

An Examination of The Mapping Stakeholders in The Institutional Strengthening of Maize Farmers in Jeneponto District, Indonesia

Rasdiana Mudatsir^{1,2,*}, Sitti Bulkis³, Muhammad Hatta Jamil³ and Rahmadanih³

¹Doctoral Program in Agricultural Science, Graduate School of Hasanuddin University, Makassar, Indonesia; ²Agribusiness Study Program, Faculty of Agriculture, Muhammadiyah Makassar University, Makassar, Indonesia; ³Department of Socio-Economics of Agriculture, Faculty of Agriculture, Hasanuddin University, Makassar, Indonesia

*Corresponding author's e-mail: rasdianamudatsir@unismuh.ac.id

Increasing maize productivity in Jeneponto District requires the involvement of competitive and interested stakeholders. Stakeholder mapping is important because it helps to understand the relationships between stakeholders, identify their level of importance and influence in strengthening farmer institutions, and facilitate coordination and collaboration to improve the effectiveness of agricultural development policies and programs. This study aims to identify and map the stakeholders that play a role in the institutional strengthening of maize farmers in Jeneponto District. The study used purposive sampling method to determine relevant informants and stakeholder analysis to understand their influence and interests. The results showed that institutional strengthening of maize farmers requires the active collaboration of stakeholders identified in this study including three sectors: Public Sector: Agricultural Extension Center, Village Government, Agriculture Office, Food Security Office, Regional Development Planning Agency, Regional House of Representatives (DPRD), and Batangkaluku Agricultural Training Center (BBPP); Voluntary Sector: Non-Governmental Organizations (NGOs), Village-Owned Enterprises (BUMDes), Universities, National outstanding farmer and fisherman association, and the Self-Help Agricultural and Rural Training Center (P4S); Private Sector: PT Jiva Agriculture Indonesia, PT Bisi International Tbk, fertiliser distributors, farm shops, and agricultural product traders. The findings of this study provide the basis for strategy recommendations for farmer institutional strengthening, multi-stakeholder collaboration, technological innovation and research, access to capital and markets, regulation and sustainable policies.

Keywords: Stakeholders, farmer institutions, institutional strengthening, stakeholder analysis.

INTRODUCTION

Maize is one of the main agricultural commodities in Indonesia that has a strategic role in food security, animal feed, and industrial raw materials (Irsan *et al.*, 2020; Rahayu *et al.*, 2022). Maize is the main food crop in Jeneponto District, South Sulawesi Province and several other regions in Indonesia. Efforts to increase maize production depend not only on the technical aspects of agriculture but also on the institutional system that supports farmers in accessing resources, technology and markets (Latifa *et al.*, 2023; Stupak, 2016). However, despite this potential, maize farmers still face various challenges, such as limited access to markets, capital, and technology, weak institutional roles of maize farmers (Rwamigisa *et al.*, 2018), and suboptimal coordination between stakeholders (Musadar and Abidin, 2020).

Strengthening farmer institutions is one of the key strategies in improving the competitiveness and welfare of maize farmers (Dlangalala and Mudhara, 2020; Samsi *et al.*, 2023). In the context of institutional strengthening, successful development of the agricultural sector does not rely solely on farmer institutions, but also requires support from various stakeholders (Niyazmetov *et al.*, 2021), including farmers, government agencies, NGOs, and private sector actor (Di Iacovo *et al.*, 2017). To achieve this, stakeholder mapping is needed to understand the role and contribution of each actor in maize farming (Banda, 2022; Nalumu *et al.*, 2021; Tuna *et al.*, 2019).

Several previous studies have identified the important role of institutions in agricultural development. Arsyad *et al.* (2021) emphasized that coordination between institutions involved in strengthening farmers' institutions must be done by considering the position of institutions in the agribusiness

Mudatsir, R., S. Bulkis, M.H. Jamil and Rahmadanih. 2025. An examination of the mapping stakeholders in the institutional strengthening of maize farmers in Jeneponto District, Indonesia. *Journal of Global Innovations in Agricultural Sciences* 13:643-654.

[Received 5 Nov 2024; Accepted 25 Feb 2025; Published 2 Apr 2025]



Attribution 4.0 International (CC BY 4.0)

system, either as independent, linked, or dependent institutions. In addition, research by Managanta *et al.* (2019) identified that institutions in the agricultural sector cover various aspects, such as input provision, cultivation activities, management of agricultural products, marketing, and other supporting institutions.

Various studies in Indonesia confirm that collaboration between farmers and stakeholders, including the government, agricultural extension, and financial institutions, is crucial in strengthening maize farmers' institutions to increase the independence, productivity, and welfare of maize farmers in Indonesia (Sariati *et al.*, 2023).

One approach used in understanding the dynamics of stakeholder roles in agricultural institutions is stakeholder mapping. This approach allows the identification of the main actors in the agricultural system and how they relate to and are interested in institutional strengthening of maize farmers (Schwlich *et al.*, 2012). However, research on stakeholder mapping in the context of institutional strengthening of maize farmers in Indonesia is still limited, especially in examining the interaction and influence of various sectors, such as government, private sector, academia, and community organizations.

Most previous studies have focused on strengthening farmer institutions from the internal side of the farmer institution itself, such as the formation of farmer groups and cooperatives (Rustinsyah, 2019). However, there are not many studies that systematically analyze the involvement of stakeholders, ranging from the public sector, voluntary sector, to the private sector in supporting farmer institutions. In addition, studies on how stakeholder mapping can be used to design policy strategies for strengthening maize farmer institutions are still very limited. Therefore, using the theoretical framework of local institutions (Uphoff, 1992), this study offers a more comprehensive approach in analyzing stakeholder mapping in the institutional strengthening of maize farmers. By using a more systematic stakeholder analysis method, this study aims to identify and map stakeholders based on their influence and interests in the institutional system of maize farmers in Indonesia. By understanding the roles and relationships of stakeholders in the institutional system, this research is expected to contribute to the development of more inclusive and sustainable agricultural policies and strengthen the competitiveness of maize farmers in Indonesia.

MATERIALS AND METHODS

Location and time of the study: This research was conducted in Jeneponto District, chosen because it is the center of maize development in South Sulawesi Province (Figure 1).

