was chosen intentionally because this region has the potential to develop smallholder coffee, but the adoption rate of innovations, particularly cloned coffee, is still relatively low. Buton Regency also represents an archipelago with limited access to infrastructure, information, counseling, and markets, which influence farmers' behavior and motivation in adopting agricultural innovations (Iskandar & Putri, 2022; Rahman et al., 2020). The socio-economic context of coffee farmers, dominated by small-scale businesses, the use of local seeds, and a subsistence to semi-commercial agricultural orientation, provides an important background in understanding the dynamics of farmer motivation and its implications for strengthening a sustainable economy at the household level.

The subjects of this study were coffee farmers in Kaongkeongkea Village, Pasarwajo District, Buton Regency. Informants were selected using a purposive sampling technique, selecting informants deemed to have relevant knowledge and experience related to coffee farming and innovation adoption. Key informants included coffee farmers who had adopted cloned coffee and those who had not, farmer group administrators, and agricultural extension workers involved in coffee development programs. The use of purposive sampling in qualitative research aims to obtain rich and in-depth information, not to statistically represent the population (Creswell & Poth, 2021; Sugiyono, 2021). The diversity of informants allows researchers to gain diverse perspectives on the motivations, barriers, and opportunities for cloned coffee adoption.

Data collection was carried out through in-depth interviews, Field observations, and Documentation Study. Interviews were conducted semi-structured with flexible guidelines to explore economic motivations, risk perceptions, farming experiences, and farmers' perspectives on the economic sustainability of the coffee business. In-depth interviews were chosen because they allow for a more comprehensive exploration of the meaning and rationale behind farmers' actions (Creswell & Poth, 2021; Moleong, 2021).

Field observations were conducted to observe coffee cultivation practices, seed use, land conditions, and social interactions among farmers within farmer groups. Meanwhile, a documentation study was conducted using regional agricultural data, extension reports, and related policy documents as supporting and comparative data, as recommended in qualitative research on rural agriculture and socioeconomics (Suyanto & Widodo, 2022).

Data analysis was performed in a way Descriptive Qualitative through stages data reduction, data presentation, and data extraction conclusion. Data reduction is carried out with grouping and focusing data from interviews, observations, and documentation in accordance with theme research. Data presented in form narrative and categories thematic depicting motivation farmers, factors drivers and inhibitors adoption of cloned coffee, and its implications to economy sustainable. Analysis process done in a way iterative and sustainable from beginning data collection up to stage end research, so that allows sharpening interpretation and deepening meaning findings (Miles et al., 2020; Sugiyono., 2021)

RESULTS AND DISCUSSION

Results

analysis of data from interviews, focus groups, and field observations identified six factors contributing to clonal coffee adoption: economic motivation, perceived benefits of innovation, social and institutional influences, access to resources, barriers to adoption, and economic sustainability orientation. The interaction of these six factors shapes farmers' decisions and determines the contribution of adoption to productivity, farm efficiency, income stability, and economic resilience, as presented in Figure 1.



Figure 1. Conceptual model cloned coffee adoption For strengthen economy sustainable .
Source : Analysis results researcher , 2026

Figure 1 shows that motivation economics and perception benefit push farmer adopting clonal coffee . The influence social and institutional as well as access source Power strengthen the adoption process , while limited capital, knowledge and facilities production become inhibitor . Interaction sixth factor the determine decision improvement - oriented adoption productivity , stability income , and sustainability economy farmer

Research result show that adoption of clonal coffee by farmers in Kaongkeongkea Village , District Pasarwajo , Buton Regency , is a process of taking complex and multidimensional decisions . These decisions No solely determined by availability material plant superior , but formed through interaction between consideration economy , characteristics innovation , learning process social , support institutional , capability access source power , perception risk , and orientation sustainability business farmer .

1. Farmers' Motivation in Adopting Clonal Coffee

Motivation is the initial foundation that drives farmers to consider and make decisions about adopting clonal coffee. Research findings show that this motivation encompasses three subdimensions: economic, social, and institutional. These three factors do not operate in isolation but rather reinforce each other in shaping farmers' readiness to accept innovation.

Motivation economy become the most fundamental driver in decision adoption . Farmers looking at clonal coffee as opportunity For increase productivity , gain more results

uniform , reduce inefficiency cost production , and creating more income stable . Compared with local coffee plants whose productivity assessed not enough uniform , clonal coffee perceived have potential production more high , endurance plant more good , and quality more results consistent .

