Pricing of Fresh Fruit Bunches (FFB) From Oil Palm in Riau Province, Indonesia: Developing A Collaborative Governance Model for Sustainable Agriculture

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Abstract

The Riau provincial government has formed an oil palm Fresh Fruit Bunch (FFB) pricing team to accelerate the implementation of prices and partnerships. However, most independent smallholders do not partner with palm oil mills, resulting in non-compliance with government regulations. The study aims to analyze the roles of actors and collaborative governance dynamics, as well as factors influencing success. The research method combines quantitative and qualitative data collection, with data collected through questionnaires, observations, and in-depth interviews. The collaborative model aims to support stakeholders, including NGOs, academics, and affected communities, with a focus on achieving fair prices and sustainable agriculture.

Keywords: *Sustainable Agriculture, Collaborative Governance, Food Security, Palm Oil*

INTRODUCTION

The palm oil industry in Riau Province, covering 2.8 million hectares, significantly impacts the welfare of the community. While it contributes to the local economy through increased employment and improved welfare, it also poses environmental issues, economic inequality, and social conflicts between smallholders. Despite these challenges, the industry remains a significant economic source in the region. The imbalance in farmers' prices is due to the discrepancy between their prices and government regulations, affecting only those working with palm oil processing factories. To achieve the SDGs' second goal, agricultural issues, particularly the palm oil industry, need to be addressed. Farmers need to form farmer groups to partner, but this often doesn't align with their needs or the context of their problems, rather than institutional strengthening. In the era of globalisation, economic development necessitates the involvement of all stakeholders, with the government playing a dominant role. Collaborative governance, a new approach, involves government, communities, academics, businesses, and the media working together to achieve development. Studies on collaborative governance in the palm oil industry show cooperation to avoid deforestation and sustainable palm oil management. For example, the Central Mamuju District Government and PT Astra Agro Lestari have successfully solved problems related to oil palm production for local farmers through collaborative governance.

The purchase price of oil palm FFB in Riau Province faces challenges that require collaboration with other sectors. The Plantation Office alone cannot solve these problems, and collaboration with other sectors is necessary. The Jaga Zapin Task Force was established to monitor compliance with regulations, including the purchase price of oil palm FFB in Riau Province. The K Index, an integral part of the palm oil FFB formula, has been criticized for favoring corporate interests, leading to a high value-added gap between farmers and mills. Empowering independent smallholders is not solely the responsibility of the government, but multi-sectoral cooperation is crucial for achieving fair prices. Coordination between government, palm oil company associations, and farmer associations is seen as a way to achieve this goal. Previous studies have highlighted the importance of collaboration in the palm oil management sector, highlighting the influence of collaborative actors on sustainable governance. Regulations

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prioritize environment-based management, and the number of certified farmers is increasing. However, social conflict and deforestation still require multi-sectoral collaboration to address, highlighting the need for further collaboration.

The palm oil industry's collaborative governance is a topic of interest, but research on actors' role in setting oil palm FFB prices remains limited. The study aims to fill these gaps by examining the dynamics between stakeholders in the context of collaborative governance in setting oil palm FFB prices in Riau Province. This research aims to achieve social justice in sustainable agriculture.

LITERATURE REVIEW

Collaborative governance is a forum used to achieve a goal. Argue that collaborative governance is a state in which government achieves public goals through collaboration between organisations and individuals. Collaborative governance can also describe a state of interdependence between actors. Specifically, define collaborative governance as the processes and structures of public policy decision-making and management that involve people across public institutions, levels of government, and/or public, private and social boundaries to achieve public goals that would not otherwise be achieved. This broad definition of collaborative governance provides the basis for developing a comprehensive framework for comparative and integrative empirical analysis across a range of theoretical, normative and applied perspectives.

