

LITERATURE REVIEW: THE ROLE OF AGRICULTURAL INSTITUTIONS IN SUPPORTING FOOD SECURITY AND SUSTAINABLE AGRICULTURAL DEVELOPMENT

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ABSTRACT

National food supplies alone do not necessarily ensure food security at the regional, household, or individual levels. Agricultural institutions play a crucial role in supporting national food security. This study aims to analyze the role of agricultural institutions in promoting food security and sustainable agricultural development, as well as to identify strategies for strengthening these institutions to achieve optimal food security. A Systematic Literature Review (SLR) method with a qualitative approach was employed for this study. The process of journal selection was conducted using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework, which includes stages such as identification, screening, eligibility, and inclusion. The search was carried out using Google Scholar and Scopus. The inclusion criteria for the literature sources were: (1) relevance to the research topic, (2) publication within the past five years (2021–2025), and (3) high credibility. The findings of the study indicate that agricultural institutions play a vital role in supporting food security and sustainable agricultural development. The success of agricultural development heavily depends on institutional strength at both the local and national levels. Consequently, strategies to strengthen agricultural institutions, which involve multiple sectors and encourage active participation from farmers, are essential. Institutional innovation, government support, and the development of human resource capacity within institutions are key to achieving optimal food security across regions.

Keywords: Agricultural Institutions; Food Security; Institutional Strengthening; Supporting; Sustainable Agricultural Development

1 Introduction

Agriculture plays a crucial role in the economic development of a country, particularly in Indonesia. This sector not only contributes to increasing the income of the population but also generates employment opportunities and supports food security [1] [2]. Effective food security management extends beyond safeguarding the well-being of households; it also has significant implications for social resilience, economic stability, political stability, and national security [3]. On a national scale, food security refers to a country's ability to ensure that all its citizens have access to an adequate supply of food that is not only sufficient in quantity and decent in quality but also safe and halal, achieved through optimal utilization of domestic resources and diversity [4].

Food security has emerged as a key issue within the framework of national development [5]. However, the availability of adequate food supplies at the national level does not necessarily guarantee food security at the regional, household, or individual levels [6]. Achieving sustainable food security, as a means of ensuring sufficient food for communities, requires innovation in agricultural institutions [7]. Both formal and informal agricultural institutions play a vital role in facilitating efforts to achieve food self-sufficiency [1] [8].

Agricultural institutions play a crucial role in supporting national food security [9]. These institutions represent a key subsector to consider when evaluating the potential for developing agricultural regions [10]. Farmer-level institutions are organizations that are established by, for, and from farmers, with the primary function of advocating for farmers' interests. These include associations, agricultural commodity boards, and farmer group associations, as well as farmer groups. Given their significant role in advancing agricultural development, it is essential to ensure that these institutions receive proper attention and management, enabling them to function effectively and fulfill their objectives [11].

The role of agricultural institutions in promoting the effective functioning of the agribusiness system is essential. However, their participation is often seen as suboptimal, particularly in relation to the farming system, which involves numerous stakeholders in its implementation. One key aspect that needs to be fostered at the farm level is group awareness, which should emerge based on necessity. As agricultural institutions evolve, they must be directed toward becoming economic institutions aimed at enhancing economies of scale, improving business efficiency, and strengthening farmers' positions

and bargaining power [12]. A significant challenge faced by farmers is the lack of capital, alongside the need for supporting factors such as adequate infrastructure, extension services, and favorable government policies. These elements are crucial to support farming activities and improve farmers' access to markets. The objectives of this research are to analyze the role of agricultural institutions in supporting food security and sustainable agricultural development, as well as to identify strategies for strengthening these institutions to achieve optimal food security.

2 Research method

This research employs the Systematic Literature Review (SLR) method with a qualitative approach. The SLR is a technique for synthesizing scientific evidence in a transparent and replicable manner to address specific research questions, while striving to include all relevant published evidence on the topic and assess its quality [13]. The journal selection process for this review was conducted using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) diagram. PRISMA provides a set of evidence-based minimum criteria for reporting systematic reviews and meta-analyses [14]. The PRISMA procedure involves several stages: identification, screening, eligibility assessment, and inclusion, as illustrated in Figure 1.