Consideration the in line with draft *relative advantage* , namely innovation more easy adopted if offer benefit more big compared to practice previously , such as improvement productivity , efficiency cost , quality , and revenue (Warnaen & Nurlaili, 2026; Lee et al., 2024) . In coffee commodities , varieties superior proven increase production at a time reduce costs and vulnerability to disease (Temesgen & Debeb, 2024) , 2024). At Kaongkeongkea, motivation economy reflected from hope farmer to productivity , efficiency costs , and stability income term long .

Motivation social formed through exemplary behavior farmer pioneer , exchange information and support group farmers who reduce uncertainty adoption (Morrison et al., 2025 ; Manda et al., 2024) . Temporary that , motivation institutional strengthened by assistance seeds , counseling , training and mentoring technical improvements ability farmer as well as pressing risk beginning adoption (Amrullah et al., 2025) . Thus , motivation economic , social , and institutional become base decision as well as sustainability adoption of clonal coffee in Kaongkeongkea Village , as presented in the table following :

Table 1. Economic, Social, and Institutional Motivations

Dimensions Motivation	Category Motivation	Indicator Empirical	Description Field Findings	Implications to Adoption of Cloned Coffee
Economic Motivation	Improvement productivity	Production more fruit uniform and tall .	The farmers say that the coffee is the result cloning produce more harvest stable and quantity more fruit Lots than local coffee .	Speed up decisions adoption Because benefit economy term short and medium .
	Efficiency cost production	Reduce cost maintenance	Cloned coffee considered more stand to disease so that can reduce use pesticides .	Increase efficiency agriculture and interesting innovation .
	Stability income	More predictable income	The farmers feel certainty harvest every season .	Increase sense of security in investment agriculture
Motivation Social	Learning social	Emulating the practices of successful farmers	The farmers pushed For adopt method the after see success other farmers .	Accelerate the spread innovation through network social

	Influence group farmer	Discussion and recommendations together	Group farmer become receptacle For share experience and validate innovation .	Strengthen legitimacy coffee adoption results cloning .
Motivation	Support government	Help seeds and facilities production	Assistance program seed cloning is door beginning For adoption .	Reduce risk adoption technology at the stage beginning .
Institutional	Help technical	Counseling and guidance field	Officer extension worker agriculture play a role in knowledge transfer about cloned coffee cultivation .	Increase capacity technical farmer

Source : Analysis results researcher , 2026

Table 1 shows that motivation farmer in adopt cloned coffee influenced by dimensions economic , social , and institutional interdependence related . Motivation economy , which includes improvement productivity , efficiency cost production and stability income , encourage farmer For see cloned coffee as profitable innovation in a way financial and accelerate decision adoption , in line with findings (Putri & Lestari, 2021; Sutrisno et al., 2021) which emphasizes orientation economy as driver main adoption innovation agriculture . Motivation social appear through learning from practice successful and influential farmers group farmers , which strengthens legitimacy innovation and acceleration diffusion through network social , appropriate with theory diffusion innovation (Rogers, 2020; Sari et al., 2021) . Motivation institutional , in form support government and aid technical , role in reduce risk early and improve capacity technical farmers , as explained by (Lestari et al., 2023; Prasetyo et al., 2022) about importance role institutional in success adoption innovation agriculture . Dimensions this whole shows that cloned coffee adoption No only triggered by factors economy individual , but also reinforced by interaction social and support institutions , which together form base sustainability adoption and strengthening economy coffee farmers in Kaongkeongkea Village Subdistrict Pasarwajo Buton Regency .

2. Perception Farmer about Cloned Coffee Innovation

Perception farmer against cloned coffee play role important in determine level acceptance and decision adoption this innovation . The findings studies show that farmer assessing cloned coffee own benefit relatively clear , such as improvement quality and quantity harvest , and suitability with condition agroclimate and practices cultivation local . This perception builds belief that innovation the worthy For implemented , at the same time reduce risk resistance to change . In addition , perception about risk related beginnings with costs and uncertainty results also affect method farmer adopt in a way gradual , showing that adoption innovation is an evaluative process that takes into account benefits and risks in a way simultaneously .

