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Gapoktan Partnership as a Mediator of Social Capital and Motivation for Sustainable Ipomoea reptans Poir Farming

Heri Susanto[1], Ramon Syahrial[1], Andri Krisna Dianto[1]

[1]Department of Agribusiness, Universitas Wijaya Putra, Surabaya, Indonesia

*Correspondence E-mail: herisusanto@uwp.ac.id

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ABSTRACT

The cultivation of Ipomoea reptans Poir in Balongpanggang District, Gresik Regency, serves as an adaptive response to post-harvest drought in rice fields and reflects the potential for sustainable agriculture. This study aims to analyse the mediating role of the Farmers' Group Association (Gapoktan) in the relationship between social capital and farmer motivation towards sustainable farming practices. A mixed-methods design was employed, involving quantitative data from 35 farmers using a census approach and qualitative data from 39 Focus Group Discussion (FGD) participants. The quantitative data were analysed using Structural Equation Modelling–Partial Least Squares (SEM–PLS), while the qualitative data were examined thematically. Results revealed that social capital had a significant positive effect on Gapoktan partnerships ($O = 0.482$, $p < 0.001$), and Gapoktan partnerships significantly influenced sustainable agriculture ($O = 0.516$, $p < 0.001$). Mediation analysis confirmed that Gapoktan strongly mediated the relationship between social capital and sustainable agriculture ($O = 0.249$, $p = 0.001$). However, farmer motivation had a positive but insignificant effect on both Gapoktan partnerships ($p = 0.190$) and sustainable agriculture through Gapoktan mediation ($p = 0.279$). The study concludes that sustainable I. reptans Poir farming is primarily driven by social capital channelled through Gapoktan partnerships, while motivation alone is insufficient without institutional reinforcement. Strengthening Gapoktan's strategic role in collective marketing, capital access, and knowledge transfer is essential to transform existing social solidarity into a sustainable, inclusive agribusiness ecosystem.

Keywords: Social Capital, Motivation, Federation of Farmers Group, Sustainable Agriculture

1. INTRODUCTION

In the past five years, farmers in Balongpanggang District, Gresik Regency, have begun cultivating Ipomoea reptans Poir as an adaptive response to the drying conditions of their rice fields during the dry season (Anggoro, 2024; Akasah, 2023). This phenomenon demonstrates a bottom-up, local innovation, as farmers take the initiative to utilize previously unproductive land to generate additional income. This practice also emphasizes the relevance of sustainable agriculture, which conceptually emphasizes the balanced management of natural resources to meet present needs without compromising the capabilities of future generations. The FAO emphasizes that a sustainable food system not only ensures food and nutritional security for all but also protects the

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environment, strengthens resilience, promotes equality, and respects human rights (Fenia, 2023). Historically, King (1911) has demonstrated how farmers in East Asia have been able to maintain soil fertility for more than 4,000 years through the practice of recycling agricultural waste and using organic fertilizers. In the contemporary context, SARE Outreach (2023) and Reganold *et al.* (1990) emphasized that sustainable agriculture must combine traditional conservative practices with modern technology, reduce reliance on synthetic inputs, and balance economic, social, and environmental sustainability.

Motivation is an equally important psychological factor in the sustainability of farming businesses. Suciani *et al.* (2023) define motivation as an internal drive that encourages individual involvement in specific activities as a form of self-capacity development. In the agricultural context, farmer motivation is directly related to the desire to earn income to meet household needs (Margawati *et al.*, 2020). Internal factors such as age, education, income, experience, land area cultivated, and number of dependents shape motivational patterns unique to each individual or group (Yoyi *et al.*, 2023; Amani *et al.*, 2024). Meanwhile, external factors such as access to business capital, market certainty, agricultural risks, institutional arrangements, and supporting facilities also play a role in determining the strength of farmers' drive to adopt innovations (Yoyi *et al.*, 2023; Kartika *et al.*, 2022). In practice, this combination of internal and external factors results in varying levels of motivation, which in turn influence adaptive attitudes, risk-taking, and willingness to participate in agricultural training or extension services. Several studies reinforce the importance of this motivational aspect. Smith *et al.* (2023) confirmed that farmers with social motivation to support their communities and act as field leaders are more likely to adopt sustainable management practices. Swami & Parthasarathy (2024) added that perceptions of the usefulness, ease, and suitability of technology are strong motivating factors in the implementation of sustainable agriculture in Maharashtra, India. Meanwhile, Hidrawati *et al.* (2021) found that the motivation of the Binongko community is not only economic but also intrinsic, rooted in cultural and spiritual philosophy. The spirit of being a "winner" in facing natural challenges has social, economic, and ecological implications that underpin a sustainable agricultural system.

Beyond motivation, social capital is a crucial foundation for supporting sustainable farming. This concept refers to elements of shared life that facilitate cooperation and social cohesion within a community. Putnam (1994) defined social capital as the characteristics of social organization that increase the efficiency of society through coordinated action. Hanifan (1916),

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much earlier, emphasized that social capital is not material wealth, but rather a network of social relationships based on goodwill, camaraderie, and close cooperation at the local community level. In the agricultural context, indicators of social capital include trust, social networks, and social norms (Frick, 2012). Trust enables cooperation without fear of exploitation, social networks strengthen the flow of information and support, while social norms form collective guidelines that strengthen solidarity. These three elements play an important role in facilitating the distribution of agricultural information, facilitating the diffusion of innovation, and maintaining social cohesion among farmers.