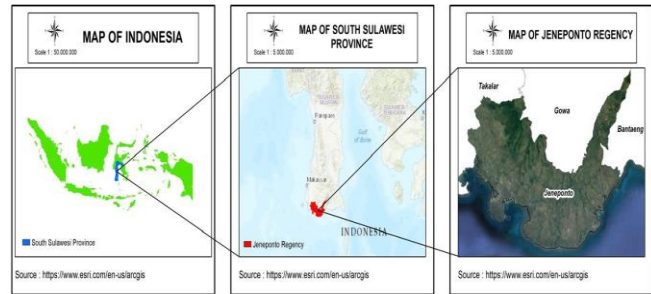


Figure 1. Map of research location.

Data collection techniques: The research used a qualitative approach, which in a qualitative approach uses key informants as a source of data and information needed. Initial data was obtained through interviews with key informants, leaders of government agencies, private parties, and related communities. Determination of informants using purposive sampling techniques. The criteria used to determine informants in this study are informants who have direct involvement in the institutional strengthening program for maize farmers, have authority or influence in agricultural policies and program implementation, understand the relationship between stakeholders in the agricultural institutional system. Representatives from government agencies, private institutions, community organizations, or farmer groups. Informants in this study were stakeholders at the government level, namely, the agriculture office, food security office, BBPP Batangkaluku, private stakeholders, namely fertilizer distributors and production facilities companies.

The data collected were primary data and secondary data. Primary data was obtained through in-depth interviews with agency leaders regarding their role in the institutional strengthening of maize farmers. Direct observation through verification of stakeholder roles and interactions based on interviews. Secondary data was obtained through document searches of institutional tasks and functions, institutional rules, and cooperation documents and regulations from each stakeholder.

Data analysis: The data analysis used in this research is a qualitative descriptive analysis using a stakeholder analysis instrument framework. This analysis is used to identify the stakeholders involved and analyze the role of stakeholders so that the influence and interests of stakeholders will be known as well as the relationship between stakeholders involved in strengthening farmer institutions (Reed *et al.*, 2009). Stakeholder mapping is differentiated according to the level of influence and importance in the institutional strengthening activities of maize farmers, which is assessed using the scoring method. The measurement of the level of influence and importance of stakeholders can be seen in Table 1.



Table 1. Measurement of stakeholders' level of influence and importance.

No	Element	Indicator	Score
Influence Level Assessment			
1	Strength of stakeholder conditions in farmer institutions	There is 4	5
		There is 3	4
		There is 2	3
		There is 1	2
		None	1
2	Strategic resource control (stakeholder eligibility conditions)	There is 4	5
		There is 3	4
		There is 2	3
		There is 1	2
		None	1
3	Stakeholder power in compensation	There is 4	5
		There is 3	4
		There is 2	3
		There is 1	2
		None	1
4	Organizational strength of stakeholders in strengthening farmers' institutions	There is 4	5
		There is 3	4
		There is 2	3
		There is 1	2
		None	1
5	Forms of stakeholder expertise (personality/individual conditions)	There is 4	5
		There is 3	4
		There is 2	3
		There is 1	2
		None	1
Level of Importance Assessment			
1	Stakeholder involvement in the farmer institutional strengthening program	There is 4	5
		There is 3	4
		There is 2	3
		There is 1	2
		None	1
2	Benefits of farmer institutional strengthening program for Stakeholders	Ada 4	5
		Ada 3	4
		Ada 2	3
		Ada 1	2
		Tidak ada	1
3	Stakeholder work programs for the development and sustainability of farmer institutions	There is 4	5
		There is 3	4
		There is 2	3
		There is 1	2
		None	1
4	Stakeholder authority in strengthening farmer institutions	There is 4	5
		There is 3	4
		There is 2	3
		There is 1	2
		None	1
5	The level of dependence of stakeholders in strengthening farmer institutions	There is 4	5
		There is 3	4
		There is 2	3
		There is 1	2
		None	1

The total score data of the influence and importance indicators were used to map stakeholders into four categories (Fig. 2).

- Subject: stakeholders with high importance but low influence
- Key Player: a stakeholder with high influence and importance
- Context Setter: Stakeholders with high influence but low importance.
- Crowd: Stakeholders with low influence and importance.

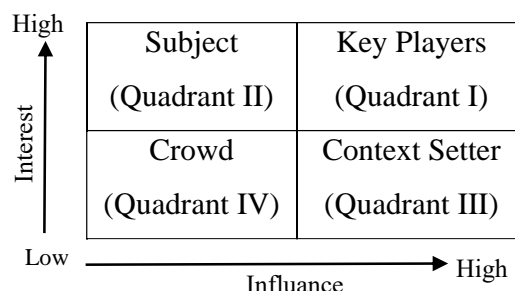


Figure 2. Interest-influence matrix.

Operational definition of research: Institutional strengthening referred to in this study refers to the specific aspects used to measure the institutional strengthening of maize farmers. The main aspects considered are the role of each actor in agricultural governance, the dissemination of agricultural information to farmers, the involvement of farmers in institutional decision-making, the availability of agricultural inputs (seeds, fertilizers, agricultural tools), cooperation between the public, voluntary, and private sectors in supporting farmers' institutions.

RESULTS

Identification of stakeholders: In the first phase of the study, all relevant stakeholders were identified using the stakeholder technique, which was created by Reed *et al.* (2009). Table 2 displays the results of the stakeholder identification process. Based on Table 2, the stakeholders involved in institutional strengthening of maize farmers are ten stakeholders from the Public Sector, seven stakeholders from the Voluntary Sector, and five stakeholders from the Private Sector. However, their roles differ from one another. The involvement of Public Sector Stakeholders is very important. The Regional House of Representatives, the Regional Development Planning Agency, and the Agriculture Office are important players due to their authority in formulating various policies and regulations for institutional strengthening of maize farmers. In addition, these stakeholders also play a role in supervising the implementation of several programs that have been established as well as providing policy direction, resource allocation, and technical assistance to farmers.

Stakeholders from the Voluntary Sector consist of organizations established by the community and organizations in the field of education. These stakeholders



contribute to sustainable agricultural development and empower farmers, and offer technical support, instruction, resource availability, and direction to farmers in implementing various government programs related to strengthening farmer institutions. Both central and local government programs.

Table 2. Identifying stakeholders that play a role in strengthening the institutionalization of maize farmers in Jeneponto Regency.