Table 2. Perception Farmer about Cloned Coffee Innovation

Dimensions Perception	Rated aspect	Indicator Perception	Description Perception Farmer	Impact on Adoption Decisions
Perception about Benefits	Productivity	Improvement results harvest	The farmers have an opinion that the coffee is the result cloning produce more fruit many and uniform compared to local coffee .	Push attitude positive to adoption .
	Quality results	Quality seed the coffee more Good .	Coffee results cloning considered own size more seeds uniform and quality sell more tall .	Increase Power market pull and value economy .
Perception Convenience	Cultivation techniques	Easy studied	The farmers feel that technique cloned coffee cultivation relatively easy implemented after get guidance .	Speed up adoption beginning
	Maintenance plant	Maintenance more simple	Clone coffee considered more stand to pests and diseases .	Lower obstacle technical For adoption
Risk Perception	Risk of failure	Concerns will failure harvest	Some farmers Still worry will failure at stage planting beginning .	Hinder adoption full , pushing adoption gradually .
	Economic risks	Cost relatively early tall	Investment early in the seedlings and their care is consideration main .	Need support institutional
Perception Conformity	Compliance land	Adaptive to condition local	The farmers assess coffee results cloning based on condition soil and climate local .	Strengthen trust adoption term long
	Compliance to habit	Not contrary to local practices.	Cultivation of cloned coffee considered Still in line with practice traditional .	Reduce resistance culture
Perception about Sustainability	Impact environment	More friendly environment	Pesticide use is reduced due to plant resistance.	Support practice agriculture sustainable

Dimensions Perception	Rated aspect	Indicator Perception	Description Perception Farmer	Impact on Adoption Decisions
Perception Social	Resilience agriculture	Stability production term long	Cloned coffee viewed capable guard sustainability agriculture .	Strengthen commitment adoption
	Reception social	Accepted by the community	Coffee innovation results cloning accepted in a way widespread among group farmer .	Accelerate the spread innovation
	The influence of farmers pioneer	Example real success	Farmer pioneer become role model for farmer other .	Increase belief in innovation

Source : Analysis results researcher , 2026

Table 2 shows that perception farmer own role central in determine decision For adopting cloned coffee . In terms of benefits , farmers consider that cloned coffee capable increase productivity and quality coffee beans , so that push attitude positive to adoption and strengthening Power pull economy (Hidayat et al., 2021; Kurniawan & Sari, 2022) . Perception convenience , including technique relative cultivation easy studied and cared for more plants simple , lower obstacle technical and expedited adoption early . However , the perception risk , good risk failure and cost investment relatively early high , pushing a number of farmer For adopt in a way gradual and requires support institutional . Perception suitability with condition land and practice local as well as perception sustainability economy and environment strengthen trust farmer For maintain innovation in term long . In addition , the perception social through reception society and roles farmer pioneer increase legitimacy innovation and acceleration distribution adoption . In Overall , these findings confirm that perception farmer to cloned coffee innovation is multidimensional, including benefits , convenience , risks , suitability , sustainability , and other aspects social , which is collective influence speed , scale , and sustainability adoption innovation at the level field (Rogers, 2020; Sari et al., 2021) .

3. Social and Institutional Factors in Adoption of Cloned Coffee

Social and institutional factors play role important in strengthen adoption of cloned coffee among farmers . Interaction social , such as Study from practice successful and influential farmers group farmers , speed up distribution innovation through network social and constructive legitimacy For practice cultivation new . Meanwhile that , support institutions , including provision seeds , facilities production , and assistance technical by the government and officers counseling agriculture , helping reduce risk early and improve capacity technical farmers . Synergy between mechanism This social and institutional situation shows that success adoption innovation No only depending on the benefits technical aspects of cloning coffee , but also on the structure social and support institutions that facilitate the adoption process .

