Research on World Agricultural Economy
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ARTICLE

Development of Inclusive Agricultural Policies as an Effort to Address the Challenges of Agricultural Development in Nagan Raya Regency

Nellis Mardhiah [1*] **, *Agus Pratama*** [1] **, *Putri Kemala Sari*** [2] **, *Agatha Debby Reiza Macella*** [1] **, *Nila Safrida*** [3] **, *Safrida*** [1]

[1] *Public Administration Program, Faculty of Social and Political Science, Universitas Teuku Umar, Aceh 23681, Indonesia*

[2] *Department of Law, Faculty of Social and Political Science, Universitas Teuku Umar, Aceh 23681, Indonesia*

[3] *Public Policy and Management Program, Faculty of Social and Political Science, Universitas Gadjah Mada, Yogyakarta 55281, Indonesia*

ABSTRACT

One of the agricultural centers in Indonesia, Nagan Raya Regency in Aceh Province, has experienced a decline in rice production and stagnation. This problem is accompanied by low farmer exchange rates and a low food security index. This research aims to analyze the implementation and challenges of inclusive agriculture in Nagan Raya using a qualitative case study approach by integrating stakeholder mapping and challenge analysis using Inclusive Growth indicators. The method used in this study is qualitative research using NVivo 12 software and data collection using a triangulation system to ensure the validity and reliability of the results. The results show that key actors have a significant influence but have not been able to establish effective coordination that can include all farmer groups in Nagan Raya to actively participate in agricultural programs. Local government policies related to simultaneous planting have proven to have an impact in supporting the agricultural sector in Nagan Raya. However,

*CORRESPONDING AUTHOR:
Nellis Mardhiah, Public Administration Program, Faculty of Social and Political Science, Universitas Teuku Umar, Aceh 23681, Indonesia; Email: nellismardhiah@utu.ac.id

ARTICLE INFO
Received: 17 September 2025 | Revised: 7 November 2025 | Accepted: 11 November 2025 | Published Online: 27 April 2026
DOI: https://doi.org/10.36956/rwae.v7i2.2751

CITATION
Mardhiah, N., Pratama, A., Kemala Sari, P., et al., 2026. Development of Inclusive Agricultural Policies as an Effort to Address the Challenges of Agricultural Development in Nagan Raya Regency. Research on World Agricultural Economy. 7(2): 333–355.
DOI: https://doi.org/10.36956/rwae.v7i2.2751

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obstacles still arise in the form of weak agricultural infrastructure, uneven distribution of aid, and low participation of all farmer groups, including smallholder and women farmers. Therefore, systematic and integrated policies are needed, with focus on infrastructure revitalization, establishment of agricultural machinery centers, quotas for women's participation, and distribution system based on the planting calendar. As a form of contribution to policy development, this study proposes implementation of an inclusive agricultural policy development program as strategic step to realize a fair, productive, and sustainable agricultural system in Nagan Raya.

Keywords: Agriculture; Inclusive Growth; Policy; Stakeholder; Sustainable

1. Introduction

Indonesia is categorized as one of the world's leading agricultural producers [1]. However, even though the agricultural sector is a source of income for 873 million people globally, or 27% of the total global workforce, Indonesia imports far more rice than it exports [2]. It's picture on **Figure 1** below:

Export

No	Country	Export sale (000 USD)	
		2019	2023
1	India	6,800,670	10,462,013
2	Thailand	4,206,796	5,115,959
3	Vietnam	2,434,252	3,777,516
4	Pakistan	2,277,005	2,860,636
5	United States	1,866,591	2,015,459
6	Cambodia	421,108	1,878,995
7	China	1,058,958	983.75
8	Italy	619,024	968,228
.....			
71	Indonesia	700	1815

Import

No	Country	Import sale (000 USD)	
		2019	2023
1	Indonesia	184,254	1,789,024
2	China	1,253,454	1,407,464
3	United States	1,086,354	1,422,519
4	Philippines	1,009,687	1,635,577
5	Saudi Arabia	1,415,088	1,534,388
6	Iraq	857,759	1,338,877
7	Malaysia	452,695	819,849
8	England	530,661	749,966
9	Japan	489,748	745,692
10	Iran	1,694,297	736,353

Figure 1. Table of Rice Export and Import Data [3].