Collaborative Governance Actors in FFB Pricing in Riau Province

The triple helix model of stakeholder collaboration in oil palm FFB pricing in Riau Province involves the government, private sector, and community actors. The government regulates and sets prices, while palm oil companies collect and present data on production costs and market dynamics. Community organizations and the general public safeguard and express community interests in relation to FFB prices. The triple helix connects the three worlds: business, government, and academia. The government provides incentives, the private sector provides stable contractual relationships, and universities serve as the source of new technologies and knowledge. The triple helix model allows for a comprehensive study of the economic knowledge base of the palm oil industry in terms of community support for local development. It also considers environmental and sustainability factors when making decisions on FFB prices.

The Triple Helix (TH) model, a concept in helix thinking, involves universities, industry, and government in a public innovation system. The Quadruple Helix (QH) adds community involvement in decision-making. The Pentahelix (PH) system, a new term, includes social entrepreneurs, activists, practitioners, and bureaucrats. It emphasizes the active role of society as a systemic agent of social innovation. The Penta Helix model is useful when dealing with multiple stakeholders with different interests. The study aims to analyze the framework of actors involved in setting the purchase price of oil palm FFB in Riau Province. Governance in FFB pricing aims to create rules that mediate between competing claims to oil palm and its resources, achieving more democratic pricing. Governance involves mediating between different institutional structures and social actors and their relationship to power, both political and financial.

Success Factors for Collaboration

Measuring the success of collaborative governance is important because it can provide an overview of the impact and effectiveness of the collaboration. Through measurement, researchers can also determine whether the collaboration has achieved the desired goals. Finally, measurement is also important to improve the quality and impact of the collaboration.

The researcher used analytical knife, which explains that all types of successfully managed networks must have evaluation elements. However, these elements vary depending on the type of network. There are several factors that are indicators of the success of a network or collaboration in governance, namely: 1) Networked Structure; 2) Commitment to a Common Purpose; 3) Trust Among The Participants; 4) Governance; 5) Access to Authority; 6) Distributive Accountability / Responsibility; 7) Information Sharing; 8) Access to Resources.

METHODS

This research employs a pragmatist approach, combining quantitative and qualitative data analysis to explore the implementation of collaboration among actors in setting the purchase price of oil palm FFB in Riau Province. The research site is the Plantation Office, and field observations are conducted in various farmer groups, associations, and palm oil business associations. The research distinguishes units of analysis based on the research question, with the first formulation focusing on government policy makers, the second on individual farmers, and the third on propability sampling. Data is collected through questionnaires, observations, and interviews. Qualitative analysis is conducted using Nvivo 12 software, while quantitative analysis uses structured equation modeling (SEM) techniques with partial least square (SEM-PLS) type using Smart PLS version 4 software. The fourth research formulation uses interactive analysis, identifying roles involved in price-fixing cooperation for sustainable agriculture, making inferences based on data identification, and analyzing the data according to research objectives.

RESULTS

Overview

The palm oil industry, crucial for the Riau province's GDP, is facing criticism for price inequality, particularly between partner and non-partner oil palm farmers. Despite regulations, there is a price imbalance, particularly for independent smallholders who sell oil palm FFB to middlemen. Research in In-dragiri Hulu, Kampar, and Bengkalis reveals that most regions do not set FFB purchase prices in line with the Riau Provincial Plantation Office, resulting in losses for independent smallholders and vulnerability to monopoly due to lack of guidance and supervision.