Table 3. Social and Institutional Factors in the Adoption of Cloned Coffee

Factor Dimensions	Main Components	Indicator Empirical	Description Field Findings	Role in Adoption of Cloned Coffee
Social Factors	Group roles farmer	Intensity meetings and discussions	Group farmer is receptacle main For share experience and learning collective .	Accelerate the spread innovation
	Social capital	Trust and solidarity	High level of trust between farmer strengthen adoption based on experience together .	Reduce obstacle to innovation
	Farmer pioneer	Examples success real	Farmers who adopt more beginning become role model for farmer other .	Increase legitimacy innovation
	Social norms	Informal agreement	Use of coffee results cloning the more accepted as practice general .	Strengthen adoption sustainable
Factors Institutional	Support government	Help seeds and facilities production	Assistance program is trigger beginning coffee adoption results cloning .	Lower obstacle beginning For adoption
	Role of officers extension worker agriculture	Help technical sustainable	Officer extension worker help in knowledge transfer and problem solving problem technical .	Increase capacity technical farmer
	Policy regional	Coffee development program	Regional policies support the development of coffee commodities.	Ensure program sustainability
	Access to institution supporters	Cooperatives and institutions financing	Access to financing Still limited but start develop .	Influence scale and speed adoption
Social Interaction Institutional	Synergy actor	Collaboration farmer-government	Collaboration increase program trust and effectiveness .	Strengthen adoption sustainable
	Participation farmer	Involvement in the program	Farmers are actively involved in planning and implementation.	Increase sense of ownership to innovation

Source : Analysis results researcher , 2026

Table 3 shows that factor social and institutional in a way together play role key in strengthen adoption of cloned coffee among farmers . From the side social , role group farmer as room discussion and learning collective , social capital in the form of trust between farmers , farmers pioneer as example success , and accepted norms in a way social , has proven speed up diffusion innovation and reducing resistance to change practice (Sari et al., 2021; Wahyuni et al., 2020). Temporary that , factor institutions , including support government , aid technical by extension workers agriculture , policy area , and access to institution supporters , giving legitimacy , reducing obstacle early , and improve capacity technical and financial farmer For adopt innovation . Interaction between aspect social and institutional , such as collaboration farmer-government and participation active farmer in the program, strengthening sustainability adoption , building a sense of ownership to innovation , and ensure sustainability benefit economy . This finding confirms that success adoption innovation agriculture No only depend on one dimensions , but in synergy factor social and institutional support the entire adoption process (Lestari et al., 2023; Utami et al., 2022) .

4. Farmer Access to Resources in Adoption of Cloned Coffee

Farmer access to various source Power is factor important in determine success adoption of cloned coffee . Source the power in question covering land , capital, facilities production , information technical , and experts who accompany . Farmers who have access more easy to source this power tends to capable adopt innovation with more fast and effective , while limited access can slow down or limit scale adoption . This finding is in line with with approach *eye livelihood sustainable* , which emphasizes that ability farmer For access and utilize asset production and knowledge technical play a role direct in success implementation innovation agriculture . Thus , strengthening access to source Power is an important strategy For push cloned coffee adoption in a way sustainable .

Table 4. Farmer Access to Resources in Adoption of Cloned Coffee

Resource Types	Access Form	Access Indicator	Description Field Findings	Influence to Adoption of Cloned Coffee
Natural resources	Land access	Land area and its suitability	Most of the farmer own land Alone with level suitability currently until tall .	Determining the scale of clone coffee adoption
	Quality land	Fertility land and water availability	Clone coffee considered adaptive to condition land local .	Support sustainability production
Physical Resources	Clone coffee seeds	Availability and quality seeds	Access to seed generally through assistance programs government .	Speed up adoption beginning
	Production tools	Agricultural tools and inputs	Equipment availability is still limited but sufficient for small scale.	Limit expansion adoption

Resource Types	Access Form	Access Indicator	Description Field Findings	Influence to Adoption of Cloned Coffee
Financial Resources	Venture capital	Own capital and loans	Farmer dependent on private capital ; Access to credit Still limited .	Cause adoption done in a way gradually .
	Access to financing	Cooperatives and institutions finance	Only part connected farmers with institution financing .	Influence intensity adoption
Source Power man	Knowledge technical	Understanding about clone coffee cultivation	Knowledge increases through guidance and experience.	Increase success adoption
	Skills farmer	Skills practice field	Skills develop in a way gradually .	Support adoption sustainability
Source Information	Information technology	Counseling and informal media	Information obtained from officer extension worker agriculture and fellow human beings farmer .	Reduce uncertainty adoption
	Market access	Information pricing and marketing	Market information is still limited and not evenly .	Influence motivation term long
Social Resources	Network social	Connection in group farmer	Social networks are a major source of support and information.	Accelerate the spread innovation