No.	Stakeholder	Classification
1	Agricultural extension center Village government	Public sector
2	Department of agriculture	
3	Department of food security	
4	Regional development planning agency (BAPPEDA)	
5	Department of public works and spatial planning (PUPR)	
6	Regional house of representatives (DPRD) Agricultural training center (BBPP)	
7	Center for Standardization of Agricultural Instruments (BSIP) Cereals	
8	Financial institution	
9		
10		
11	Non-government organizations	Voluntary sector
12	Village owned businesses	
13	University	
14	National outstanding farmer and fisherman association	
15	Self-help agricultural and rural training center	
16	PT. Jiva agriculture Indonesia	Private sector
17	PT. Bisi international Tbk	
18	Distributor of fertilizer	
19	Farmer's shop	
20	Collector traders	

Stakeholders from the Private Sector consist of entrepreneurs of production facilities and traders of agricultural products. These stakeholders can improve farmers' access to production facilities such as maize seeds, organic and chemical fertilizers, agricultural medicines and applicable technologies. In addition, the presence of these stakeholders makes it easier for farmers to market their crops.

The role of stakeholders in strengthening farmer institutions: The role of stakeholders in institutions is very important because they have an influence on sustainability, policies, and achievement of organizational or institutional goals. Some of the roles performed by stakeholders in supporting the institutional strengthening of maize farmers in Jeneponto District can be seen in Table 3.

Table 3. The role of stakeholders involved in institutional strengthening of maize farmers.

No.	Stakeholder	Role
1	Agricultural extension center	Provide counseling and training to farmers, assist with access to agricultural technology
2	Village government	Assist in farmer group administration and aid distribution
3	Department of agriculture	Develop agricultural policies and programs to strengthen farmer institutions, provide subsidies, support agricultural innovation
4	Department of food security	Develop food security policies, manage food barns and ensure regional food security
5	Regional development planning agency (BAPPEDA)	Designing agricultural sector development policies
6	Department of public works and spatial planning (PUPR)	Build and maintain agricultural irrigation infrastructure
7	Regional house of representatives (DPRD) Agricultural training	Overseeing the implementation of agricultural policies, setting regulations and budget allocations for agriculture
8	Agricultural training center (BBPP)	Organizing agricultural technical training for farmers and extension workers
9	Center for Standardization of Agricultural Instruments (BSIP) Cereals	Testing and ensuring the quality of agricultural seeds
10	Financial institution	Providing farm business credit for agricultural financing
11	Non-government organizations	Assist in advocacy and protection of farmers' rights
12	Village owned businesses	Providing business funds for agricultural development
13	University	Conduct research and innovation to improve agricultural yields
14	National outstanding farmer and fisherman association	Voice the aspirations of farmers, provide education to farmers
15	Self-help agricultural and rural training center	Provide agribusiness and farming skills training
16	PT. Jiva agriculture Indonesia	Provide agricultural production facilities and facilitate marketing of products through partnership schemes for farmers
17	PT. Bisi international Tbk	Providing superior seeds and partnership schemes
18	Distributor of fertilizer	Provide and distribute fertilizers
19	Farmer's shop	Provide agricultural needs for local farmers
20	Collector traders	Help farmers sell agricultural products



Public sector stakeholders must be involved. Through programmatic initiatives, regulatory changes, and policy interventions that promote the growth of agricultural industries, including maize, the government plays an important role in strengthening maize farmers' institutions. This includes the provision of agricultural infrastructure, technical support, subsidies for agricultural inputs, and assistance in facilitating market access. The government can empower maize producers, increase agricultural productivity, and help the economic growth of maize farming communities by implementing supportive policies and initiatives. The findings of this study are consistent with research conducted by Girei *et al.* (2018), which shows that policies and initiatives designed to assist small-scale maize farmers and improve their economic viability are formulated by the government. The government plays an important role in assisting farmers in increasing maize production by providing subsidized inputs, as evidenced by the results of Zulu *et al.* (2014).

Village-owned enterprises are economic institutions that play an important role in agribusiness development at the village level. Higher Education plays a role in improving the standard of living and welfare of the community through the application of science, technology and innovation, as needed. Community service programs implemented by universities are very relevant to the needs of farmers and can provide solutions to problems faced by farmers in farmer institutions. The National Outstanding Fishermen Farmers Association plays a role in conveying information, accelerating technological innovation, and assisting various government programs at the field level, assisting the government in implementing development programs in agriculture, plantations, and fisheries and helping to provide counseling and understanding to farmers. Some of the roles of the Agricultural and Rural Self-Help Training Center are improving knowledge and skills; disseminating and conveying agribusiness-based technology information; providing assistance in the application of technology; developing learning methods through demonstration methods (dem); assisting agricultural extension and developing leadership and facilitating the fulfillment of farmers' needs. Non-governmental organizations play an important role in strengthening farmer institutions to improve farmer productivity and welfare. Farmer empowerment is carried out through providing direction, guidance, technical support, and resources to implement various government programs related to the development of farmer institutions so that the involvement of stakeholders is needed in strengthening farmer institutions. This is in line with Basri *et al.* (2023) research which states that farmer institutions play a role in disseminating agricultural innovations, preparing farmers to face competitive markets, and encouraging cooperation between farmers, as well as facilitating effective technology adoption.

Private companies are companies engaged in trade, services, or industry. PT Jiva Agriculture Indonesia, PT Bisi International, fertilizer distributors, farmers' shops, and intermediary traders are the parties involved. Through various projects, partnerships, and programs aimed at improving agricultural productivity, sustainability, and economic growth in the maize farming sector, these stakeholders play an important role in supporting the institutional strengthening of maize farmers. Agricultural companies can play an important role in supporting the expansion and resilience of key smallholder institutions by leveraging their resources, experience, and networks. They can also lower the risks associated with farming businesses by offering agricultural technology, farm inputs, and maize marketing. These parties have the power to improve farmers' access to inputs, including chemical and organic fertilizers, maize seeds, farm inputs, and relevant technologies. In addition, farmers find it easier to market their crops when these stakeholders are present. This is in line with research Wei *et al.* (2021), which shows that agricultural businesses can help farmers by providing them with access to resources, technology, and training to improve farm efficiency and yields.

Level of stakeholder influence and importance: The results of the assessment of the level of influence and importance of stakeholders in institutional strengthening of maize farmers in Jeneponto District can be seen in Table 4.