Based on the data in **Figure 1**, although Indonesia is the world's largest rice importer, its position as a rice exporter is very low, ranking 71st [3]. One of the main factors driving high rice imports is the demand for rice that cannot be met locally [4] (p. 713). Aceh Province is among the top 10 largest agricultural producing provinces in Indonesia, but Nagan Raya Regency, West Aceh, as one of Aceh's agricultural suppliers, faces serious challenges. Rice production in this region continues to decline [5]. Furthermore, increasing of rice production in Nagan Raya describe on **Figure 2** below:

Nagan Raya District, West Aceh		
Years	Paddy Production (tons)	Rice Production (tons)
2022	63,136.39	36,371.79
2023	54,313.59	31,289.12
2024	67,942.01	39,140.00

Figure 2. Table of Aceh Province Central Statistics Agency (BPS): Agricultural Production [6].

According to **Figure 2**, Nagan Raya Regency, West Aceh, rice production increased in 2022 but experienced a drastic decline in 2023. Although there was an increase in 2024, it was not significant compared to 2022, and the agricultural office predicts a decline in 2025 [7].

Report January to April 2025 explain that agriculture production Nagan Raya decreased from 16.97 thousand ton to 8.07 thousand ton [7]. In line with the decrease in production, the farmer exchange rate in Nagan Raya also fell by 0.80% compared to the previous month [5]. This situation is exacerbated by Nagan Raya's low Food Security Index (IKP), which ranks the district 226th out of 416 districts with an IKP percentage of 76.29% in 2023 [8].

These various challenges indicate that Nagan Raya has yet to fully implement the concept of inclusive agriculture, which is an approach that integrates various parties, including farmers, in the policy-making process [9] (p. 2). A lack of synergy among stakeholders and minimal involvement of farmers as key actors demonstrate that this concept has not been implemented optimally [10]. Considering this issue has rarely been researched in Indonesia, particularly in Nagan Raya, this study will focus on analyzing the implementation of inclusive agriculture in the district. Nagan Raya itself has designated agriculture as a development priority for 2025. This is in line with the national development agenda [11], especially Asta Cita Pembangunan point 2 on food and point 4 on human resource development, this study aims to analyze and formulate an inclusive agricultural policy model that involves strong integration between actors [12]. The primary focus is on strengthening social capital through agricultural reform to realize inclusive agricultural innovation based on collaboration between civil societies, academics, and the government [13].

In addition, this research supports Sustainable Development Goals (SDGs) that combine three main pillars [14] (pp. 2, 3): Economic growth, Social equity, and Environmental protection to meet the needs of the present, such as food, clean water, and shelter, without compromising the vital resources of future generations [15] (p. 2).

Literature Review

Several previous studies have highlighted issues such as agriculture, food security, and resource management using various approaches. The previous studies emphasize that achieving high sustainable growth is in line with policy development efforts that first address social barriers related to equality [16]. The research will be specifically measuring social inclusion through indicators such as women's involvement in decision-making and equal access to assistance for tenant farmers, which are rarely explored in detail.

Some previous research like Guangyu Xu (2025) emphasized the need for a review of land property rights reforms that could potentially worsen income inequality [17], meanwhile Vermila et al. (2025), highlighting the factors that influence farmer behavior in the development of the sago agroindustry [18]. Further at the macro level, Yan Y et al. (2025) emphasizing the importance of digital financial inclusion as an effort to modernize agriculture and global food security [19]. From gender perspective, Nchanji E.B. et al. (2025) show that gender dynamics, particularly those related to equal access to land, are crucial factors in strengthening farmer resilience [20]. More specific study on resource management was conducted by Salas-Bravo et al. (2025) which mapped stakeholders in the issue of water scarcity in the agricultural sector, supported by six strategic aspects such as community strengthening, regional management, and the integration of traditional knowledge into public policy [21].

In Aceh Province, finding raised by Mardhiah et al. (2024) emphasize the importance of the Keujruen Blang traditional agricultural institution in promoting inclusive agriculture in Aceh [22]. Mardhiah et al. (2024) also show that the synergy of rice farming governance policies in West Aceh is still not well integrated, and even the position of customary institutions at the village level is still ambiguous [23]. From the outside Aceh context, Abdelkader et al. (2024) highlight regulations and collaboration in the development of Power Virtual Plants [24], furthermore Shah et al. (2022) emphasize agrotourism as a sustainable development strategy in Fiji [25]. Finally, Ernawati et al. (2021) tested the effectiveness of village funds for inclusive growth in Indonesia [26]. Several of these studies show that the issue of inclusivity in agriculture has been widely addressed, from the aspects of gender, technology, resources, to local wisdom.