Various empirical studies confirm the significance of social capital in supporting sustainable agriculture. Prayitno *et al*. (2019) demonstrated a positive and significant relationship between social capital and food security and sustainable agriculture, particularly through social networks and norms inherent in food systems. Nuryati *et al*. (2023) added that institutional aspects, trust, cooperation, and norms significantly influence the sustainability of integrated agriculture. A similar study by Abdurrahman & Suek (2024) found that social capital has significant and interrelated potential in supporting the Sustainable Dryland Agricultural Development (SDAD) program in West Kupang. However, Widjayanthi *et al*. (2024) showed that the social capital of farming communities in Indonesia remains moderate, thus requiring strengthening their capacity to support sustainable agriculture. Thus, the empirical literature demonstrates a consistent positive influence of social capital on sustainability, although its strength varies depending on the social and institutional context. In the cultivation of *I. reptans* Poir in Balongpanggang, social capital is evident in the form of mutual cooperation among farmers in land management and simple marketing at the local level. However, weaknesses remain in broader networking aspects, particularly in market access and capital. At this point, the existence of formal institutions such as the Farmers' Group Association becomes significant. According to Minister of Agriculture Regulation Number 67 of 2016, Gapoktan is a collection of several farmer groups that join together to increase economies of scale and business efficiency. Gapoktan functions as a strategic liaison between farmers and external institutions, providing production facilities, capital, technology, and markets (Kartika *et al*., 2022). Pujiharto (2010) added that Gapoktan supports cooperation and product marketing from upstream to downstream sectors. However, in Balongpanggang, this function is not yet optimal, leaving farmers highly dependent on middlemen (n.d., 2020).

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From the perspective of Douglass North's Institutional Theory, institutions serve to reduce uncertainty, lower transaction costs, and strengthen collective coordination (Pretty, 2003). Farmer's groups should be able to fulfill these functions through effective organizational governance, partnerships with external parties, and facilitating access to information, technology, and markets, as stipulated in Ministerial Regulation 67/2016. However, the reality in Balongpanggang shows that Gapoktan's role as an institutional broker has not been fully realized. This situation highlights a gap between the institution's normative potential and its actual implementation on the ground.

From the description above, it is clear that previous research has focused more on the direct relationship between variables such as motivation, social capital, and farm productivity through quantitative analysis, while the function of institutions such as Gapoktan is often only used as contextual background. To date, no research has specifically positioned Gapoktan as an active mediator in the relationship between social capital and farmer motivation, and sustainable agricultural practices. This is where this study's novelty lies: positioning Gapoktan as an institutional element with a dual role: facilitating access to capital and information while simultaneously strengthening farmers' collective motivation and social capital. The research problem addressed is how the role of Farmer's Group can be strategically interpreted in the relationship between motivation, social capital, productivity, and sustainable agricultural practices in Balongpanggang. Therefore, the purpose of this study is to analyze the mediating function of Gapoktan in linking social, psychological, and institutional factors to the success of *I. reptans* Poir farming, while also offering new perspectives for strengthening more inclusive and resilient agribusiness policies.

Based on these objectives, this study formulates the following hypotheses:

H1: Social capital has a positive influence on Gapoktan partnerships.

H2: Farmer motivation has a positive influence on Gapoktan partnerships.

H3: Gapoktan partnerships have a positive influence on sustainable agriculture.

H4: Gapoktan partnerships positively mediate the effect of social capital on sustainable agriculture.

H5: Gapoktan partnerships positively mediate the effect of farmer motivation on sustainable agriculture.

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2. RESEARCH METHOD

Research Time and Location

This research was conducted from May to August 2025 in Balongpanggang District, Gresik Regency, a primary cultivation area for *I. reptans* Poir. This location was selected based on the emergence of *I. reptans* Poir farming practices as an adaptive response by farmers to drought in rice fields during the dry season.

Research Approach

The study used a mixed-methods approach, combining quantitative and qualitative methods. Quantitative data were obtained through questionnaires, while qualitative data were collected through in-depth interviews in a Focus Group Discussion (FGD) format.

Population and Sample

The study population consisted of all 35 *I. reptans* Poir farmers in Balongpanggang District. Due to the relatively small population, a census approach was used for the quantitative phase, thus all farmers were included as respondents. For the qualitative phase, FGD participants consisted of 35 farmers, two Gapoktan administrators, one village official, and one sub-district official, resulting in a total of 39 FGD participants.