Stakeholder mapping was conducted based on the level of influence and importance using scoring. The results of the analysis, stakeholders are grouped into four quadrants using a matrix according to according to (Reed *et al.*, 2009) can be seen in Figure 3.

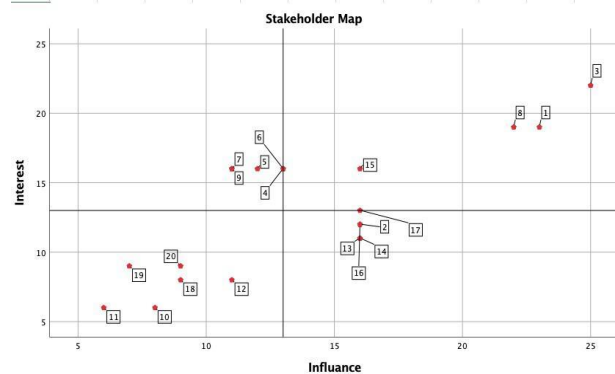


Figure 3. Stakeholder mapping matrix.

Each stakeholder has its own classification based on its level of influence and relevance in institutional strengthening of maize farmers in Jeneponto District, as shown by the stakeholder influence and importance matrix (Figure 3). Key players have high influence and importance in strengthening farmers' institutions, with the Department of Agriculture, the Agricultural Training Center, the Agricultural and Rural Independent Training Center, and the Agricultural Extension



Table 4. The results of the calculation of the value of the level of influence and interest of

No.	Stakeholder	Influence					Total	Interest					Total
		P1	P2	P3	P4	P5		K1	K2	K3	K4	K5	
1	Agricultural extension center	5	4	4	5	5	23	5	4	4	4	2	19
2	Village government	4	3	4	2	3	16	3	2	3	2	2	12
3	Department of agriculture	5	5	5	5	5	25	5	5	5	5	2	22
4	Department of food security	3	2	3	3	2	13	3	3	4	4	2	16
5	Regional development planning agency	3	2	3	2	2	12	5	4	4	2	1	16
6	Department of public works and spatial planning	3	3	1	4	3	14	3	4	4	3	2	16
7	Regional house of representatives	3	2	2	2	2	11	3	4	4	2	3	16
8	Agricultural training center	5	4	3	5	5	22	5	4	5	4	1	19
9	Center for Standardization of Agricultural Instruments (BSIP) Cereals	3	3	3	3	4	16	2	2	3	2	2	11
10	Financial institution	2	1	3	1	1	8	1	1	2	1	1	6
11	Non-government organizations	1	1	1	2	1	6	1	1	1	1	2	6
12	Village owned businesses	3	2	2	2	2	11	2	1	2	1	2	8
13	University	3	4	2	3	4	16	2	2	3	2	2	11
14	National outstanding farmer and fisherman association	4	4	2	3	3	16	3	3	4	3	3	16
15	Self-help agricultural and rural training center	4	3	1	4	4	16	3	4	4	2	3	16
16	PT. Jiva agriculture Indonesia	3	4	4	2	3	16	3	3	3	2	1	12
17	PT. Bisi international Tbk	3	4	3	3	3	16	3	3	3	2	2	13
18	Distributor of fertilizer	2	2	3	1	1	9	2	1	2	1	2	8
19	Farmer's shop	2	2	1	1	1	7	2	1	1	1	4	9
20	Collector traders	2	2	3	1	1	9	2	1	1	1	4	9

Description: P1 = strength condition; P2 = feasibility condition; P3 = compensation condition; P4 = organizational condition; P5 = individual condition. K1 = stakeholder involvement; K2 = program benefits; K3 = work program, K4 = form of authority, K5 = level of dependence

Center being the main stakeholder groups in building stronger agricultural institutions to support Indonesian agriculture. Subject group stakeholders play a role in policy formulation but have no direct influence. The Food Security Office, Development Planning Research and Development Agency, Public Works and Spatial Planning Office, DPRD, and BSIP Cereals are stakeholders in this subject group. The stakeholders included in Context Setters can influence decisions but are not directly involved in strengthening farmer institutions. Stakeholders in the context setter consist of the Village Government, Universities, the National Association of Outstanding Farmers and Fishermen, and PT Jiva Agriculture Indonesia, and PT Bisi International Tbk, based on the results of the stakeholder analysis. The classification of stakeholders who have little value and influence is called the crowd. The stakeholders included in the crowd group are known to be financial institutions, non-governmental organizations, village-owned enterprises, fertilizer distributors, farmers' shops, and traders, according to the results of the stakeholder study. These stakeholders still have little impact on the institutional improvement of maize farmers in Jeneponto District; their involvement is limited to meeting financial needs and facilitating coordination between farmer organizations.

DISCUSSION

Stakeholder mapping: This study categorizes stakeholders

based on two main dimensions: influence and interest in institutional strengthening of maize farmers in Jeneponto District which consists of four categories: key player, subject, context setter and crowd.

Key players: Because of their great power and importance to the success of a project, key players are the stakeholders most involved in management (Reed *et al.*, 2009).

The stakeholders included in these Key Players are the most important group because they have a significant influence on the success of management, according to Tampio *et al.* (2022) Improving the institutional capacity of farmers is one of the efforts of the local government in collaboration with the Department of Agriculture and the Agricultural Extension Center to improve agricultural institutions.

To effectively implement the work programs of the Ministry of Agriculture and the Jeneponto District Government, agricultural extension centers are needed to strengthen farmers' institutions. Agricultural extension officers remain important as they act as drivers and enablers for efforts to strengthen farmers' institutions. Rasanjali *et al.* (2021) highlighted that the training program significantly improved farmers' technological knowledge and crop production capabilities, underscoring the importance of continuing education and guidance in agriculture.

The Department of Agriculture is involved in the preparation of long- and medium-term development plans, as well as strategic plans, to improve the welfare and economy of the community through superior agricultural potential. Therefore,



the Local Government of Jeneponto District can influence the distribution of local budget by investing in agriculture. The authority to make rules and policies tailored to farmer institutions, along with cash resources obtained through budgeting, encourages the development of farmer institutions. Efforts to improve maize farmer institutions in Jeneponto District are greatly aided by the significant roles of these two stakeholders.