However, a review of the literature reveals a gap in research. First, there has been no study specifically discussing the development of inclusive agricultural policies in Nagan Raya District. In fact, as part of a region with special autonomy status [27], Aceh has a decentralized structure that allows for the creation of more adaptive policies based on local wisdom [28]. Second, the agricultural sector in Nagan Raya faces serious challenges in the form of declining productivity, low farmer exchange rates, and limited participation of marginalized groups such as women and small farmers in the policy process. Third, despite its potential as a major food supplier in Aceh, agricultural sector development has been uneven and tends to favor dominant groups. Third, despite its great potential as a food supplier for Aceh, access to agricultural sector development has not been evenly distributed, requiring inclusive policies that are able to target all levels of society.

Previous studies have discussed agricultural issues from various dimensions such as land property rights, gender, technology, customary institutions, and stakeholder mapping, but none have specifically examined inclusive agricultural policies in Nagan Raya District. In addition, the Stakeholder Management Theory (SMT) framework [29] (p. 183) is an approach that tends to focus on powerful actors, thus failing to capture the dynamics of marginalization of low-power groups such as women and small farmers. Meanwhile, the concept of inclusive growth, which emphasizes the involvement of marginalized groups, has not been systematically integrated into stakeholder analysis [9]. Therefore, this study offers a novelty in the form of integrating the SMT power-interest grid with the concept of inclusive growth to map power relations while making the impact on marginal-

ized groups an indicator of development success that is equivalent to economic growth. Furthermore, the novelty of this study is also proven by the following Vosviewer bibliometric analysis on **Figure 3** below:

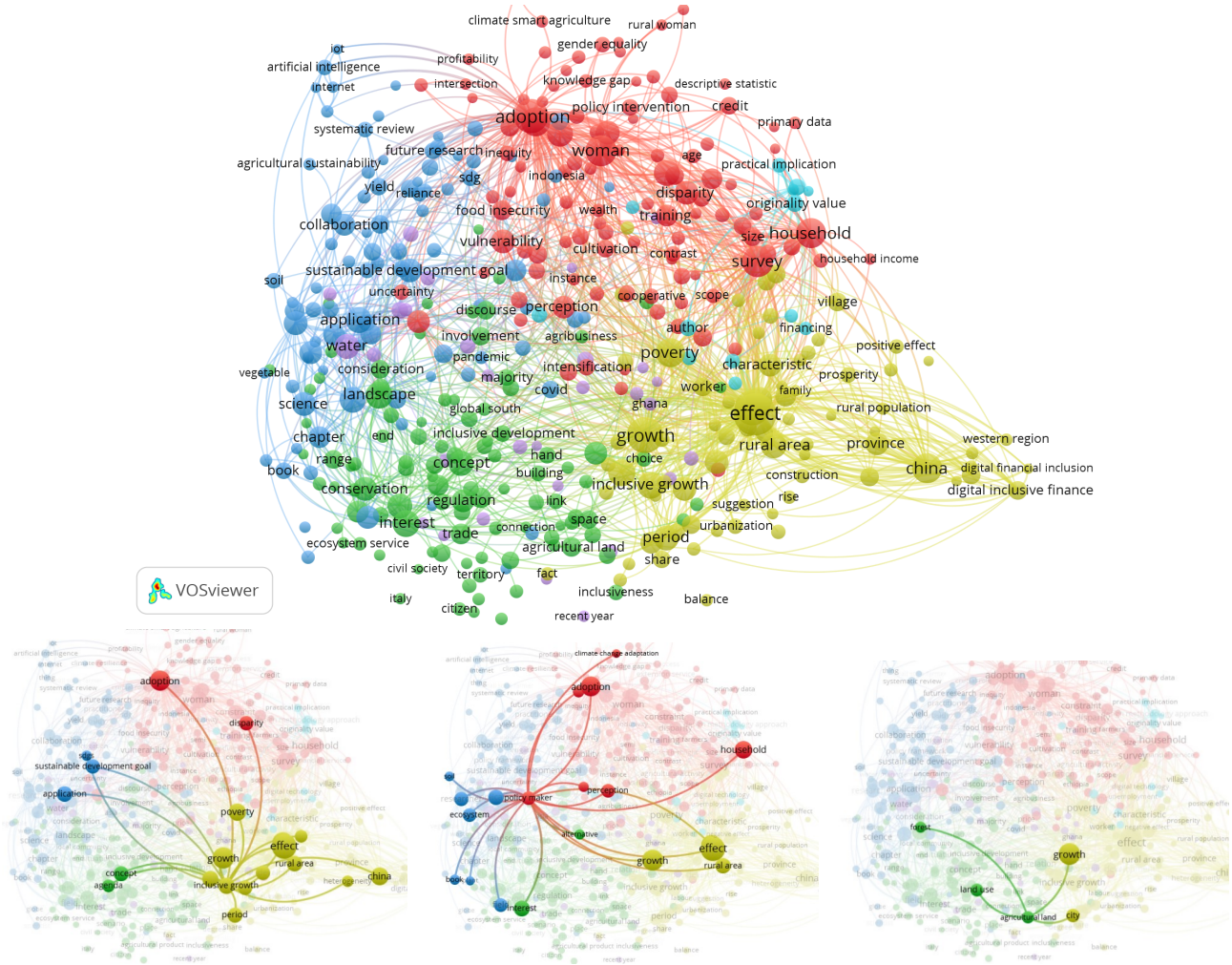


Figure 3. Analysis Bibliometric using VOSviewer software.

Processed by Author, 2025.

The bibliometric analysis using VOSviewer software shows studies on inclusive agricultural policies marked with four main colors (red, yellow, blue, and green). following is an explanation below:

1) The concentration of studies on agriculture in green is still accommodated only in the global context, particularly in China and Sub-Saharan Africa, and emphasizes issues of land use, urbanization, and poverty alleviation.
2) The keyword policy maker, depicted in red, indicates research that is more closely related to policy adoption, households, and ecosystems, rather than the formulation of inclusive agricultural policies based on local wisdom.
3) The keyword inclusive growth, depicted with a yellow bullet, tends to be mapped to poverty, inequality, and sustainable development goals (SDGs), but is not yet explicitly linked to the design of inclusive agricultural policy at the regional level.
4) Continuing with sustainable development (SDGs), SDG-based agricultural development is depicted in blue bullets that are related to the actualization of inclusive growth programs and policy makers.

Based on VOSviewer bibliometric analysis, this study attempts to fill the gap in research on the development of inclusive agricultural policies that involve lo-

cal customary institutions and farmer communities as active participants in development. Taking a case study in Nagan Raya Regency, which is classified as an area with great agricultural potential and has special autonomy status, this study emphasizes how the development of inclusive agricultural policies in Nagan Raya can be designed to integrate agricultural development, socio-economic inclusion, and local regulations called Qanun (Qanun on LP2B). Thus, this study not only contributes to expanding the academic discourse that is still centered on global issues but also provides contextual policy recommendations in line with regional needs.

2. Materials and Methods

This research is a qualitative study using a single-case study approach in Nagan Raya Regency. Cresswell states that single-case studies are used to explore complex phenomena in depth [30] (pp. 102, 103). In the context of Nagan Raya, this approach is used to conduct a holistic analysis of the interactions between various actors in the development of inclusive agricultural policies. The problem-solving approach in this study integrates Ackerman's Stakeholders Management Theory (SMT), specifically the power-interest grid model, as an analytical framework to map the power and interests of each actor in **Figure 4** [31]. In addition, the concept of Inclusive Growth is used as an analytical lens to analyze policy development strategies and challenges in inclusive agriculture through two main indicators: High Sustainable Growth and Social Inclusion [32] on **Table 1**.

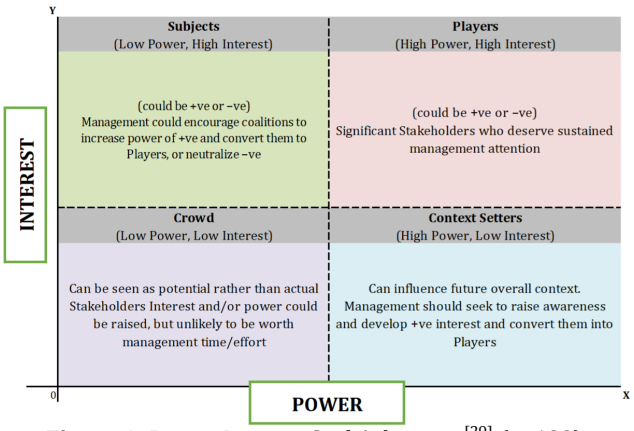


Figure 4. Power-Interest Grid Ackerman [29] (p. 183).