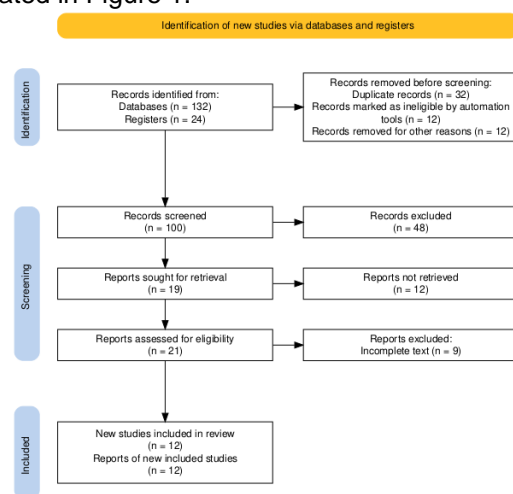


Fig 1. Journal search process

The researchers utilized Google Scholar and Scopus for the search process, using the keywords 'agriculture,' 'agricultural institutions,' and 'food security.' The criteria for the literature sources included in this study were: (1) relevance to the research topic; (2) publication within the last five years, specifically from 2021 to 2025; and (3) high credibility. Through journal searches on Google Scholar and Scopus, the researchers identified 156 relevant journals published between 2021 and 2025. Of these, 132 journals were found on Google Scholar and 24 on Scopus. During the screening and assessment process, 135 journals were excluded for not meeting the established criteria, leaving 21 journals that satisfied the requirements. However, only 12 of these 21 journals were available in full text, while the remaining 9 journals were inaccessible in full text.

3 Results and discussion

Journal Results

Nu mb er	Title/ Year	Research her	Objective	Population / Sample	Research methods	Results
1	Institutional Capacity Building in Supporting Food Security Jeneponto	Rasdian a Mudatsir dan Asriyanti Syarif	1) To examine the role of agricultural institutions in supporting the National	This study involved 10 informants, including managers and members of	SWOT analysis is employed to develop strategies for institutional strengthening	The key actors involved in the development of the food security system in Jeneponto Regency include farmers who are members of farmer groups, the Department of Agriculture, the Agricultural Extension

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	Regency (2023)		Food Security Program in Jeneponto Regency; 2) To identify the strategies required to strengthen farmer institutions in support of the Food Security Program in Jeneponto Regency	farmer groups, agricultural extension workers, and representatives of supporting institutions in Turatea District. Purposive sampling was employed to select the informants for this study.		Center, and local traders. To strengthen farmer institutions and enhance food security in the region, several strategies should be implemented. These include improving the administrative practices within farmer groups, fostering greater farmer participation in extension activities, and encouraging more active engagement with field agricultural extension workers. Furthermore, it is essential to enhance the government's role in establishing economic institutions for farmers. The establishment of independent agricultural extension workers, the promotion of modern technology by farmer groups to add value to agricultural products, and improving the bargaining power of farmers within the agricultural product trade system are also crucial steps in this process.
2	Effect of Agricultural Investment on Food Security in sub-Saharan Africa: What Role Does Institution Play? (2021)	Tolulope Temilola Osinubi, Olumuyiwa Tolulope Apanisile	This study aims to evaluate the effect of agricultural investment and institution on food security in 24 Sub-Saharan African (SSA) countries between.	Furthermore, the paper employs panel data of 24 SSA countries	Literature Review	The study concludes that investment in agriculture and institutional quality have significant roles to play in ensuring food security in the selected countries. Thus, the study suggests further investment in the agricultural sector to boost agricultural food production, thereby ensuring food security in the selected African countries.
3	Strengthening Local Institutions in The Development Of Horticultural Agribusiness In Uluere District, Bantaeng Regency (2022)	Akbar, Asriyanti Syarif, Muh. Ikmal Saleh, Jumiati	1). The identification of local institutions in the development of horticultural agribusiness in Bantaeng Regency, 2). Knowing the strategy of institutional strengthening	This study involved 10 informants, including agricultural extension workers, village heads, and heads of farmer groups in Uluere District	Qualitative descriptive	Local institutions that support the development of horticultural agribusiness include public sector organizations such as the BP3K, Food Security Agency, agricultural extension workers, and the Department of Agriculture. Voluntary sector institutions consist of farmer groups, women farmer groups, farmer group associations, village unit cooperatives, and farmer cooperatives. Private sector institutions include retail