In accordance with its main tasks and functions, the stakeholders of the agricultural training center organize competency-based training activities in accordance with their roles and responsibilities. This is in accordance with MOA No. 37/Permentan/SM.120/8/2018 which states that training for farmers includes technical training on agricultural commodities as well as leadership and management training. The establishment of a self-help rural agricultural training center is one of the strategies to improve the ability of agricultural human resources (non-apparatus). In Jeneponto District, a self-help agricultural and rural training center is in Rumbia District. The self-help agricultural and rural training center is a smart and prosperous farmer who is expected to share expertise and technology with surrounding farmers to accelerate farmers' demand for the development of their human resource capacity through training and apprenticeship programs. The self-help agricultural and rural training center functions as a center for developing farmer business networks, organizing training and apprenticeship programs, providing farmer counseling and mentoring, developing, and strengthening farmer cadres, as well as developing and disseminating technology and innovations in agriculture, seeds, product processing, and regional development. According to Bertolozzi-Caredio *et al.* (2021) local based training can change the socio-economic dynamics of agricultural communities.

The goal of self-supporting agricultural and rural training centers is to help rural farmers become more independent and professionally competent. Marketing, technology, cultivation and management aspects are all included in mentoring efforts. Capacity building to plan, prepare materials, conduct, apply methodologies, assess, and implement additional advice, technology, and market development are the objectives of training development. The objective of cadre development is to create cadres of farmers in the countryside so that independent agricultural training institutions can cooperate with other educational institutions to increase the younger generation's understanding, enthusiasm and passion for agriculture. The purpose of extension is to produce independent agricultural extension workers who can empower farmer institutions, main actors, and/or business actors. Appropriate technology development Appropriate technology development aims to create technical progress in the context of farming business development. Promotion: the purpose of promotion is to increase technological information and expand commercial networks.

Subjects: Stakeholders who have high interests but little power over modern farmer institutions are the subjects. The Regional House of Representatives is tasked with overseeing local government policies that support the agricultural sector, especially those concerning the allocation of government aid and farmers receiving subsidized fertilizers. As a form of high attention to farmer institutions, the Jeneponto District Council passed the Jeneponto District Regulation No. 9/2019 on farmer institutions. The regulation serves as a guideline in supervising the implementation of farmer institutional development to assess the effectiveness and efficiency of the results of farmer institutional development in Jeneponto District.

The regional development planning agency plays an active role in identifying problems related to the farmer institutional strengthening program collected from all stakeholders (Pedersen *et al.*, 2022).

The cooperative relationship between Bappeda and other stakeholders can be seen from the coordination with all stakeholders in Focus Group Discussion meetings to formulate all problems related to institutional strengthening of maize farmers in Jeneponto District. Coordination with farmer organizations, farmer group associations, and organizations involved in the Jeneponto District food barn strengthening program is one of the work programs of the Food Security Office for institutional strengthening of maize farmers. The work program begins with the distribution and management of food barns, activity plans, and ways to increase food production in Jeneponto District through the processing of agricultural waste, the use of advanced agricultural technology, and the provision of skills training to farmers.

The Department of Public Works and Spatial Planning supports infrastructure development that ensures the availability of water for the horticultural and agricultural sectors. This is necessary to realize national food sovereignty. The Ministry of Development Planning Research and Development Agency's program, which includes the construction of dams, new irrigation, irrigation repair, and reservoirs for raw water supply, encourages the agricultural sector and food sovereignty. The government must continue to provide direction and empowerment to farming communities by providing socialization, job training, and empowerment to water user farmer associations, through Government Regulation of Public Works and Public Housing No. 12/PRT/M/2015 on Utilization and Maintenance of Irrigation Networks.

For farming communities, the Development Planning Research and Development Agency organizes coaching and empowerment programs to strengthen the capacity of water user farmers' associations in developing and managing irrigation networks, provides counseling to the community on the relationship of water user farmers' associations with relevant agencies, fosters participatory irrigation system



management, handles general and financial administration of water user farmers' associations, secures irrigation networks, agricultural mechanisms, and revives the involvement of water user farmers' associations in irrigation management. Based on its authority, the government should encourage the participation of farming communities in the project independently and cooperatively. It is expected that the guidance and empowerment program will enable the realization of a resilient and independent institutional framework, a sound and sustainable irrigation water development and management system, and the ability to increase agricultural yields and productivity to assist national food security efforts. Due to its limited role as a facilitator of agricultural agency programs, especially in the field of Agricultural Infrastructure and Facilities and the provision of irrigation needed by farmers, the Development Planning Research and Development Agency has less impact.

Research on cereal commodities is the focal point of Balitseral's research activities. The main objective is to create and develop technologies that can be used to improve the quality of cereals.

Context setters: The classification of stakeholders who have great influence, but low importance is called the context-setting group. The village head must issue an official decision on the inauguration of the farmer group before the village government approves the formation of the farmer group. Nonetheless, since farmers receive government assistance directly through field agricultural extension workers, the village government has little interest in agricultural organizations.

The National Outstanding Farmer-Fishermen Association stakeholder has a significant influence on farmers as it helps convey the aspirations of farmer groups to the central and local governments when policies are made to improve farmers' welfare. In addition, the National Outstanding Farmer-Fishermen Association is an institution that can assist in developing a competitive business scale and bargaining position. However, because not all aspirations conveyed by the National Outstanding Fishermen Farmers Association to the government have come true, and there has not been good cooperation between the National Outstanding Fishermen Farmers Association and agricultural extension workers in supporting and assisting farmers in the field, the contribution of the National Outstanding Fishermen Farmers Association to the progress of the agricultural sector in Jeneponto Regency has not been fully realized.

By discovering new technologies and implementing agricultural research ideas by lecturers and students, universities indirectly contribute to research and advocacy efforts that strengthen maize farmer institutions. However, stakeholders related to farmer institutions have not received research breakthroughs. The lack of research on innovations in the formation of farmer institutional strengthening is one of the factors that lead to the low position of universities.

Agribusiness companies PT Jiva Agriculture Indonesia, PT Bisi International Tbk assist farmers in Jeneponto District in terms of maize production and sales. PT. Jiva Agriculture Indonesia and PT. Bisi International Tbk establish partnerships with farmers. This is because the company provides loans for production facilities to farmers whose payments are made after the harvest; this is very beneficial for farmers who lack funds to grow crops. To further help farmers, the company also provides convenience in marketing the crops. The purchase price of maize is determined by the company based on the current market price. This is in accordance with the results of a study (Filimonau and Ermolaev, 2021) which showed that company partnerships with farmers can increase productivity and market access.