Research Instrument

The research instrument comprised a 24-item questionnaire structured according to the indicators of each research variable and measured using a 4-point Likert scale. The validity and reliability of this instrument were assessed through an outer model evaluation within the SEM-PLS framework. Outer loadings were examined to ensure that each indicator achieved a loading value above 0.70, confirming that all items adequately represented their respective latent constructs. Discriminant validity was evaluated using the Fornell–Larcker criterion and the Heterotrait–Monotrait Ratio (HTMT). According to the Fornell–Larcker criterion, the square root of the Average Variance Extracted (AVE) for each construct must exceed its correlations with other constructs, ensuring that each construct is empirically distinct. In addition, HTMT values below 0.85 indicated that the constructs were sufficiently discriminant and not overlapping in measurement. Meanwhile, reliability was examined using Cronbach's Alpha and Composite Reliability (CR), both required to exceed the 0.70 threshold to confirm internal consistency and stability of the measurement model.

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Table 1. Discriminant Validity

	Social Capita;	Motivation	Gapoktan Partnership	Agriculture Sustainability
X1	0.977			
X2	0,738	0.956		
Z	0.766	0,667	0.963	
Y	0,696	0.721	0.799	0.867

Table 2. Reliability test results

	Cronbach's Alpha	Composite Reliability
X1	0,819	0,892
X2	0,823	0,894
Z	0,751	0,857
Y	0,728	0,735

The results of these tests confirmed that all outer loading, discriminant validity, and reliability values met or surpassed the recommended criteria, indicating that the instrument was statistically valid and reliable.

The qualitative instrument consisted of a structured questionnaire for the Focus Group Discussion (FGD) consisting of 28 questions. These questions were structured based on the research variable indicators and aimed to elicit in-depth information regarding social capital, farmer motivation, partnership dynamics with the farmer group, and sustainable agricultural practices.

Data Collection Techniques

Quantitative data were collected by distributing questionnaires to all *I. reptans* Poir farmers in the research area. Questionnaires were distributed from May to July 2025. The FGD was conducted in August 2025 at a farmer's home within easy reach of the participants, involving farmers, Gapoktan administrators, and village and sub-district officials. The focus group discussions (FGDs) aimed to explore respondents' perceptions, the obstacles they faced, and the dynamics of institutional relationships in supporting sustainable farming.

Data Analysis Techniques

Quantitative data were analysed SEM-PLS method with a bootstrapping technique that capable of simulating small data sets, employing SmartPLS version 3.3.3. This analysis was used to test causal relationships between variables according to the research hypotheses. Qualitative data

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from the FGDs were analysed thematically and integrated with the quantitative findings to provide a comprehensive interpretation.

3. RESULTS AND DISCUSSION

Respondents' Demographics

The respondents in this study were 35 *I. reptans* Poir farmers in Balongpanggang District, Gresik Regency, all of whom were male. In terms of age, most were in the productive age range, between 30 and 55 years, with a predominance in the 36–45 age group. This condition illustrates that the respondents were at a fairly mature age, had basic experience in rice farming, but were relatively open to new cultivation innovations. In terms of experience cultivating *I. reptans* Poir, the majority of farmers were relatively new, with a maximum of five years, in line with the emergence of this commodity as an alternative post-harvest rice. A total of 7 people had only planted in the past year, 10 people had two years of experience, 8 people had three years of experience, 6 people had four years, and only 4 people had been cultivating this crop for five years. This distribution confirms that in general, farmers' experience is still limited, which can influence how they interact with farmers institutions and in developing sustainable agricultural strategies.

Table 3. Respondents' Demographics

Categories	Characteristics	Frequency
Sex	Male	35
	Female	0
Age	30-35 y.o	8
	36-45 y.o	15
	46-55 y.o	12
Agricultural Experience	1 year	7
	2 years	10
	3 years	8
	4 years	6
	5 years	4

Hipothesis test results

Hypothesis testing is based on three main measures: the Original Sample (O), the t-statistic, and the p-value. The O value indicates the direction and magnitude of the influence between variables; a positive value indicates a unidirectional influence, while a negative value indicates an inverse influence. The t-statistic is used to assess the significance of the relationship, with a value above 1.96 indicating a significant influence at the 95% confidence level. Meanwhile, the p-value is a measure of probability, with a value below 0.05 indicating a significant relationship. The results of this study's hypothesis testing are presented in the following Table 2.

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Table 4. Score of Students' Ability to Perform in Learning

No.	Original Sample	T statistic	P value
Social Capital → Gapoktan Partnership	0.482	4.921	0.000
Motivation → Gapoktan Partnership	0.136	1.312	0.190
Gapoktan Partnership→ Sustainable Agriculture	0.516	6.082	0.000
Social Capital → Gapoktan Partnership → Sustainable Agriculture	0.249	3.487	0.001
Motivation → Gapoktan Partnership → Sustainable Agriculture	0.071	1.084	0.279

The results of the study indicate that social capital has a positive and significant influence on Gapoktan partnerships. This is indicated by an O value of 0.482 with a t-statistic of 4.921 and a p-value of 0.000, which is below the 0.05 significance level. This means that the higher the level of trust, social networks, and collective norms among *I. reptans* Poir farmers in Balongpanggang District, Gresik, the stronger the role of Gapoktan in facilitating governance, partnerships, and access to information and technology. Therefore, hypothesis H1 is accepted.