Existing Oil Palm FFB Price Fixing in Riau Province

Actors in the Collaboration on Palm Oil FFB Pricing in Riau Province

Collaboration in policy-making involves actors such as the government, experts, NGOs, companies, civil society, and organizations. The Triple Helix (TH) model conceptualizes public innovation and knowledge flows in an open public innovation system. The Quadruple Helix (QH) adds public participation in decision-making. The Pentahelix emphasizes the active role of the community in driving vertical systematic innovation. In Riau Province, a multi-stakeholder team was formed to determine FFB prices in accordance with regulations. The Governor, through the Plantation Office, collaborated with the Riau Attorney General's Office, academics, NGOs, and the media to improve the efficiency and fairness of the pricing process and support the palm oil industry's sustainability efforts. The team also collaborated with non-partner farmer groups, local NGOs, and national NGOs. However, the triple helix concept's role was not fully realized, leading researchers to seek other actors, such as NGOs, academics, media, and the Attorney General's Office.
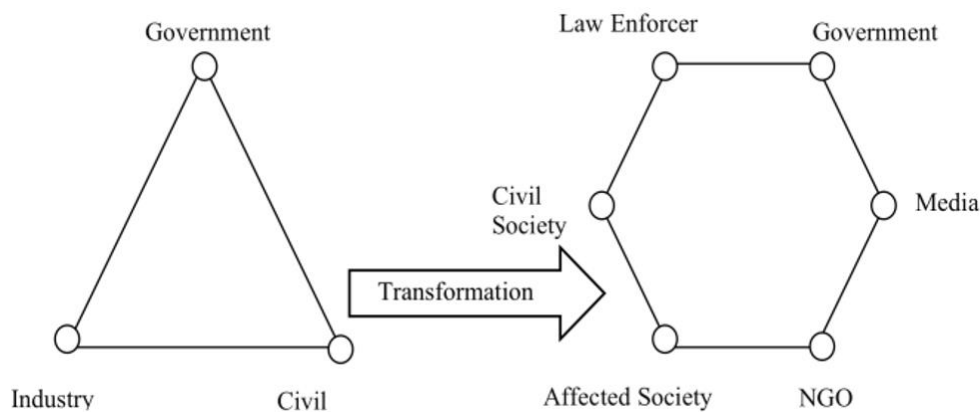

Figure 1. Changing Triple Helix to Hepta Helix in FFB Pricing

Actors' Roles in Collaboration

Based on the results of the interviews conducted by the researchers, the actors involved in setting FFB prices in Riau Province have played roles that are in line with their areas of expertise and competence. For example, the government acts as a facilitator through regulations and policy formulations that facilitate collaboration between academia and industry. In the quadruple helix model, however, academics are involved as the link between knowledge and industry. Thus, with the role of different actors and according to their fields, it is expected to have a positive impact in determining the FFB price policy for farmers in Riau Province.

Collaborative Innovation in Palm Oil FFB Pricing in Riau Province

In addition to maximising the role of each actor, the government also created various programmes to accelerate partnerships, such as seminar programmes conducted by the Ministry of Agriculture GAPKI and APKASINDO, conducting direct socialisation by inviting PKS farmer groups related to law enforcement in the palm oil industry trading system by the Attorney General's Office. The existence of this collaboration, researchers formulated several policy innovations that have been produced by the FFB Pricing Team in Riau Province.

Effectiveness of Collaboration on palm oil FFB pricing in Riau Province

The role of each collaborating actor has resulted in policy innovation. Expert opinion shows that effective collaboration produces effective bureaucracy as well (Swann, 2017). Whereas in this study, researchers found that the collaboration had positive impacts such as; 1) accountability; 2) credibility; 3) organisational conflict management; 4) participation; and 5) legitimacy.

Case study of collaborative governance for oil palm FFB price setting in Riau Province

Collaborative Governance Regime (CGR) is an integrated framework with a cross-border collaboration system. In this study, researchers formulated a framework adapted from the work of.
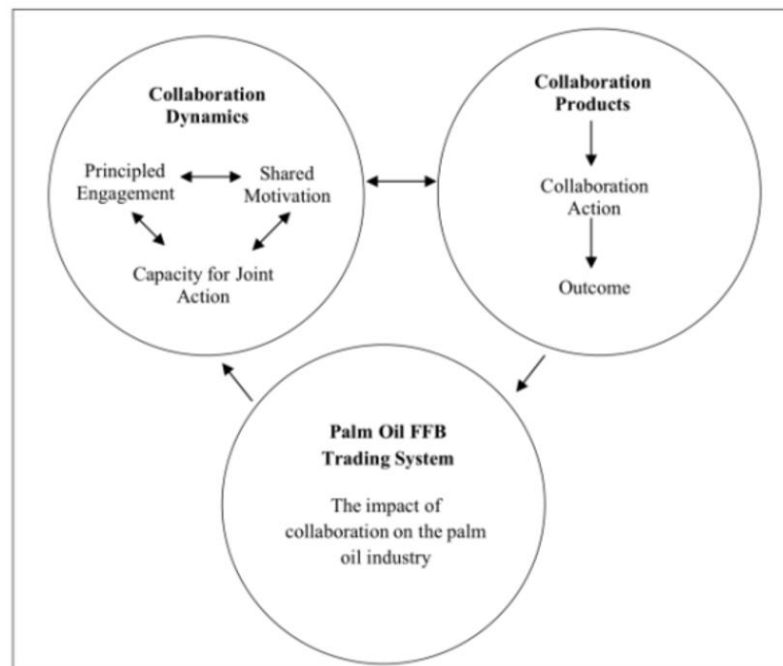