Crowd: As lenders, banks do not have much influence and power as they do not have the authority to implement initiatives aimed at improving institutional stability. To provide agricultural loans to farmer organizations, banks and the Ministry of Agriculture work together, which shows the interest of banks. However, some unique restrictions make it difficult for farmers to receive credit. As a result, the bank's function as a source of financing related to agricultural capital cannot function effectively.

Other parties such as non-governmental organizations, village-owned enterprises, fertilizer distributors, farm shops, and intermediary traders are also not authorized to undertake institutional strengthening initiatives. The types of village-owned enterprises in Jeneponto District include marketing, trading, savings and loans, clean drinking water management, and BRI-Link. Loans from village-owned enterprises are given to people who need money for trading and not for farming. Furthermore, village-owned enterprises can facilitate greater proximity and efficiency between local and village farmers by acting as fertilizer distributors or as farmer shops selling seeds and agricultural medicines. However, village-owned enterprises do not lend money to farmers to purchase inputs. Fertilizer distributors, farm shops, and agricultural product sellers perform similar tasks; their presence in the villages facilitates the acquisition of the necessary inputs by farmers. However, these stakeholders are not interested in and do not influence the institutional development program of maize farmers in Jeneponto District. Since non-governmental organizations have no power or interest in strengthening farmers' institutions, their stakeholders are largely invisible. This happens because non-governmental organizations only collect data from farmers who get government support to identify implementation weaknesses in farmer assistance programs. Research by Tamirat *et al.* (2023) revealed that the impact of NGOs in the agricultural sector is often limited due to lack of direct involvement in institutional programs.

Stakeholder collaboration. Institutional strengthening of maize farmers through stakeholder collaboration is essential to improve productivity, resilience, and sustainability in the



Table 5. Stakeholder collaboration in farmer institutions.

No.	Stakeholder	Collaboration	Benefit
1	Department of agriculture - Agricultural extension center - National outstanding farmer and fisherman association	Farmer counseling and mentoring	Improved farmer skills and agricultural technology adoption
2	Village Government - Village owned businesses - Farmers	Capital provision and farming business facilitation	Easier access to capital for smallholder farmers
3	Universities - Self-help agricultural and rural training center - Farmers	Training and research on agricultural innovations	Adoption of technology and increased agricultural productivity
4	PT. Jiva Agriculture - PT. Bisi - Fertilizer Distributor	Provision of production and marketing facilities	Easy access to fertilizers and superior seeds for farmers
5	Department of public works and spatial planning - Regional development planning agency - Village Government	Agricultural infrastructure management	Improved irrigation quality and access to agricultural roads
6	Regional house of representatives - Department of food security - Non-government organizations	Regulation and advocacy of agricultural policies	Protection of farmers' rights and fairer agricultural policies

agricultural sector. Effective collaboration between various stakeholders-including farmers, government agencies, research institutions, and private sector actors-can lead to improved resource management, knowledge sharing, and innovation, ultimately benefiting maize farmers and their communities. With good collaboration between stakeholders, the institutional strengthening program for maize farmers can run more effectively and have a positive impact on farmers' welfare. The forms and benefits of stakeholder collaboration can be seen in Table 5.

One of the main benefits of stakeholder collaboration is the increase in farmer productivity through extension activities to improve farmer skills and the adoption of agricultural technology. Farmer groups serve as an extension medium, focusing on improving agricultural activities and productivity (Mardi *et al.*, 2023). By involving farmers in decision-making, institutions can ensure that the strategies implemented are relevant and beneficial to the specific needs of the farming community. This is in line with research results of Nurliza *et al.* (2020) who emphasized the need for collaboration between farmers, extension services, researchers, and policy makers to empower smallholder farmers. This collaborative approach can lead to the dissemination of best practices and technologies that increase maize production, thereby improving farmers' economic and social conditions.

The establishment of strong networks among stakeholders is essential to improve the efficiency of the maize supply chain. Zuhri *et al.* (2023) highlighted the importance of understanding marketing channel efficiency and institutional performance in the maize supply chain, indicating that effective collaboration can result in increased income for farmers. By working together, stakeholders can identify bottlenecks in the supply chain and develop strategies to improve market access and profitability for maize farmers.

Overcoming the challenges faced by maize farmers requires coordinated efforts from all stakeholders involved in the agricultural sector. Abdul-Rahaman and Abdulai (2022) identified several constraints in maize farming, such as limited fertilizer supply and price fluctuations. Collaborative

efforts among stakeholders can facilitate the implementation of this policy, leading to increased income for smallholder farmers.

Policy implications of institutional strengthening: The implications of policies aimed at strengthening maize farmers' institutions are crucial to improving agricultural productivity, sustainability, and overall viability of maize farming. These policies can facilitate better collaboration among stakeholders, improve resource management, and encourage innovation, ultimately benefiting maize farmers and their communities. The findings of this study have important policy implications (Table 6).

One of the main implications of institutional strengthening of maize farmers is increased economic resilience through improved income generation.) found that larger farms with more assets tend to generate significantly higher income from maize production compared to smaller farms. This suggests that policies should focus on supporting the growth of farmer institutions that can help smallholder farmers scale up their operations, thereby increasing their income and economic stability. By providing access to resources, training, and financial support, policies can enable farmers to achieve economies of scale, which is crucial for increasing their competitiveness in the market.

In addition, the establishment of public-private-community partnerships (PPCPs) can significantly improve food security and support maize farmers. Shoniwa (2023) discussed how multi-stakeholder collaboration can strengthen food value chains and improve access to resources for farmers. Policies that facilitate the formation of PPCPs can ensure that farmers receive the necessary support and resources to thrive in a competitive agricultural landscape.

Policies should focus on building the capacity of farmer organizations and cooperatives. Shiferaw *et al.* (2011) argued that good governance, transparency, and market orientation are critical to improving access to markets through producer organizations. By prioritizing agribusiness opportunities and providing support for the development of economically viable cooperatives, policymakers can empower maize farmers to increase their market presence and profitability.



Table 6. Policy implications based on research results.