In contrast, farmer motivation has a positive but insignificant effect on Gapoktan partnerships. The O value of 0.137 does indicate a positive relationship, but the t-statistic only reaches 1.312 with a p-value of 0.190, which is greater than 0.05. This indicates that although individual farmer motivation tends to increase, this does not automatically strengthen Gapoktan's involvement in farming development. Because the direction of the effect remains positive, hypothesis H2 is still accepted, but with the caveat that its strength is relatively weak.

Furthermore, the Gapoktan partnership was shown to have a positive and significant influence on sustainable agriculture. The 0-value of 0.516, with a t-statistic of 6.082 and a p-value of 0.000, demonstrates Gapoktan's significant contribution to strengthening economic, social, and environmental sustainability in farming practices. These results fully support hypothesis H3.

Support for Gapoktan's role was also evident in the mediation test. Social capital had a positive and significant influence on sustainable agriculture through Gapoktan partnerships. The 0-value was recorded at 0.249, with a t-statistic of 3.437 and a p-value of 0.001, confirming a strong mediation effect. This means that the trust, networks, and social norms of *I. reptans* Poir farmers in Balongpanggang District, Gresik, not only directly impact institutional cooperation but also strengthen farming sustainability when facilitated by Gapoktan's role. Therefore, hypothesis H4 is accepted.

However, different results were found for the mediation of farmer motivation. Farmer motivation had a positive but insignificant effect on sustainable agriculture through Gapoktan partnerships. The 0-value of 0.071, with a t-statistic of 1.084 and a p-value of 0.279, indicates that

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although there is a positive trend, the strength of the effect is not sufficient to achieve statistical significance. Therefore, hypothesis H5 is still accepted because the direction of the effect is positive, but its contribution to farming sustainability is relatively weak.

Overall, the results of this study indicate that all hypotheses are accepted, although not all are significant. Three hypotheses (H1, H3, and H4) yield strong and significant positive effects, while the other two hypotheses (H2 and H5) remain positive but insignificant. These findings confirm that the role of Gapoktan is primarily mediated by the strength of social capital, while individual farmer motivation is still insufficient to foster optimal institutional partnerships.

Forum Group Discussion

The FGD results showed that social capital among *I. reptans* Poir farmers in Balongpanggang District is relatively strong at the technical level, but weak in formal institutional aspects. Trust among farmers has been established through the sharing of information regarding fertilizers, pests, and planting techniques. Social networks also operate effectively in informal settings such as meetings in rice fields or coffee shops, while formal forums through the Farmers' Group (Gapoktan) have not yet played a significant role. Traditional social norms that previously governed rice planting schedules have been carried over to kale, for example, in the practice of rotating water use and agreeing on joint planting times. However, the majority of FGD participants emphasized that this social capital is insufficient to strengthen their bargaining position with middlemen or factories. They believed that farmer solidarity only assists with technical and social matters, but does not directly impact pricing or marketing of produce. This reinforces the quantitative findings that the influence of social capital on Gapoktan partnerships is positive but not optimal.

In terms of motivation, most farmers stated that their primary reason for growing *I. reptans Poir* is short-term needs, such as paying for their children's school fees or daily needs. The certainty of middlemen willing to purchase their crops was a dominant factor in maintaining their motivation, even though the prices offered were relatively low. Internal factors such as age, education, experience, and land area also emerged in discussions. Younger farmers tended to be more willing to try innovations, while older farmers were more cautious. Higher levels of education facilitated the adoption of new technologies, but economic needs remained the primary driving force for all groups. Externally, limited business capital and climate risks were often cited as obstacles that dampened enthusiasm, while the availability of markets through middlemen

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actually strengthened short-term motivation. Gapoktan was cited as not playing a significant role in boosting motivation due to a lack of capital and marketing support. Nevertheless, several farmers stated that if Gapoktan could provide price certainty and prompt payment, collective motivation to strengthen Gapoktan's role would significantly increase.

Further findings regarding Gapoktan partnerships revealed a clear gap. Gapoktan in Balongpanggang still focused on rice as its primary commodity, resulting in *I. reptans* Poir not being recognized within the organization's governance structure. Regular meetings rarely discuss water spinach, and to date there are no joint farming programs, special savings and loans, or collective distribution schemes. As a result, farmers feel they are working alone and continue to rely on middlemen. They also gain access to information and technology more from informal networks or middlemen than from the Gapoktan. Yet, many farmers have expressed their desire to work collectively if Gapoktan could provide more practical and profitable business schemes, such as joint fertilizer purchases or marketing contracts with mills. Discussions with Gapoktan administrators confirmed that the main obstacles are the relatively small number of *I. reptans* Poir farmers compared to rice farmers, as well as limited operational capital. Nevertheless, farmers institution is open to the possibility of becoming an official liaison with mills, provided there is a collective commitment from farmers and additional support from village and sub-district governments.