Figure 2. Conceptual Framework

In the context of figuring out the FFB purchase price, CGR can assist in explaining how collaborative approach can be used to achieve consensus across the industry's complexities, particularly in related to oil palm. This is particularly

possible due to the CGR framework provides a significant value on participation of actors from a variety of sectors, such as governments, local communities, oil palm farmers, and producers of palm oil. Actor participation ensures that all interests are taken into consideration. Partners can work collaboratively to determine a fair and sustainable price for oil palm FFB through the CGR framework. This generates satisfaction and trust in the FFB pricing policy for palm oil in the Province of Riau.

Principled Engagement in Collaboration

Principled engagement involves inviting appropriate individuals to meetings for open discussions, allowing diverse actors to collaborate across sectors to solve problems and develop shared values. The researcher identified three primary stakeholder groups: governments, corporations, and communities, with ride-sharing businesses and users being particularly interested. By incorporating principled engagement, price-setting processes can be more transparent and free from uncertainties, potentially ensuring the survival of oil palm farmers. The researchers classified principled engagement into three main parts: principle of collaboration, open communication, and decision-making process. The principle of collaboration in the FFB pricing setting is based on seven principles: honesty, trust, professionalism, openness, responsibility, fairness, and mutual respect. Effective communication is crucial for successful decision-making, with principles such as mutual respect, diversity, joint consensus, and continuous communication. The team communicates weekly, using WhatsApp and Zoom for meetings outside the city. The decision-making process considers regulation, consensus, objective decision-making, and professionalism. Researchers used Nvivo to analyze word frequency queries and cluster analysis to identify collaboration and communication terms. The findings showed a significant relationship between various nodes in the collaboration context. Mutual respect builds trust within the team, while high professionalism contributes to honesty and trust. The study highlights the importance of collaboration and communication in achieving collaborative goals.

Shared Motivation

Shared motivation, also known as social capital, encourages collaboration within an organization. It involves mutual trust, understanding, and commitment. The research found that collaboration is the most common word for shared motivation, followed by determination, which involves agreeing to set a fair FFB price for all stakeholders. Understanding is crucial for all actors involved in collaboration to achieve the same objectives. Regulation and fairness are also important, as established regulations aim to formulate an equitable FFB price.

Researchers conducted a cluster analysis to identify relationships between shared motivation, transparency, honesty, commitment, collaboration value, quality of supporting data, and collaboration value. Responsibility also relates to honesty. The vision of collaboration is linked to a conducive palm oil industry climate and the value of collaboration. Trust and commitment are crucial for success in determining oil palm FFB purchase price.

Capacity to Joint Action

This study examines the dynamics of collaboration in the palm oil industry, focusing on three dimensions: institutional procedural arrangements, leadership and knowledge, and resources. The research found that leadership plays a crucial role in successful collaboration, involving facilitators, managers, participants, public policymakers, and technical experts. Regulations are also considered an important basis for conducting collaboration. Resources, including financial and human resources, are essential for setting the FFB purchase price and providing insights relevant to the trade and progress of the palm oil industry. Word frequency analysis revealed that price and farmers are frequently associated with collaboration. Financial resources are related to companies, government, associations, and personal, while human resources are related to the provision of rewards or gifts. These functional elements are crucial for strengthening principled engagement and shared motivation over time.