Table 1. Table of Inclusive Growth Indicator [33].

High Sustainable Growth	Investment in basic infrastructure Agricultural sector productivity Infrastructure and connectivity Stable macroeconomics and trade
Social Inclusion	Gender equality Equitable access to public and private resources Creation of broader economic opportunities Local institutions play a role in maintaining social justice, access, and policy legitimacy

According to **Figure 4**, the power-interest grid is used to map stakeholders (actors) who have roles and interests in policy development and implementation. Relevant parties will be identified using the X and Y axis quadrant graph of the power-interest grid to categorize the level of interest and power [29] (pp. 184, 185) which covers 4 main aspect below:

a. Quadrant Subjects: High Power – Low Interest
b. Quadrant Players: High Power and Interest
c. Quadrant Crowd: Low Power and Interest
d. Quadrant Context Setter: High Power – Low Interest

As for the data analysis model used, it employs an interactive qualitative data analysis model developed by Miles and Huberman [34]. This model describes a cyclical and interactive process between data collection and data analysis, which are interrelated [35]. Miles and Huberman present the data analysis process through three main components [34] (pp. 10, 11):

a. Data Reduction: this component consists of the process of selecting, focusing attention, simplifying, abstracting, and transforming raw data that emerges from field notes or transcripts [34] (p. 10).
b. Data Display: After the data is reduced, it is or-

ganized into a display that allows for conclusions and actions to be drawn [34] (p. 11). The data is presented using graphical descriptions and tables from the analysis of interviews with agricultural stakeholders in Nagan Raya.

c. Conclusion Drawing and Verification: This component is the stage of drawing conclusions based on the collection of research data and continuous verification throughout the research process [34] (p. 11).

To ensure the reliability and validity of qualitative research, data analysis in this study also used NVivo12 software as an analysis tool, with analysis stages comprising data import, case node preparation, theme coding, and query and visualization [36] (pp. 273, 274). NVivo12 is used as an effective analysis tool to address data validity by combining various data sources, including field observation notes, interview transcripts, and other supporting documents [37] (pp. 6, 7). NVivo12 was chosen because it can cover all components of the research data to be presented in tabular and graphical form. In this research, Nvivo12 also served as a tool for mapping the obstacles and challenges in Nagan Raya agriculture, adjusted to the indicators and roles of the relevant stakeholders. This is also supported by the use of a data collection method using source triangulation [38]. Triangulation involves the use of three main data collection sources, namely semi-structured interviews with key stakeholders, direct observation of agricultural practices and community interactions, and analysis of relevant documents such as policy regulations, regional planning documents, and archives. By combining these various forms of evidence, the research not only strengthens its validity but also allows for a more holistic picture of the case being studied. The following is a further explanation of the components used in data triangulation:

2.1. Observation

This research uses a case study approach with a focus on the agricultural sector, conducted in Nagan Raya District, Aceh Province. The location was chosen based on the significance of Aceh Province as one of the 10 largest rice-producing provinces in Indonesia [3]. Specifically, the research locations were in Beutong, Suka Makmue, and Jeuram subdistricts. It should be noted that Aceh has implemented Aceh Qanun No. 5 of 2012 concerning the Protection of Sustainable Food Agricultural Land (LP2B) [39]. This is a geographical view of the research location in Nagan Raya Regency (**Figure 5**):



Figure 5. Geographical condition in Nagan Raya and Satellite capture of Krueng River (agriculture irrigation sources) [40].

Based on field observations over a period of two weeks, including reviews of policy development locations and observations of agricultural activities, Nagan Raya Regency has considerable potential for developing the agricultural sector as the main source of income for the community. The reality on the ground shows that there are a number of challenges in policy implementation. This is supported by a report from the Aceh Agri-

culture and Plantation Service (Distanbun) which states that 1716 hectares of land in Aceh are prone to drought, especially during the dry season [41]. As shown in **Figure 5**, the Krueng Seunangan River is one of the water sources mentioned by the local government as a source of irrigation for all subdistricts in Nagan Raya. However, findings show that water shortages occur when all subdistricts carry out simultaneous planting programs. These findings serve as a starting point for further examination of the relevance and effectiveness of policies aimed at inclusive agricultural policy development.