Discussions on sustainable agriculture revealed a high level of awareness among farmers, although practices remain fragmented. Many farmers already use organic fertilizers to maintain soil fertility, although some still mix them with chemical fertilizers to avoid yield declines. They recognize that the soil is looser and more fertile with organic fertilizers, and they are starting to reduce chemical pesticides due to their high costs. Economically, *I. reptans* Poir is seen as providing marginal returns, but is considered essential for maintaining family economic sustainability due to its quick harvest and preventing land from being left fallow. Socially, *I. reptans* Poir cultivation strengthens mutual cooperation through collaborative work during planting and harvesting, although the added value of formal institutions remains absent. Intercropping after the rice harvest is considered a form of efficient land and water use that supports environmental sustainability. FGD participants emphasized that the sustainability of this system is highly dependent on price certainty, institutional support, and guidance from extension workers to ensure more targeted environmentally friendly practices.

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Overall, the FGD results indicate that the potential for social capital, farmer motivation, and environmentally friendly practices exists, but has not yet been converted into institutional strength due to the continued absence of farmer groups in the core functions of the partnership. This narrative emphasizes that the sustainability of *I. reptans* Poir farming in Balongpanggang is still carried out informally, while strengthening the role of Gapoktan is seen as a potential path towards more collective, equitable, and sustainable governance.

DISCUSSION

H1: Social Capital → Gapoktan Partnership

Research findings show that social capital has a positive influence on Gapoktan partnerships, and this is not surprising considering both classical and contemporary literature. Coleman (1990) emphasized social capital as a collective resource that enables individuals to act beyond their personal capacity. Putnam (1994) even demonstrated that trust and social networks build the quality of democratic institutions and public participation. In the context of Balongpanggang farmers, we see that trust between actors, informal networks, and norms of mutual cooperation are deeply rooted, enabling partnerships to form. However, interestingly, the partnerships that are formed actually flow more to middlemen than to Gapoktan.

This phenomenon reveals a paradox. Social capital, which should strengthen formal institutions, is instead absorbed by informal actors (middlemen). Within the framework of institutional theory, this can be interpreted as institutional displacement—when formal institutions fail to absorb social energy, informal actors take over. Middlemen unofficially replace Gapoktan as the center of trust. Pragmatically, this is understandable: middlemen are more responsive, provide instant market access, and are more flexible than the Gapoktan bureaucracy. However, theoretically, this challenges the optimism that social capital always strengthens formal institutions. Instead, social capital strengthens informal structures, which are counterproductive to the goals of agricultural development policy.

The criticism is that Gapoktan fails to utilize existing social capital. However, if viewed from a potential perspective, strong farmer solidarity could serve as a basis for strengthening collective economic institutions. The fact that farmers trust middlemen more indicates a "trust asymmetry": farmers trust informal markets more than they trust formal organizations, which they should have. This demonstrates institutional weaknesses in converting social capital into formal partnerships with bargaining power. Therefore, while the research findings support the hypothesis

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that social capital has a positive effect, we must not ignore the distribution of its effects—that it does not automatically benefit Gapoktan, but can instead foster the power of other parties.

These findings support the research of Prayitno *et al*. (2019) and Nuryati *et al*. (2023), which similarly asserted that social networks, trust, and norms significantly influence agricultural sustainability. However, unlike that study, which emphasized the positive effect of social capital on formal institutions, the results in Balongpanggang show a more complex trend: social capital does not necessarily strengthen Gapoktan but rather benefits informal networks of middlemen. This difference can be explained by the context of location and type of farming. Prayitno *et al*. conducted their research in the context of macro-scale food security, while this study focused on small-scale *I. reptans* Poir. The results also differ slightly from those of Abdurrahman & Suek (2024), who emphasized the potential of social capital to support dryland farming programs in Kupang. In the case of Balongpanggang, this potential exists but is hampered by the dominance of intermediaries. In fact, compared to Widjayanthi *et al*. (2024), who assessed Indonesian farmers' social capital as moderate, in Balongpanggang, the strength of social capital is actually high, but it fails to be channeled to formal institutions. This confirms that the quality of social capital is determined not only by its strength but also by the institutional channels that accommodate it.

H2: Farmer Motivation → Gapoktan Partnership

The research results show a positive influence of motivation on Gapoktan partnerships. However, this positive trend does not necessarily mean strong. Pioneer farmers' motivation to plant *I. reptans* Poir is largely driven by short-term incentives: relatively stable selling prices, a short harvest period, and quick marketing opportunities through middlemen. This illustrates that motivation is more determined by market mechanisms than by institutional roles. Within the framework of expectancy-value theory (Vroom, 1964), motivation arises from the expectation of valuable outcomes. This expectation, in this context, does not come from Gapoktan, but from the informal market.

More interestingly, this motivation stemming from economic pragmatism does not automatically translate into participation in formal institutions. Farmers do not necessarily feel the need to strengthen Gapoktan because they are satisfied with a simpler relationship with middlemen. This is consistent with Dorward *et al*. (2009) analyzed that smallholder farmers are often trapped in market dependency—their motivation follows market direction, not institutional policy. Consequently, while there is a positive influence, it operates at a minimal level. Farmer

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groups have become merely a "secondary option," not the primary motivational orientation for farmers.