Validation of Findings

The research explores the formation of Central Government-led Groups (CGR) in the palm oil industry, focusing on the FFB purchase price determination team. The government, under the Minister of Agriculture Regulation Number 1, mandates local governments to organize a pricing team. However, the team struggles with data access

and faces challenges such as underprivileged farmer organizations and firm rejection. To address these issues, the team leader partnered with the Governor of Riau Province to establish a "Zapin Guard Task Force." The team's flexibility was also a challenge due to government regulations. The study also examined team dynamics, focusing on principled engagement, capacity to joint action, and shared motivation. The findings suggest that collaboration requires trust, shared understanding, internal legitimacy, and commitment, while joint action requires organizational design, resources, leadership, and expertise. The government, through the Plantation Service, acts as an initiator, facilitator, communicator, and mediator in collaboration.

The Influence of Collaborative Governance Regimes on the Implementation of Palm Oil FFB Pricing Policies

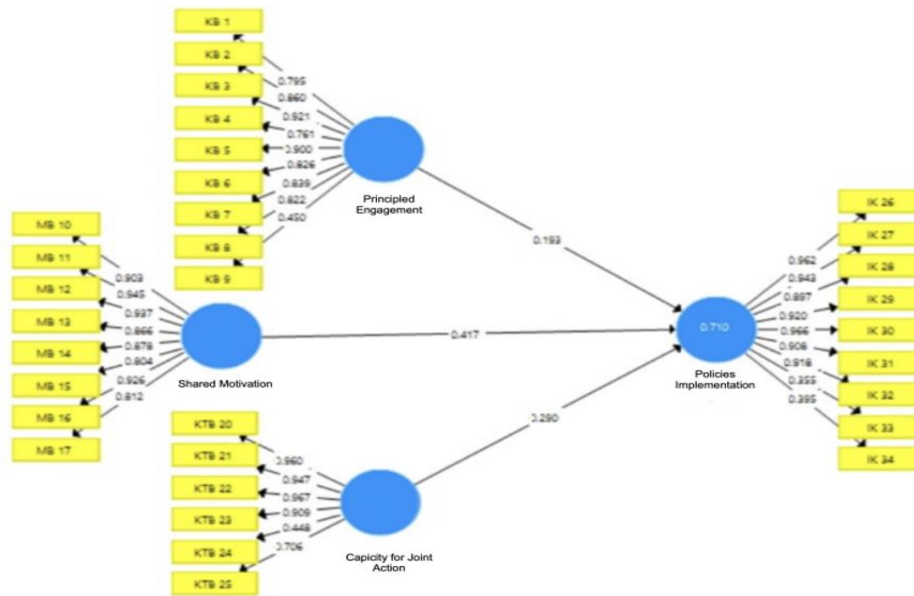### Evaluation of the Outer Model (Measurement Model)

Figure 3. Outer Model Analysis Results

The outer loading factor results indicate that indicators IK 33, 34, KB 9, and KTB 24 have values below 0.5, indicating they must be deleted to validate the model. The Smart PLS analysis shows that the construct has a higher loading factor value than other constructs, confirming its discriminant validity. Measurement consistency tests using Average Variance Extract and composite reliability show that the indicators are valid in measuring latent variables and the measurement model's reliability is good.

Table 1. Reliability value of exogenous constructs against endogenous constructs

	CR	AVE	Conclusion
Policy Implementation	0,980	0,878	Good Reliability
Capacity to Joint Action	0,958	0,822	Good Reliability
Principled Engagement	0,951	0,710	Good Reliability
Shared Motivation	0,967	0,784	Good Reliability

The next, see at the significance of the outer model. Based on the analysis results, it showed that all indicators have a p-value <0.05. So it can be concluded that all variables have a significant influence.