Source : Analysis results researcher , 2026

Table 4 shows that access farmer to various source Power is factor determinant success adoption of cloned coffee . Access to source Power nature , such as wide land and quality , determine scale and sustainability production , whereas access to source Power physical , including seeds and tools production , speed up adoption early , though limitations tool can limit expansion adoption (Fitriani et al., 2023; Nurhadi et al., 2022) . Source Power finance , in the form of personal capital and access credit , influence intensity and speed adoption , whereas source Power humans , including knowledge and skills technical farmers , improve success implementation practice cloned coffee cultivation . In addition , access to source Power information and networking social allows farmer For get knowledge technical , market information , and support collective that accelerates diffusion innovation . This finding confirms that strengthening access to source Power integrated physical , financial , human , informational , and social is an important strategy For push sustainable adoption of cloned coffee at the farm level farmer (Kurniawan et al., 2023; Putri & Lestari, 2021) .

5. Obstacle in Farmers Adoption of Cloned Coffee

The implementation of cloned coffee by farmers in Buton Regency is facing various constraint technical , economic , and social . Technical constraints covering dependence on skills cultivation new and risky fail harvest , while obstacle economy related with limited capital, costs early , and access to tool production . From the side social , rejection to change practice traditional and limited market information also influences decision implementation . These constraints indicate that the implementation process innovation No always linear, but rather happen in a way gradually with adjustment to condition local and capacity farmer .

Table 5. Obstacles for Farmer in Adopting Cloned Coffee

Category Obstacle	Types Obstacle	Indicator Empirical	Description Field Findings	Impact on the Adoption Process
Economic Barriers	Capital limitations	Cost relatively early tall	Cost procurement seeds and care beginning considered as burden .	Postpone adoption full
	Financial risks	Uncertainty results	The farmers worry will fail harvest at the stage beginning .	Push adoption partial
Technical Barriers	Knowledge limited	Lack of experience beginning	Farmer need time For understand technique cloned coffee cultivation .	Slowing adoption
	Availability facility	Limitations tools and input	Means of production Not yet fully available .	Limit intensity adoption
Obstacle Social	Resistance culture	Preference towards local coffee	Some farmers Still maintain varieties local .	Hinder reception innovation
	Influence environment social	Skepticism public	The negative experiences of some farmers influence collective perceptions.	Slow down distribution innovation
Obstacle Institutional	Help limited	Intensity low counseling	Assistance provided No evenly and unevenly sustainable .	Lower adoption success rates
	Policy access	Programs that do not sustainable	Uncertainty about sustainability help	Decline trust farmer
Obstacle Information	Access to market information	Determination pricing and marketing Still Not yet Certain .	Information regarding the cloned coffee market is still limited.	Lower motivation term long

	Literacy technology	The low understanding about innovation	Information technical Not yet delivered optimally .	Add uncertainty adoption
Obstacle Environment	Condition agroclimatic	Variability weather	Change weather influence productivity .	Improvement risk adoption

Source : Analysis results researcher , 2026

Table 5 shows that adoption of cloned coffee by farmers in Buton Regency is facing obstacle multidimensional , including aspect economic , technical , social , institutional , informational , and environmental . Barriers economy , such as capital and risk limitations finance , encourage adoption in a way gradually , temporarily obstacle technical related with limitations knowledge and availability facility production slow down ability farmer For apply practice cultivation new (Nasution et al., 2022; Rahmawati & Nugroho, 2022) . Obstacles social , in the form of resistance culture and influence skepticism society , influencing perception collective and slow down diffusion innovation , while obstacle institutions , including limitations assistance and access policies that do not sustainable , reducing trust farmer to the program . In addition , the limitations access to market information and literacy technology increase uncertainty adoption , while variability condition agroclimate add risk technically . In terms of Overall , these findings confirm that success cloned coffee adoption depends on mitigation strategies integrated barriers , both through support financial , improvement capacity technical , intervention institutional and access adequate information (Putri & Lestari, 2021; Utami et al., 2022) .

6. Economic Sustainability Orientation in the Adoption of Cloned Coffee

Economic sustainability is a key factor driving farmers to maintain and develop sustainable cloned coffee cultivation practices. Farmers perceive that adopting cloned coffee not only provides short-term economic benefits through increased productivity and cost efficiency, but also adds income stability and long-term added value to the farm. Awareness of these sustainable economic benefits influences farmers' decisions to integrate innovations into their routine practices while minimizing investment risks.