From a policy perspective, this signals an institutional crisis. Farmer motivation, which should be a collective energy, has instead been fragmented into individualistic market channels. This means that formal institutions have failed to "absorb" their already high motivation. Farmers institutions like Gapoktan should be able to act as transformational channels that direct individual motivation toward collective and sustainable orientation. The fact that farmers' motivations are not fully translated into Gapoktan partnerships indicates a disconnect between institutional design and the realities of market incentives faced by farmers.

This finding aligns with research by Smith *et al*. (2023), which shows that farmers with social motivations—rather than simply economic ones—are more likely to be oriented toward sustainable practices and community leadership. However, a clear difference is apparent: the motivations of Balongpanggang farmers are more pragmatic and individualistic, while Smith *et al*. emphasize collective, social motivations. This difference can be explained by the type of farming; Smith's research focuses on sustainable farming practices with community support, while in Balongpanggang, *I. reptans* Poir is still considered a secondary commodity to rice. These findings also relate to Swami & Parthasarathy (2024), who emphasized the importance of perceived usefulness and ease in motivating Indian farmers to adopt sustainable practices. The difference is that in the Indian case, motivation is directed toward technical innovation, while in Balongpanggang, motivation is directed toward fast-track marketing channels through middlemen. In terms of intrinsic motivation, the findings of this study also differ from those of Hidrawati *et al*. (2021), who found motivation based on spiritual philosophy in Binongko, Southeast Sulawesi, as a driver of sustainable practices. This difference confirms that farmer motivation is strongly influenced by local culture: in Binongko, it is based on cultural values, in Maharashtra, India, it is based on technological innovation, while in Balongpanggang, it is more pragmatic, focusing on short-term profits.

H3: Gapoktan Partnership → Sustainable Agriculture

In theory, Gapoktan partnerships are expected to be a crucial instrument for sustainable agriculture. Pretty (2003) stated that agricultural sustainability is only possible if there is collective action that ensures the integration of economic, social, and ecological dimensions. This research supports this assumption, as strengthening Gapoktan partnerships has been shown to have a

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positive impact on sustainable agricultural practices. Gapoktan has the potential to facilitate access to superior seeds, provide information on environmentally friendly technologies, and expand market reach more equitably.

However, the problem is that this "potential" has not been fully utilized. The reality in Balongpanggang shows that Gapoktan's role has been reduced more to an administrative function than an economic driver. Rather than being an institutional hub for sustainable agriculture, Gapoktan tends to be viewed as merely an institutional formality. Meanwhile, sustainability at the farmer level is supported more by individual creativity in utilizing post-rice harvest land. Within this framework, Gapoktan's role can be described as "positive but passive": it contributes to sustainable development, but is not the dominant actor driving the process.

This is where an important critique arises: we must not fall into the false optimism that every form of farmer organization automatically supports sustainability. This research demonstrates that, despite its statistically positive impact, Gapoktan's substantive role remains weak. This means that institutions should not be judged solely on their existence, but also on their effectiveness in guiding agricultural practices toward sustainability. Thus, these findings enrich academic discussions: sustainability is not simply a matter of the existence of formal partnerships, but rather the extent to which those partnerships function as "driving engines" that draw on farmers' social and motivational energy.

H4: Social Capital → Gapoktan Partnership → Sustainable Agriculture

Social capital has been shown to have a positive influence on sustainable agriculture, but the strength of this influence cannot be separated from institutional mediation mechanisms. Within North's (1990) institutional theory framework, institutions exist to reduce uncertainty and lower transaction costs, allowing fluid social capital (trust, norms, and networks) to solidify into collective rules. Farmers institution should be a forum that internalizes trust between farmers into a formal social contract, expands networks to external parties, and establishes new norms that underpin sustainability. Thus, social capital does not stop at interpersonal relationships but is converted into governance that extends the scope of sustainability to the community level.

However, research findings reveal a paradox: instead of being channeled to Gapoktan, most of the social capital of *I. reptans* Poir farmers is anchored in middlemen. Trust and strong social networks are directed toward more responsive informal actors, rather than formal institutions. This situation highlights Gapoktan's weakness as an institutional broker. Gapoktan

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fails to fulfill its mediation function because it is unable to offer added value compared to middlemen. Pretty (2003) emphasized that sustainable agriculture requires institutions capable of bridging individual interests with collective goals, but in Balongpanggang, informal actors with no sustainability mandate serve as the bridge.

This limitation is further exacerbated by the small number of *I. reptans* Poir farmers, which is only 35 in the entire Balongpanggang District. This small base does strengthen internal social ties, but at the same time makes the resulting sustainability exclusive. With such small numbers, solidarity and mutual cooperation practices tend to be confined to internal circles, without institutional mechanisms that extend their impact to the larger farming community. Olson (1971) emphasized that small groups easily establish coordination but are prone to creating limited collective action whose benefits are not widespread. This is why, without the mediation of Gapoktan, social capital only produces exclusive sustainability—sustainability that applies to small enclaves, rather than inclusive and systemic sustainability.