Table 2. Significance of the Outer Model

	Original sample	T Statistic	P-Values	Conc
Capacity to Joint Action -> Policy Implementation	0,288	2,014	0,045	Sign
Principled Engagement -> Policy Implementation	0,139	0,779	0,036	Sign
Shared Motivation -> Policy Implementation	0,450	2,301	0,022	Sign

Inner Model Evaluation

This study evaluates the structural model's predictive ability using R Square, Q Square, quality index (GoF), and path coefficient values. The implementation policy has a strong relationship with the exogenous construct, with an R Square value of 0.677. The overall quality of the research model is high, with a GoF value of 0.729.

Table 3. Goodness of Fit (GoF)

	R Square	AVE
Policy Implementation		0,878
Capacity to Joint Action	0,677	0,822
Principled Engagement		0,710
Shared Motivation		0,784
Mean	**0,677**	**0,798**

So it can be calculated:

$$GoF = \sqrt{Average \_ R2 * Average \_ Communalty}$$

$$GoF = \sqrt{0,677 * 0,798}$$

$$GoF = \sqrt{0,532266}$$

$$GoF = 0,729$$

Table 4. Path Coefficient

	Original sample	T Statistic	P-Value	STDEV
Capacity to Joint Action -> Policy Implementation	0,288	2,014	0,045	0,143
Principled Engagement -> Policy Implementation	0,139	0,779	0,436	0,179
Shared Motivation -> Policy Implementation	0,450	2,301	0,022	0,196

The calculation results show that the three hypotheses proposed, only hypothesis 2 does not meet the requirements, which means the second hypothesis is **rejected**.

Analysis of Interpretation of Research Results

The study reveals that the capacity to joint action positively affects policy implementation in the palm oil (FFB) sector. The government released regulations, such as Minister of Agriculture Regulation 01/PERMENTAN/KB.120/1/2018, to determine purchase prices for FFB products. These regulations encourage farmers and companies with close connections to the palm oil sector to adhere to them. The success of these regulations is attributed to the shared goal of all parties involved. The study also found that leadership plays a crucial role in maximizing access to resources, both human and financial, in FFB pricing. The government's actions in formulating regulations and working with various parties to form an FFB purchase price setting team have had a positive impact on the implementation of FFB price setting policy in Riau Province. Principled engagement has no positive effect on policy implementation due to the complexity of the FFB pricing process. Collaboration plays an important role in the policy implementation process, but it can be hindered by factors such as poor legal and socio-economic environment, poor planning, high staff turnover, lack of participation and imbalance of representative institutions, and limited communication among stakeholders. Shared motivation has a positive effect on policy implementation, as it involves mutual trust, shared understanding, internal legitimacy, and commitment. Building trust and commitment is essential for the collaborative process, and it can increase as the intensity of stakeholder meetings increases. Shared motivation in promoting collaborative governance plays an important role in local economic development and improving community welfare in Sumenep District. In conclusion, the study suggests that the effectiveness of government regulations, particularly in setting FFB prices, depends on the commitment and cooperation of all actors..