Table 6. Farmers' Economic Sustainability Orientation in Adopting Cloned Coffee

Dimensions Orientation	Aspect Sustainability	Indicator Empirical	Description Field Findings	Implications to Economic Sustainability
Stability Income	Consistency results	Relative production stable	The farmers have an opinion that the coffee is the result cloning capable give more results consistent compared to local coffee .	Increase certainty income
	Fluctuation price	Bargaining power product	Quality of coffee results cloning	Reduce vulnerability

Dimensions Orientation	Aspect Sustainability	Indicator Empirical	Description Field Findings	Implications to Economic Sustainability
Efficiency Agriculture	Productivity	Yield per hectare	increase Power bargain in local markets . Higher productivity of cloned coffee	economy Increase efficiency cost
	Cost production	Input-output ratio	Cost beginning of course high , but will decrease in term long	Increase eligibility business the
Value- added Product	Quality and grade	Standard market quality	Cloned coffee own better quality uniforms and grades high selling .	Push improvement mark plus
	Potential processing	Diversification product	Opportunity processing post harvest start develop	Expand flow income
Sustainability Long- term	Resilience	Continuity production	Clone coffee considered capable support agriculture term long .	Strengthen resilience economy farmer
	Regeneration farmer	Generation interest young	Cloned coffee interesting interest farmer young .	Ensure sustainability this sector
Market Access	Marketing network	Connection with buyer	The market network is still limited but has potential.	Determine scale sustainability
	Market information	Access to determination price and demand	Market information is not evenly	Need strengthening institutional
Orientation Investment	Planning business	Prospects term long	The farmers start see the coffee results cloning as investment .	Divert pattern life subsisten to orientation commercial .

Source : Analysis results researcher , 2026

Table 6 shows that orientation sustainability economy is factor important thing that drives farmer For adopt cloned coffee in a way consistent and strategic . Stability income through results more harvest consistency and power bid more products tall increase certainty economy and reduce vulnerability to market fluctuations (Ramadhan & Suryani, 2023; Utami et al., 2022) . Efficiency agriculture , which is reflected in greater productivity height and

ratio cost increasing production profitable , encouraging continuity business term long . Added value product through quality uniform seeds and potential processing post harvest expand source income , while sustainability term length , including resilience business and regeneration farmer young , make sure sustainability coffee sector in the local area . Market access and orientation investment show that farmer start divert focus they from activity subsisten to activity commercial with planning business term long , which confirms that cloned coffee adoption No only nature technical , but also strategic in build sustainable economy (Hidayat et al., 2021; Putri & Lestari, 2021) .

Discussion

Research result disclose that The adoption of clonal coffee by farmers in Buton Regency is influenced by six factors. dimensions main , namely motivation farmers , perception innovation , factors social and institutional , access to source power , resistance adoption , as well as orientation sustainability economy . First , motivation farmer covers aspect economic , social , and institutional . Motivation economy in the form of improvement productivity , efficiency costs , and stability income push adoption Because give superiority real compared to practice previously (Lee et al., 2024; Temesgen & Debeb, 2024) . Learning from farmer pioneers and interactions group farmer speed up distribution information as well as strengthen trust to innovation (Morrison et al., 2025; Manda et al., 2024) . Temporary that , help seeds , counseling and mentoring technical reduce risk beginning as well as increase capacity farmer in apply innovation (Amrullah et al., 2025) .

Second , perception farmer against clonal coffee covers benefits , convenience , risks , suitability , sustainability , and acceptance social . Farmers assessing clonal coffee more productive , producing uniform , resistant seeds to disease , and easy cultivated after get mentoring . Perception benefits and suitability innovation strengthen decision adoption , whereas risk failure push farmer apply it in a way gradually (Warnaen & Nurlaili, 2026 ; Lee et al., 2024). Success farmer pioneers also become proof empirical evidence that strengthens legitimacy social and accelerate clonal coffee diffusion (Morrison et al., 2025) et al., 2025; Manda et al., 2024) .