No.	Research results	Policy implication
1	Lack of coordination among stakeholders	Establishment of regular communication forums between relevant agencies, village governments, and the private sector.
2	Limited access to information for farmers	Development of digital platforms and mobile applications for extension and market information.
3	Limited access to capital for smallholders	Simplification of access procedures for People's Business Credit (KUR) and alternative financing schemes through BUMDes.
4	Low adoption of modern agricultural technology	Increased training and demonstration of agricultural technology through universities and Self-help agricultural and rural training center
5	Lack of certainty in the selling price of crops	Establishment of a basic price policy to protect farmers from market fluctuations.
6	Inadequate agricultural infrastructure	Increased local budgets for irrigation development and maintenance as well as road access to production centers.
7	Imbalance in partnerships with the private sector	Formulation of regulations that ensure a fairer and more transparent partnership system for farmers.
8	Lack of supervision of subsidized fertilizer distribution	Strengthening the monitoring and evaluation mechanism of fertilizer distribution to make it more transparent and efficient.
9	Suboptimal role of village government in supporting farmer groups	Capacity building of village officials in managing farmer group administration and aid distribution.
10	Lack of private sector participation in agricultural development	Incentivize companies that invest in training and agricultural technology for local farmers.

The integration of technology and innovation in farming practices can significantly improve the efficiency of maize farming. Adamashvili *et al.* (2020) highlighted that access to enabling technologies and effective communication between farmers, researchers, and policymakers are critical for agricultural development. Policies should encourage the adoption of innovative technologies and practices that can improve productivity and sustainability in maize farming. Overcoming barriers to collaboration between stakeholders is critical to strengthening maize farmer institutions. Chinseu *et al.* (2022) emphasized the need for effective collaboration among conservation agriculture promoters to achieve institutional learning and socioeconomic development. Policies should aim to create platforms for dialogue and collaboration among various stakeholders, ensuring that resources and experiences are shared effectively.

Conclusion: This study identified and mapped 20 stakeholders involved in institutional strengthening of maize

farmers in Jeneponto District, consisting of the public, voluntary, and private sectors. Stakeholders with the highest influence and importance, such as the Agricultural Extension Center, Department of Agriculture Office, and the Center for Agricultural and Rural Self-Help Training, have a strategic role in strengthening farmers' institutional capacity. Meanwhile, other stakeholders play a supporting role through the provision of production facilities, financing services, and market development. Close collaboration between stakeholders is needed to increase the productivity and sustainability of the agricultural system. Strengthening farmer institutions can be achieved through the development of learning networks, intensive mentoring, and policy integration that supports the role of each stakeholder. Policy recommendations include improving synergies between institutions, providing sustainable training programs, and strengthening linkages between farmers and the private sector to improve market access.

Authors contributions statement: Rasdiana Mudatsir; conceptualization, formal analysis, methodology, data curation, resources, and writing - original draft, Sitti Bulkis; conceptualization, and supervision, Muhammad Hatta Jamil; conceptualization, data curation, supervision, writing - review & editing, Rahmadanih; conceptualization, and supervision.

Conflict of interest: the authors declare no conflict of interest.

Acknowledgments: the authors would like to thank the farmers and agricultural extension workers for their willingness to share information and participate in the survey. We would also like to thank the promoter and co-promoter who accompanied the authors from the beginning to the end of this study.

Ethical statement: This article does not contain any studies related to ethical issues.

Availability of data and material: All data is presented in this publication.

Informed consent: Written consent was obtained from all participants to publish this data.

Consent for publication: All authors submitted consent to publish this research article in JGIAS

SDGs addressed: No poverty, Responsible Consumption and Production, Zero Hunger

REFERENCE

Abdul-Rahaman, A. and A. Abdulai. 2022. Mobile money adoption, input use, and farm output among smallholder rice farmers in Ghana. *Agribusiness* 38:236-255.
 Adamashvili, N., M. Fiore, F. Contò and P. Sala. 2020. ecosystem for successful agriculture. *Collaborative*