Model of Oil Palm FFB Pricing in Riau Province

The pricing of oil palm FFB in Riau Province is divided into three clusters: Jaga Zapin Team, government-formed price-setting team, and civil society, academics, and media. These clusters aim to improve plantation governance, maintain price stability, and regulate fairness to farmers and companies. However, the lack of synergy between these actors makes it difficult for independent smallholders to partner and get the government-set price. Currently, there are only 10 farmer groups and 11 cooperatives in partnership in Riau, with a total land area of 4,647.64 ha. The study compares qualitative and quantitative analyses to understand the factors influencing collaborative governance in FFB pricing. Key factors identified include shared motivation, leadership, knowledge sharing, trust, and capacity to joint action. Although there is no clear relationship between principled engagement and policy implementation, these principles are still important in operating a collaborative governance model. The quantitative analysis, using smart PLS, supports Hypothesis 1, Policy implementation, and Shared Motivation and Policy Implementation.
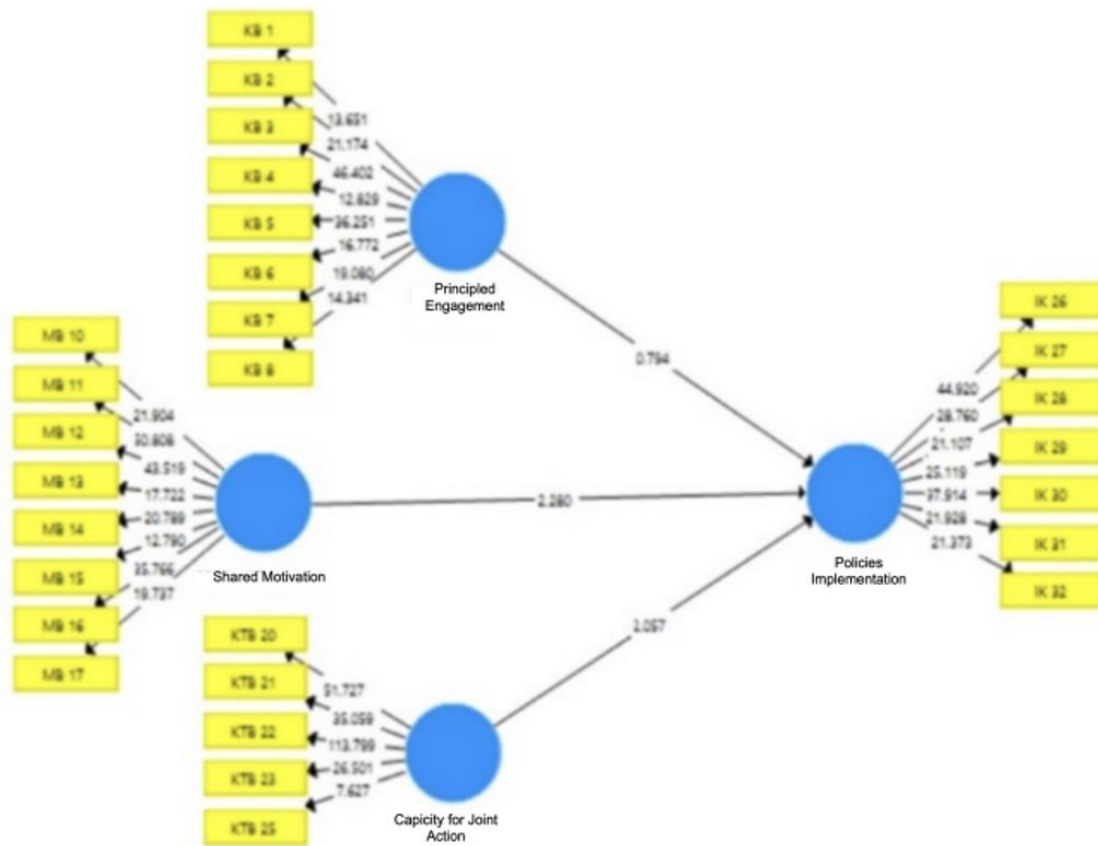