This means that, while social capital plays a role, the mediation of farmer groups is key to whether sustainability can be expanded systemically or remain trapped within small enclaves. Informal institutions may be efficient in the short term, but they lack the capacity to regulate ecological norms or ensure the diffusion of innovations. Thus, agricultural sustainability results not only from trust and mutual cooperation, but also from the success of formal institutions in crystallizing social energy into broader, more inclusive, and resilient institutional structures.

H5: Farmer Motivation → Gapoktan Partnership → Sustainable Agriculture

Motivation has been shown to positively influence sustainable agriculture, but this result cannot be separated from institutional mediation. North's (1990) Institutional Theory emphasizes that institutions function as a set of rules that reduce uncertainty and enable collective action. Within this framework, the farmers' institution should act as a transformational channel, directing individual motivation toward a collective orientation that supports sustainability. However, in Balongpanggang, this function has not yet been realized. The motivation of *I. reptans* Poir farmers is driven more by short-term market incentives through middlemen, rather than by institutional facilitation.

Paradoxically, this situation creates a vicious cycle. On the one hand, farmers' motivation to develop *I. reptans* Poir farming is relatively low because they do not perceive a real role for Gapoktan, whether as a seed provider, technical extension and consultation, or as a distributor of

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harvested produce to the market. The absence of this institutional function makes farmers increasingly dependent on middlemen, who are perceived as faster and more practical. On the other hand, from the perspective of the Gapoktan, the group's 35 *I. reptans* Poir farmers is considered too small to open a "new sector" outside its primary focus, rice. Consequently, Gapoktan is reluctant to allocate organizational resources to groups perceived as a minority, thus underestimating their role among *I. reptans* Poir farmers.

This disconnect explains why the analysis results show a positive effect of motivation on sustainability, but it is not statistically significant. The positive direction of the effect may be due to a perception bias among respondents. The questionnaire did not specify whether the term "Gapoktan" refers to rice farmers' groups or *I. reptans* Poir farmers' groups. Thus, some of the 35 respondents may have assumed their experience with rice farmers' groups, while others envisioned the potential of Gapoktan if they managed *I. reptans* Poir. This interpretation bias results in a more positive perception on the surface, although it is not consistently strong enough to be significant.

This situation further emphasizes that without clear and consistent institutional mediation, farmer motivation is trapped in a pragmatic and fragmented pattern. Rather than being directed toward collective and sustainable goals, motivation manifests itself only in individual relationships with informal markets. In the absence of institutional clarity, motivational influence becomes weak, unstable, and difficult to capitalize on as collective strength.

Strategic Reflection: Farmer Groups as Key Actors Replacing Middlemen

The strategic reflections of this research stem from a contrasting reality: the role of the Farmers' Group in cultivating *I. reptans* Poir in Balongpanggang District remains weak, while the vital function of harvest distribution is actually carried out by middlemen. The resulting pattern is simple yet unequal: farmers sell their crops to middlemen, who then forward them to factories, and the factories then distribute the seeds to various regions. This chain is superficially efficient because it cuts through bureaucratic procedures, but it leaves a structural problem: farmers remain at the weakest point. They have no direct access to factories, no distribution margins, and no bargaining power. Middlemen, on the other hand, become the dominant actors, gaining greater profits through simple social capital in the form of personal trust and the ability to arrive on time for harvest. Gapoktan—which, according to Ministerial Regulation 67/2016, is supposed to carry out governance functions, facilitating joint ventures, partnerships, access to information, capital management, and marketing—plays almost no role. This is an institutional paradox: formal

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institutions, which are supposed to be strengthening, are actually less agile than informal mechanisms. This situation raises a radical yet logical idea: what if Gapoktan took over the role of middlemen? This question is not merely utopian, but rather a strategy with real potential to be a game-changer in realizing sustainable agriculture. If Gapoktan took over the distribution function, it would simultaneously fulfill an institutional mandate that has been underperforming. Gapoktan could form a special business unit that collectively distributes harvests to factories, thereby making the distribution chain more efficient, preventing profit margins from leaking to third parties, and ensuring fairer selling prices for farmers. Furthermore, through this new position, Gapoktan could establish long-term contracts with factories, which in turn would provide market certainty for farmers and a stable supply for the factories. In such a situation, Gapoktan elevates from being a mere administrative institution to a strategic economic actor.

Gapoktan's institutional strength lies in its formal legitimacy and social base. From the perspective of North's Institutional Theory (1990), institutions exist to lower transaction costs and mitigate uncertainty. Gapoktan has the capacity to represent farmers in price and quota negotiations with factories, something that would be impossible for farmers to do individually. In other words, Gapoktan can function as a collective bargaining agent, transforming the asymmetrical relationship between farmers and factories into a more symmetrical one. Furthermore, Gapoktan also has the potential to become a center for input-output integration. Beyond distributing harvests, Gapoktan can also take over the distribution of seeds, fertilizers, and other agricultural inputs. This model approximates simple vertical integration at the local level, closing the agribusiness cycle from upstream to downstream.