- Approach as a Driver for Agricultural Development. *European Countryside* 12:242-256.
- Arsyad, M., A. Nuddin, M. Fahmid, S. Darmawan, D. Aries, T. Pulubuhu, A.A. Unde, A. Rasyid and A. Amiruddin. 2021. Linkage of roles between institutions for agricultural development in Indonesian border area. *Agroland* 28:1-16.
- Banda, G. 2022. Evolution of Zimbabwe's maize innovation ecosystems: building an institutional innovation infrastructure that supported food security. *Africa Development* 47:167-195.
- Basri, Z., S. Bulkis, M. Arsyad and M.F. Bdr. 2023. Identifying agribusiness institutions and their role in increasing cocoa production: evidence from Polewali mandar, Indonesia. *International Journal of Sustainable Development and Planning* 18:53-59.
- Bertolozzi-Caredio, D., I. Bardajf, A. Garrido, R. Berry, J. Bijttebier, C. Gavrilesco, H. Harizanova, B. Jendrzewski, M.M.P. Meuwissen, F. Ollendorf, C. Pinsard, J. Rommel, S. Severini and B. Soriano. 2021. Stakeholder perspectives to improve risk management in European farming systems. *Journal of Rural Studies* 84:147-161.
- Chinseu, E.L., A.J. Dougill and L.C. Stringer. 2022. Strengthening conservation agriculture innovation systems in sub-Saharan Africa: lessons from a stakeholder analysis. *International Journal of Agricultural Sustainability* 20:17-30.
- Di Iacovo, F., R. Moruzzo and C.M. Rossignoli. 2017. Collaboration, knowledge and innovation toward a welfare society: the case of the Board of Social Farming in Valdera (Tuscany), Italy. *Journal of Agricultural Education and Extension* 23:289-311.
- Dlangalala, S.F. and M. Mudhara. 2020. Determinants of farmer awareness of water governance across gender dimensions in smallholder irrigation schemes in kwazulu-natal province, South Africa. *Water SA* 46: 234-241.
- Girei, A.A., N.D. Saingbe, S.B. Ohen and K.O. Umar. 2018. Economics of small-scale maize production in Toto local government area, Nasarawa state, Nigeria. *Agrosearch* 18:90-104.
- Irsan, L.M., R. Musyawah and A. Ati. 2020. Estimation of corn production (*Zea Mays L.*) using spatial ecology approach in Jeneponto Regency. *Jambura Geoscience Review* 2:69-77.
- Katchova, A.L. and A.C. Sant'Anna. 2019. Impact of ethanol plant location on corn revenues for U.S. farmers. *Sustainability* 11:6512.
- Latifa, D., Y. Karmaita, Yefriwati, Agustamar, and Yubniati. 2023. Financial analysis of corn farming on the post-gold mine land reclamation technology package in Palaluar Nagari Sijunjung Regency pp. 012060. *IOP Conference Series: Earth and Environmental Science*.
- Managanta, A., A. Sumardjo, D. Sadono, P. Tjitropranoto. 2019. Factors influencing the competence of cocoa farmers in central Sulawesi Province. *Extension Journal* 15:120-133.
- Mardi, Z., S. Hasibuan and A. Rafiki. 2023. Factors affecting the improvement of the economic status of corn farmers (case study of corn farmers in Suka Damai Village, Lawe Sigala-Gala District, Southeast District). *Journal of Social Research* 2:3183-3195.
- Musadar, and Z. Abidin. 2020. Perception analysis and factors affecting the consumption of local food from corn in Kendari city p. 012138. *IOP Conference Series: Earth and Environmental Science*.
- Nalumu, D.J., H. Mensah, O. Amponsah and S.A. Takyi. 2021. Stakeholder collaboration and irrigation practices in Ghana: issues, challenges, and the way forward. *SN Applied Sciences* 3:576
- Niyazmetov, D., I. Soliev and I. Theesfeld. 2021. Ordered to volunteer? Institutional compatibility assessment of establishing agricultural cooperatives in Uzbekistan p. 105538. *Land Use Policy*.
- Nurliza, A. Ruliyansyah and R. Hazriani. 2020. Performance behavior of corn smallholders for sustainable cooperative change in west Kalimantan. *Agraris* 6:1-11.
- Pedersen, I., L. Ellingsen-Dalskau and G. Patil. 2022. Characteristics of farm-based day care services for people with dementia - mapping the stakeholders' views. *Space and Society* 3:100073.
- Rahayu, H.S.P., Saidah, Risna, A. Nirma Wahyuni and Y. Purna Raharjo. 2022. Preference level for glutinous corn and sweet corn as local food in Sigi regency p. 01017. *E3S Web of Conferences* 361.
- Rasanjali, W.M.C., R.D.M.K.K. Wimalachandra and S.H.P. Malkanthi. 2021. Impact of agricultural training on farmers' technological knowledge and crop production in Bandara Wela agricultural zone. In *Applied Economics and Business* 5:37-50.
- Reed, M.S., A. Graves, N. Dandy, H. Posthumus, K. Hubacek, J. Morris, C. Prell, C.H. Quinn and L.C. Stringer. 2009. Who's in and why? A typology of stakeholder analysis methods for natural resource management. *Journal of Environmental Management* 90:1933-1949.
- Rustinsyah, R. 2019. The significance of social relations in rural development: A case study of a beef-cattle farmer group in Indonesia. *Journal of Co-Operative Organization and Management* 7:100088.
- Rwamigisa, P.B., R. Birner, M.N. Mangheni and A. Semana. 2018. How to promote institutional reforms in the agricultural sector? A case study of Uganda's National Agricultural Advisory Services (NAADS). *Development Policy Review* 36:607-627.
- Sariati, I. and D. Hayanti. 2023. Transformation of farmer institutions into farmer economic institutions as an



- agribusiness Development Acceleration Model. *Jurnal Suluh Tani* 1:28-34.
- Sasmi, M., A. Agustar, I.W. Syarfi and Hasnah. 2023. Empowerment of farmer institutions in improving farmer's bargaining position p. 012001. IOP Conference Series: Earth and Environmental Science.
- Schwilch, G., F. Bachmann and J. de Graaff, 2012. Decision support for selecting SLM technologies with stakeholders. *Applied Geography* 34:86-98.
- Shiferaw, B., J. Hellin and G. Muricho, 2011. Improving market access and agricultural productivity growth in Africa: What role for producer organizations and collective action institutions? *Food Security* 3:475-489.
- Shoniwa, B. 2022. Public-private-community partnerships (PPCPs) as a mechanism in enhancing food security during the COVID-19 pandemic in Zimbabwe. *Public Administration and Policy* 26:199-212.
- Stupak, N. 2016. Impact of agricultural transition on soil protection in Ukraine: the role of institutional change. *Land Use Policy* 55:86-97.
- Tampio, K.P., H. Haapasalo and F. Ali. 2022. Stakeholder analysis and landscape in a hospital project - elements and implications for value creation. *International Journal of Managing Projects in Business* 15:48-76.
- Tseganesh, W.T., S.M. Pedersen, J.E. Ørum, and S.H. Holm. 2023. Multi-stakeholder perspectives on field crop robots: lessons from four case areas in Europe, *Smart Agricultural Technology* 4:100143.
- Tuna, E., A. Martinovska Stojcheska, I. Janeska Stamenkovska and A. Simonovska. 2019. Networks in the macedonian organic production context. *Journal of Agricultural, Food and Environmental Sciences* 73:47-56.
- Uphoff, N. 1992. Local institutions and participation for sustainable development a farmer-centered approach to sustainable development: building equity through rural co-operatives with the system of rice intensification view project understanding contributions of beneficial microorganisms to the performance of rice and other crops under SRI/SCI management; synthesis of knowledge and experience with system of crop intensification view project pp. 14.
- Viachaslau F., Vladimir and A. Ermolaev 2021. A sleeping giant? food waste in the foodservice sector of Russia. *Journal of Cleaner Production* 297:126705.
- Wei, Y., F. Zhong, X. Luo, P. Wang and X. Song. 2021. Ways to improve the productivity of oasis agriculture: Increasing the scale of household production and human capital? a case study on seed maize production in Northwest China. *Agriculture* 11:1218.
- Zuhri, N.M., E.S. Rahayu, K. Kusnandar and M. Harisudin. 2023. Corn supply chain in central java province: marketing channel efficiency and Chain institutional performance approach. *Journal of International Conference Proceedings* 6:165-181.
- Zulu, P., T. Kalinda and G. Tembo. 2014. Effects of the maize input subsidy program on groundnuts production in Zambia. *Journal of Agricultural Science* 6:253-264.