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			in the development of horticultural agribusiness in Bantaeng Regency			kiosks and joint business groups. Strategies to strengthen local agribusiness institutions should include continuous enhancement of human resources within these institutions, as well as the involvement of young farmers in the management structure. Additionally, training in digital-based institutional administration, fostering greater collaboration with financial institutions, and maximizing government support are crucial. It is also essential to optimize the roles and functions of both institutions and their administrators, raise institutional awareness among all members, and improve services for both group members and consumers.
4	Identification Of Agricultural Institutions As Supporting Systems In Agricultural Agribusinesses In Sukabumi District (2023).	Ema Hilma Meilani, Endang Tri Astutinin, Reny Sukmawani, Amalia Nur Milla	This research aims to identify institution as a role of supporting in upstream, on farm and downstream of agribusiness sub system	Secondary data was obtained from related agencies	Qualitative descriptive	Agricultural institutions in Sukabumi District include educational institutions, social organizations, economic institutions, and information service entities. These institutions are represented through farmer groups, farmer associations, cooperatives or other financial organizations, and the Agricultural Extension Centers (BPP), all of which work to meet the needs of farmers.
5	Innovations in Agricultural Institutions for Achieving Food Security (2023)	Yennita Sihombing	To assess the extent of agricultural institutional innovation in achieving food security, thereby enabling the development of strategies for optimizing institutional contributions to food security	Several references derived from research findings, studies, and reviews of various publications were subsequently synthesized into a scientific paper	Qualitative descriptive	Agricultural institutions, including farmer organizations, play a critical role in determining the success of future agricultural development and in assisting the government and other stakeholders in supporting farmers. These institutions are essential for the adoption of sustainable technological innovations in agricultural development. Key factors influencing farmer institutions include government support, active participation of member farmers, the human resource capabilities of the

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						institutions, their economic strength, management practices, the socio-cultural context of farming communities, and the availability of institutional facilities and infrastructure. To establish optimal food security, an innovative agricultural institutional strategy is necessary to ensure the realization of food security goals.
6	Food security outcomes in agricultural systems models: Current status and recommended improvements (2021)	Charles F. Nicholson, Emma C. Stephens, Birgit Kopainsky, Andrew D. Jones, David Parsons, James Garrett	Knowing how food security has been conceptualized and evaluated in agricultural systems has not been systematically evaluated.	We assigned each of the 91 papers to one of four categories.	Qualitative descriptive	First, representation of food security often is not consistent with those indicators viewed as more appropriate by human nutritionists. Second, to represent food access, a greater focus on food consumption expenditures, experiential food insecurity scales and measures of dietary diversity would be appropriate. Third, much greater attention should be paid to the stability dimension of food security.
7	The potential of agricultural institutions in supporting agricultural development across the seven districts of Sukabumi (2024)	Reny Sukmawani, Endang Tri Astutinin, Eliesa Zahra Septiani, Neng Elmi Salehah	Identifying the potential of agricultural institutions, with the aim of enabling Sukabumi Regency to optimize these institutions' capabilities in enhancing agricultural development	The study area encompasses seven districts in Sukabumi Regency, including Tegalbuled, Cidadap, Cidolog, Curugkembang, Sagaranten, and Pabuaran	A qualitative research approach with a descriptive data presentation	The agricultural institutions identified in Region Seven of Sukabumi Regency consist of four main categories: farmer institutions, which include farmer groups, farmer group associations (gapoktan), and farmer commodity associations; financial institutions, such as banks and cooperatives; extension institutions, including the Agricultural Extension Center (BPP), UPTD Agriculture, and UPTD Livestock; and marketing institutions, which are still managed on an individual or small-scale basis.
8	Identification of Agricultural Institution and Its Role in Production Subsystem	Mariyah, Rita Mariati, Eko Harri Yulianto, Arifin, Adinda	This research aims to identify existing agricultural institutions in Bukit Pariaman	The sampling method was purposive sampling with 7 farmer group	Quantitative	The research results showed that agricultural institutions in Bukit Pariaman Village number 53 farmer groups with 67.92% in the beginner class. The role in the production subsystem was demonstrated by the achievement of a rice