This role also enables Gapoktan to control quality and quotas. Middlemen typically operate volume-oriented, without regard for quality or sustainability. Conversely, Gapoktan can develop quality standard mechanisms with factories, ensuring that delivered products are more uniform and meet market standards. This function transforms Gapoktan into a quality controller and gatekeeper, ensuring that cultivation practices are moderate and environmentally friendly. From a sustainable agriculture perspective, this step is crucial because it prevents overproduction that damages prices and reduces ecological pressure.

Furthermore, Gapoktan has the potential to become a vehicle for knowledge and technology transfer. Its institutional position between farmers and factories makes it ideal as a knowledge intermediary. Through formal partnerships, factories can channel technical training,

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extension services, and cultivation innovation standards directly through the agricultural institution. In this way, Gapoktan not only facilitates distribution but also acts as a learning organization that strengthens farmers' innovation capacity. From the perspective of Stakeholder Theory (Freeman, 1984), Gapoktan plays a key role as a stakeholder, balancing the interests of farmers, factories, and the government.

This transformation clearly yields win-win benefits. Farmers receive better prices, market certainty, and a stronger bargaining position. Gapoktan gains a new source of income from distribution margins, which simultaneously strengthens its legitimacy among its members. Factories also benefit from stable supplies, more uniform quality, and lower coordination costs. In short, Gapoktan's repositioning goes beyond simply "displacing" middlemen, but also toward establishing a healthier, fairer, and more sustainable agribusiness ecosystem.

However, reaching this point requires realistic, practical steps. The first stage is intensive outreach to ensure farmers understand the benefits of the new scheme. Social capital in the form of trust and mutual cooperation needs to be directed within an institutional framework, not just personal relationships with middlemen. The second stage requires Gapoktan to initiate negotiations with factories, even if only on a small scale as a pilot project. This will foster broader institutional trust. Furthermore, Gapoktan needs to establish a formal business unit in the form of a cooperative or joint venture as a legal basis for managing distribution. At the same time, Gapoktan can expand its participation base by inviting more rice farmers to grow *I. reptans* Poir, significantly increasing the current minority (35). External support from the agricultural office, extension agencies, or NGOs needs to be leveraged to strengthen capital, managerial capacity, and technology.

If this strategy is implemented consistently, transforming Gapoktan into a replacement for middlemen will not be just a dream, but a real possibility. Furthermore, this transformation will reconnect the farmers' previously scattered social capital and motivation into a formal, strong, and sustainable institutional structure. Farmers' pragmatic motivations can be redirected toward collective motivation that also considers social and ecological aspects. The social capital that previously strengthened the informal middleman network can be crystallized into institutional energy that supports sustainability. Thus, sustainable agriculture will no longer be a mere slogan but will be realized in concrete practices that are fair to farmers, beneficial to factories, and profitable to villages.

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4. CONCLUSIONS

Social capital and farmer motivation have proven to be crucial foundations for building institutional dynamics, although both still primarily function within the technical realm and short-term needs. Trust, social networks, and shared norms keep *I. reptans* Poir farmers united in their daily cultivation practices, but this solidarity is insufficient to strengthen their bargaining position in the market without stronger institutional support. Similarly, motivations stemming from family economic needs and market certainty through middlemen make farmers more pragmatic; a long-term orientation remains hampered by the lack of price guarantees or adequate access to capital.

In this situation, the role of the agricultural institution appears to be key. This institution is not yet fully present for *I. reptans* Poir farmers, as the focus is still on rice as the primary commodity. However, when Gapoktan's functions are fully implemented—from production management and distribution to facilitating capital and access to technology—it has the potential to become a catalyst that channels social power and farmer motivation toward a more organized approach. This demonstrates that the Gapoktan partnership is not merely an administrative link, but rather a bridge that enables farmers' collective energy to be converted into real bargaining power.

Sustainable agriculture has emerged as a desirable horizon. Organic fertilization practices, mutual cooperation in planting and harvesting, and intercropping after rice have already demonstrated the seeds of sustainability at the local level. However, complete sustainability—economic, social, and environmental—will only be realized if village institutions, through Gapoktan, are able to take over the strategic functions previously held by middlemen. Price certainty, fair payment, and access to innovation are key requirements so that social solidarity and individual motivation do not stop at the land, but instead transform into a more equitable and resilient agribusiness system.

The next direction is to test Gapoktan's courage to take on a position as an official aggregator of harvested crops. A pilot scheme facilitated by villages and sub-districts could be a first step in demonstrating that institutional channels can benefit not only farmers but also factories and Gapoktan itself. If proven successful, this model will pave the way for a more sustainable, inclusive, and long-term farming system for *I. reptans* Poir.

This study is subject to several limitations that should be acknowledged. The most significant constraint is the limited number of respondents, as only 35 *I. reptans* Poir pioneer farmers were identified in Balongpanggang District. This small sample size reflects the actual

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condition in the field, where the number of pioneer farmers cultivating this commodity remains minimal. Consequently, the generalisability of the statistical results is limited, and caution should be exercised in extrapolating the findings to broader contexts. Future research could extend the scope of investigation to other districts or regions where the population of pioneer farmers is larger, thereby allowing for comparative analysis and more robust validation of the proposed institutional mediation model.

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