Third , the factor social and institutional proven each other complement . Interaction social in group farmers , social capital , social norms , and existence farmer pioneer push diffusion innovation , while support institutional from government , extension workers agriculture , policy area , and access to institution supporters lower obstacle early and improve capacity technical and financial farmers . Synergy between factor social and institutional strengthen sustainability adoption and building a sense of ownership innovation at the level public (Lestari et al., 2023; Wahyuni et al., 2020) .

Fourth , access to source Power is factor determinant important in adoption of cloned coffee . Farmers with more access Good to land , seeds , facilities production , capital, market information , and knowledge technical capable adopt innovation more faster and more effective . Network social as source information and support also accelerates diffusion and reduce uncertainty , support perspective *eye livelihood sustainable* which emphasizes relatedness between asset production , knowledge , and success innovation agriculture (Fitriani et al., 2023; Nurhadi et al., 2022) .

Fifth , obstacles adoption is multidimensional, including obstacle economy (limited capital , risk financial), technical (knowledge and means) limited), social (resistance culture

, skepticism community), institutions (mentoring limited , program uncertainty), information (market access and literacy) technology), and environment (variability agroclimatic). These obstacles encourage adoption gradual , emphasizing the need for mitigation strategies integrated so that the adoption process walk effective and sustainable (Putri & Lestari, 2021; Rahmawati & Nugroho, 2022; Sulastris et al., 2022) .

Sixth , orientation sustainability economy emphasize that farmer looking at cloned coffee as investment term length . Stability income , efficiency agriculture , value plus product , durability business , regeneration farmer young , and market access encourages strengthening sustainable economy . This orientation emphasizes that cloned coffee adoption No only effort technical , but an economic strategy that expands opportunity income and ensure sustainability agriculture , in line with literature latest about orientation agriculture sustainable (Ramadhan & Suryani, 2023; Utami et al., 2022) .

In a way overall , findings This research confirms that adoption of cloned coffee by farmers is a multidimensional process that is influenced by internal motivation , perception innovation , interaction social , support institutional , access source power , mitigation obstacles , and orientation economy sustainable . Synergy between these factors form base For strengthen economy sustainable in Buton Regency and provide implications important for development of cloned coffee at the level local and regional.

CONCLUSION AND SUGGESTIONS

Conclusion

Based on results research and discussion , can concluded that adoption of cloned coffee by farmers is a complex and multidimensional process , which is influenced by a combination of factors . factor economic , technical , social , institutional , informational , and environmental . Motivation economy is driver main , especially related with improvement productivity , stability income and efficiency agriculture . However , the success adoption No only determined by benefits economy only , but also by perception farmer to characteristics innovation , support social in the community agriculture , and the role institutional through mentoring , policies , and access to source Power production . Obstacles adoption , such as limited capital, risk finance , resistance culture , and uncertainty market information , has cause part farmer choosing an adoption strategy gradually or partial . On the other hand , orientation sustainability economy show that cloned coffee viewed as innovation that has prospects term long in strengthen resilience economy farmers . Cloned coffee considered capable give more income stable , improving efficiency and value plus products , as well as open opportunity regeneration farmer through interest generation young to more modern and valuable agriculture economy . Therefore that , strengthening cloned coffee adoption need approach integrated that is not only focus on aspects technical cultivation , but also on strengthening institutions , market access , provision adequate information , and social capital development farmers . This approach is important For ensure that cloned coffee adoption can ongoing in a way sustainable and provide contribution significant to improvement welfare farmer .

Suggestion

Based on findings this study , it is recommended that the development and adoption of clonal coffee supported through a more approach integrated with strengthen role government area , service counseling agriculture , and institutions farmers , in particular group farmers and cooperatives , to ensure sustainability help technical , availability seeds quality height , and increase capacity farmers . Expanding access farmer to scheme financing adaptive , transparent market information , and networks more marketing area is also important For overcome constraint economy and strengthen orientation investment term long . More further , clonal coffee development strategy must directed No only on improvement productivity , but also on creation mark add , increase Power competition products , and encourage regeneration farmers , so that clonal coffee can functioning as innovation agriculture sustainable from perspective economic , social , and institutional .

THANK-YOU NOTE

The author would like to express his gratitude to Muhammadiyah Research (RisetMU) on regular fundamental research II for their financial support for this research. We also extend our appreciation to Muhammadiyah University of Buton, the Kaongkeongkea Village Government, agricultural extension workers, farmer group administrators, and all coffee farmers who have provided support and participated in the research .

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