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	of Lowland Paddy in Bukit Pariaman Village Tenggara Seberang District, 2024	Rizky Khairani	Village, identify the role of farming institutions in the rice farming production subsystem, and analyze farmers' access to existing agricultural institutions in Bukit Pariaman Village	leaders as respondents		production surplus of 88.78%. Farmers' perceptions of access are in the high category, with a score of 21.14, where access to credit institutions is still limited.
9	The Role Of Agricultural Institutions On The Adoption Of Modern Technology Of Rice Farmers In Bone District (Case Study of Rice Farmers in Ujung Tanah Village, Mare District), 2024	Jusnaeni, Suardi Bakri, A. Susilawaty Hardiani	This study aims to analyze the role of agricultural institutions on the adoption of modern technology among rice farmers in Ujung Tanah Village, Mare Subdistrict, Bone Regency	The population and sample of this study consisted of rice farmers in Ujung Tanah Village. Samples were randomly selected from existing farmer groups, with a total of 100 respondents	This study employs a descriptive approach combining both quantitative and qualitative methods	<p>Role of Agricultural Institutions: Farmer groups in Ujung Tanah Village have demonstrated high effectiveness in managing rice farming innovations, with 78% of respondents recognizing these groups as a valuable source of education. However, their roles in facilitation and evaluation remain relatively low, at 59% and 54%, respectively. This suggests the need for increased institutional support to enhance these functions.</p> <p>Innovation Development Process: The development process of rice farming innovations in this village reveals that although many farmers have adopted new technologies, some have discontinued their use at an early stage due to concerns over potential advantages and disadvantages. This highlights the importance of improving farmers' understanding of the benefits and risks associated with these technologies.</p>
10	Identification of the Role and Strategies for the Development of	Lukmanul Hakim, Tintin Febrianti	This research aims to identify the existence, role and development strategy in	The sample for this study consisted of 30 farmers and palm	Descriptive quantitative method	The Arum Gula Association is a farmer institution that aims to increase the independence and empowerment of palm sugar farmers. With a bottom-up leadership system, the Arum Gula Association has

Nu mb er	Title/ Year	Research er	Objective	Population / Sample	Research methods	Results
	Agricultural Institutions within the Arum Gula Association in Bungbulang District., 2025		the institution of the Arum Gula Association.	sap processors.		succeeded in strengthening the participation of its members in social, economic and environmental aspects. The role of the Association includes the provision of capital tools, market guarantees, and training that improve the social, economic, and productivity of farmers.
11	Agricultural Institutional Support for Millennial Farmers in The Era of Smart Farming Disruption (Study of the Sustainability Agricultural Development in Central Java Province), 2024	Lutfan Makmun, Daniel Daud Kameo, Lasmono Tri Sunaryanto, Widadah Mubarakah	1) analyzing agricultural institutional support for millennial farmers in the era of smart farming disruption; 2) develop recommendations for improving agricultural institutional support for sustainable agricultural development in the era of smart agricultural disruption	The research sample consisted of millennial farmers aged 17 to 39 years from 10 districts/cities in Central Java Province, totaling 216 participants. Purposive sampling was used to select the sample	Metode/ prosedur survei berpendekatan kuantitatif, didukung oleh data kualitatif explanatori	Institutional support for agricultural farmers (X2) received an average score of 2.74, which falls within the 'not yet good' category. The sustainability of agriculture, encompassing economic sustainability (Z1), social sustainability (Z2), and environmental resilience (Z3), has an average score of 2.74, placing it in the 'low sustainability' category
12	Farmer Groups Strengthening Strategy of Agroforestry Farming: The Case of Farmer Groups in Sodonghilir District - Tasikmalaya, 2021	Idin Saepudin Ruhimat	To analyze strategic factors, evaluate various strategic alternatives, and provide prioritized recommendations for strengthening farmer groups in the development of agroforestry farming enterprises	The research sample comprised 30 participants, including farmer group administrators, community leaders, extension workers, village and sub-district government officials, traders, and representatives from other	Analisis SWOT dan Quantitative Strategic Planning Matrix (QSPM).	There are two strategic factors that must be considered when strengthening farmer groups in developing agroforestry farming businesses: internal and external factors. Internal factors include the strengths and weaknesses of the group, while external factors encompass the opportunities available for utilization and the threats that farmer groups must confront.