Figure 4. Relationship between endogenous and exogenous variables

The qualitative and quantitative analyses provide a comprehensive understanding of collaborative governance in the implementation of oil palm FFB pricing in Riau Province. The long trading system has not maintained price stability at the farm level, and partial working patterns between stakeholders exacerbate the situation. Challenges in forest management and development include poor forest capacity, inadequate implementation of plans, lack of focus by NGOs, ineffective forest management by government agencies, inadequate forest management administration, and lack of stakeholder cooperation. A collaborative model for FFB pricing in Riau Province has been designed, involving NGOs, scientists, and affected communities, with the aim of achieving fair prices and sustainable agriculture. The model consists of four quadrants: policy formulation, stakeholders, financing, and monitoring for supply chain stability and monopoly prevention.
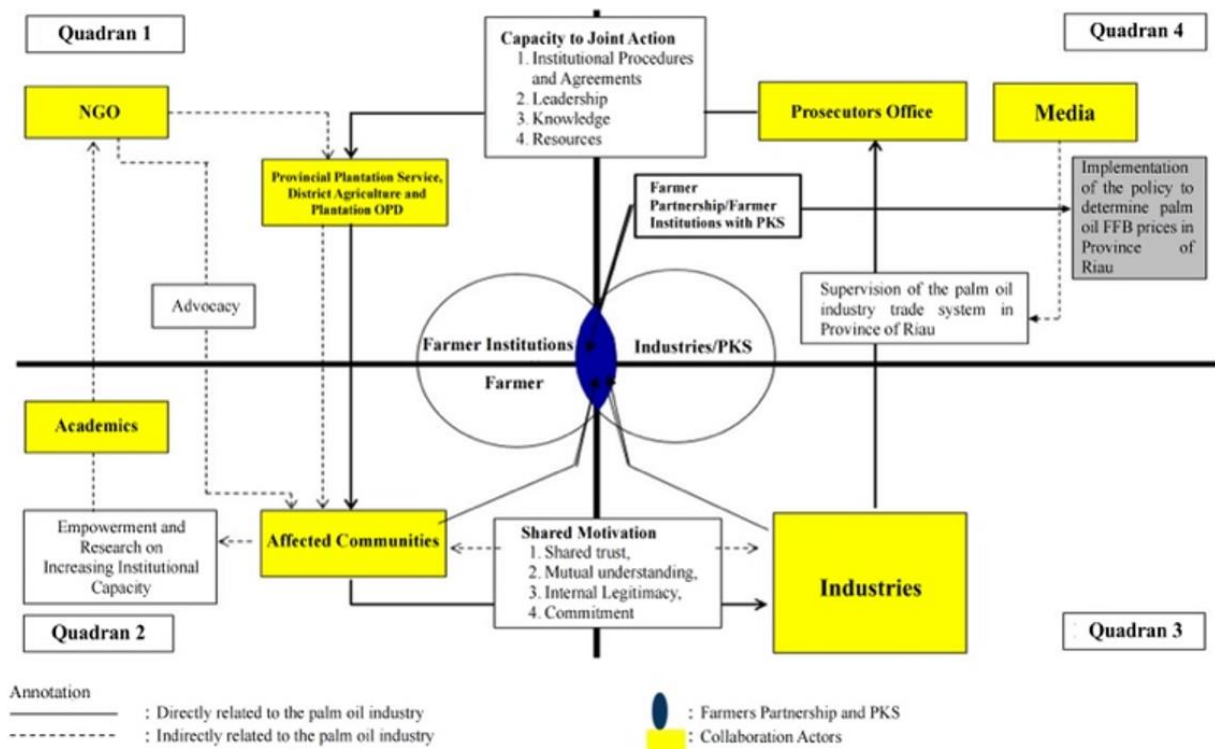
Figure 5. Model of Collaborative Policy for FFB Pricing in Riau Province

DISCUSSION

The palm oil FFB pricing team suffered difficulties during implementation because the industry did not supply all supporting data (PKS). To deal with the problem, the Riau High Prosecutor's Office and the regional government formed the Zapin Security Task Force to control palm oil FFB price setting. The team collaborates with other institutions to ensure that the FFB price determination and implementation process works effectively. The study's findings indicate that leadership is critical to the effectiveness of collaboration. Shared motivation and capacity to joint action also influence the implementation of FFB price policies. In the collaborative process, the government acts as an initiator, facilitator, communicator, and mediator. Human and financial resources are also crucial in partnerships. The capacity to joint action has significant effects on the effectiveness of FFB price policy implementation, whereas principled engagement has a small impact. The concepts of fairness, equity, and commitment play an essential role in ensuring that decisions consider the interests of all stakeholders precisely. The collaborative model for implementing FFB pricing in Riau Province aims to establish partnership between various stakeholders, with an emphasis on effective and sustainable pricing practices. This model integrates the government, academics, NGOs, and the business industry in a variety of programs that focus on increasing company efficiency and competitiveness while additionally encouraging fairness between industry players in Riau Province.

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