Nu mb er	Title/ Year	Researc her	Objective	Population / Sample	Research methods	Results
				relevant institutions/ agencies.		

Discussion

Overall, the study employed both descriptive qualitative and quantitative approaches for data analysis. The research utilized purposive sampling techniques to select informants or samples that were directly relevant to the research topic, including farmer groups, agricultural extension workers, and other stakeholders. Additionally, some articles incorporated SWOT analysis to develop strategies, while survey methods were used to gather quantitative data that would facilitate further analysis. The primary focus of this study is on identifying and analyzing agricultural institutions, as well as developing strategies for institutional growth and strengthening, to enhance food security and support agribusiness development across various regions.

After analyzing 12 articles, the researchers concluded that farmer institutions play a crucial role in ensuring food security. They identified several strategies that should be implemented to strengthen these institutions, including improving the management of farmer groups, enhancing farmers' participation in extension services, and reinforcing the government's role in establishing economic institutions for farmers. SWOT analysis was employed to formulate strategies aimed at institutional strengthening. The findings of this study highlight the essential role of farmer groups and extension workers in maintaining the long-term sustainability of regional food security [5]. Furthermore, investment in the agricultural sector and the quality of institutions are key factors in achieving food security. As a result, the study advocates for increased investment in agriculture to boost food production, which in turn will help secure food supply in the region. This research underscores the importance of institutional quality in supporting global food security, particularly in developing nations [15]. "The research aimed to identify local institutions that contribute to the development of horticultural agribusiness in Bantaeng Regency. The identified institutions span across various sectors, including public institutions (such as BP3K and the Agriculture Office), voluntary sector institutions (farmer groups and cooperatives), and private sector entities (retail kiosks and joint business groups). The researchers proposed several strategies to strengthen these local institutions, including digital-based human resource training, enhanced collaboration with financial institutions, and raising member awareness. These strategies highlight the critical role of robust institutions in accelerating agribusiness development [16]. The institutions involved in agricultural agribusiness include those from the educational, social, economic, and information service sectors. The findings indicate that all of these institutions are integral in meeting the needs of farmers, particularly in production and marketing. The researchers emphasize the necessity of institutional strengthening to ensure the success of future agricultural development [17].

Additionally, other studies have explored the role of innovations within agricultural institutions in achieving optimal food security. Agricultural institutions, including farmer groups, play a significant role in adopting sustainable technological innovations for farm development. Researchers identified several factors influencing the success of agricultural institutions, such as government support, active participation of farmer institution members, and the economic strength of these institutions. Achieving optimal food security requires institutional innovations that enhance farmers' capacity [3]. Another study examined how food security is defined and assessed within farming systems models. The study found that current food security indicators often fail to align with nutritionists' perspectives on food security. It suggests placing greater emphasis on food consumption expenditure, the scale of food insecurity, and measures of dietary diversity within farming systems. Furthermore, it underscores the importance of addressing the stability dimension of food security, which requires more attention [18]. Another key finding was the potential of agricultural institutions across seven districts in Sukabumi to support agricultural development. These institutions include farmer groups, joint farmer groups, cooperatives, and extension services. The research highlights the substantial potential of these institutions to drive agricultural progress in the region. However, a strategic approach is necessary to optimize their role in improving farmers' welfare [10]. Additionally, the study found that the agricultural institutions identified played a significant role in increasing surplus rice production. However, farmers' limited access to financial institutions remains a challenge that hinders the optimization of food production. This research

offers valuable insights into the relationship between agricultural institutions and agricultural productivity [7].

"Subsequent research revealed that farmer groups play a crucial role in educating farmers, though they still face challenges in facilitation and evaluation. The researchers suggested that increased institutional support is needed to enhance these functions, enabling broader adoption of technology [1]. Another study focused on the role and development strategies of agricultural institutions within Paguyuban Arum Gula, an organization aimed at improving the independence of palm sap farmers. This institution has successfully strengthened its members' participation in social, economic, and environmental aspects. The findings highlighted the importance of a bottom-up leadership approach in fortifying the institution and enhancing member empowerment [19]. In Central Java Province, institutional support for millennial farmers remains relatively low, and agricultural sustainability across economic, social, and environmental dimensions is also below expectations. Researchers advocate for improved institutional backing and the introduction of agricultural technologies that better cater to the needs of millennial farmers [19]. Strengthening institutions is expected to enhance the competitiveness and sustainability of agroforestry farming [20].

Agricultural institutions play a critical role in supporting food security and driving the development of the agricultural sector at local, national, and international levels. The studies indicate that these institutions, which encompass a variety of organizations involved in the agricultural sector, serve as essential support systems for farmers in managing their operations. For instance, research in Jenepono District highlights the pivotal role of farmer groups and extension workers in enhancing farmers' capacity to achieve food security. Similarly, studies in the Sub-Saharan Africa region emphasize that investment in agriculture and the quality of institutions are key factors in improving food security. In contrast, research in Bantaeng Regency focused on horticultural agribusiness, revealing the need to strengthen local institutions in order to boost agribusiness development. Key strategies include providing human resource training, fostering partnerships with financial institutions, and encouraging active participation from institutional members.

Additionally, research conducted in Sukabumi and other regions has highlighted that strong institutions not only boost agricultural output but also facilitate the marketing and distribution of agricultural products, thereby reinforcing food security in the region. Moreover, innovations within agricultural institutions, such as the adoption of more efficient agricultural technologies, underscore the importance of adapting to changing circumstances. Studies on institutional strengthening to support food security in areas like Sukabumi and Bone districts indicate that robust agricultural institutions, with adequate government support, can effectively contribute to the achievement of sustainable food security objectives. Therefore, to achieve optimal food security, it is essential to invest in strengthening existing institutions. This can be done through farmer education and training, improving access to capital and agricultural technologies, and fostering a favorable environment for the development of effective and efficient agricultural institutions. Furthermore, it is crucial to increase the involvement of the private sector, financial institutions, and the education sector in supporting the development of agricultural institutions. This collaboration is necessary to create a more competitive, sustainable agricultural system capable of meeting the food needs of the entire community. By fostering synergy among various stakeholders, it is anticipated that the agricultural sector will experience faster growth and that food security will be more evenly distributed across regions, including those vulnerable to food crises. For instance, research on farmer groups and cooperatives in the region highlights the importance of cooperation between farmers and various institutions to enhance their welfare. Therefore, the strategy of institutional strengthening must be continuously implemented and adapted to the specific needs and challenges of each region. Moreover, it is essential to recognize the growing role of the younger generation, particularly millennial farmers, who are increasingly contributing to agricultural development. To ensure sustainable food security, it is essential to provide farmers with training and support to effectively utilize available technologies and build strong local institutions. Moreover, the sustainability and success of agricultural institutional development rely on partnerships between the government, educational institutions, financial organizations, and farmer associations, in order to create an integrated and mutually supportive system. Through continuous institutional strengthening that emphasizes innovation, technology, and cross-sector collaboration, future food security is expected to be more stable and accessible to all segments of society. In this context, focusing on strengthening local institutions is vital to support food security based on regional needs and resources, while also enhancing the competitiveness of agricultural products in the global market.

4 Conclusion and recommendation

Reviews of several studies indicate that agricultural institutions play a crucial role in supporting food security and sustainable agricultural development. The success of agricultural development is largely dependent on the strength of institutions at both local and national levels. Therefore, strategies aimed at strengthening agricultural institutions, which involve multiple sectors and the active participation of farmers, are essential. Institutional innovation, government support, and the development of human resource capacity within institutions are critical for achieving optimal food security across various regions. Additionally, the responsibility for strengthening agricultural institutions extends beyond the government; it also involves a range of stakeholders, including farmers, farmer groups, extension workers, and financial institutions. Enhancing institutional quality will foster a more conducive environment for improved agricultural development and greater food security in the future.

Based on the research findings, it is recommended that the government enhance support for institutional innovation by offering incentives or training programs aimed at building the capacity of human resources within agricultural institutions. Furthermore, strengthening policies that foster partnerships between the government, financial institutions, and the private sector can help facilitate farmers' access to technology and capital, thereby accelerating the success of agricultural institutional development. Additionally, farmers should actively participate in strengthening agricultural institutions by joining farmer groups or organizations that play a role in decision-making and agricultural development planning.

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