2.2. Interviews

This study uses a qualitative approach with a case study method in Nagan Raya District. Informants were selected using purposive sampling [42], which involves deliberately selecting respondents based on their roles, knowledge, and involvement in the formulation and development of inclusive agricultural policies. There was a total of 29 informants, grouped in **Table 2**, who were selected as key informants because of their involvement in providing relevant data for stakeholder mapping analysis based on their interests and power. The interview process was carried out over two months, and the results of the interviews were used to understand the interests, level of influence, and contributions of the actors to the policy development process.

2.3. Documentation

In additional to conducting direct observations at agricultural sites in Nagan Raya District and interviews with relevant actors, this study also utilized documentation techniques. The documentation was carried out by examining various relevant policy and regulatory documents, both at the national and regional levels. One important reference is the regulation on Sustainable Food Agricultural Land (LP2B), which is a legal instrument to protect and maintain the availability of food agricultural land from uncontrolled conversion. The regulation on LP2B provides a framework for protection so that food security is maintained in the long term and ensures the sustainability of agricultural activities in the region. In doing so, the study also refers to the Qanun Aceh, which holds a strategic position because Aceh is a region with special autonomy status. The Qanun not only functions as a regional regulation but also accommodates local values and a vision of sustainable development oriented towards food self-sufficiency.

Table 2. List of Informant.

No	Number of Respondent	Actor	Description
1	3	Agriculture Office	Lead Actor
2	6	BAPPEDA (Regional Development Planning Agency)	Lead Actor
3	4	PT Kilang Padi Company (Rice Mill)	Lead Actor
4	2	Banking Company	Supporting Actor
5	3	Farmer Group	Lead Actor
6	2	Keujreun Blang / KJB (Acehnese traditional agricultural Organization)	Lead Actor
7	2	Bulog (National Logistics Agency)	Lead Actor
8	1	NGO (Agricultural Extension Workers)	Supporting Actor
9	2	Farmer Community Representatives	Lead Actor
10	2	Farmer Community	Lead Actor
11	1	Non-Farmer Community	Supporting Actor
12	1	Academics	Supporting Actor

Processed by Author, 2025.

3. Results

3.1. Stakeholder Mapping

Patton [43] (p. 759) in analyzing qualitative research uses set theory as the basis for an assessment rubric that combines deductive and inductive analysis. In this research, the actor analysis rubric was created using a power–interest framework as the basis for categorizing (deductive), while detailed descriptions of the assessment criteria for each score (e.g., 1 to 10) were constructed from interview results and field findings (inductive). Thus, the analysis process was deductive-inductive, in line with Patton's [43] (p. 760) assertion that categories in qualitative

analysis are not rigid but flexible and contextually determined. The research findings are illustrated in a graph based on the following scoring guide on the **Table 3** and Stakeholder Mapping on the **Figure 6** below:

Table 3. Scoring Table of Stakeholders.

Skor	Power	Interest
10	Have full authority to regulate policy at the national/ regional level.	Encourage change and tend to prioritize inclusive agriculture issues at every opportunity.
9	Have a major role in decision-making, as well as a strategic position in policy development.	Actively involved in initiating programs and make regular, tangible contributions.
8	Has strong influence at the regional level and plays a role in controlling most of the resource distribution process.	Frequently involved and makes significant contributions, active in most activities and cross-actor coordination.
7	Has a position of influence in a particular sector and is able to influence policies/programs at a certain level.	Frequently involved but not always in a leadership role, actively participates in a particular sector.
6	Has access to or control over a specific challenging sector but not overall.	Regularly involved in a specific sector and acts as a liaison between stakeholders.
5	Relatively small influence, only recognized within the community or internal group, with sufficient capacity to influence policy.	Involved as directed or invited and focused on internal community activities.
4	Almost no formal authority, only informal or based on personal relationships.	High personal interest, but low involvement in formal forums.
3	No formal power, rarely involved in decision-making, and limited access to resources.	Still interested in agricultural challenges or obstacles but rarely involved.
2	There's no impact whatsoever on policies or programs implemented.	Low interest, rarely involved, and only participates if there is direct benefit.
1	No influence, position, or access to policies/budgets whatsoever.	Not interested and never involved in inclusive agriculture issues.

Processed by Author, 2025.

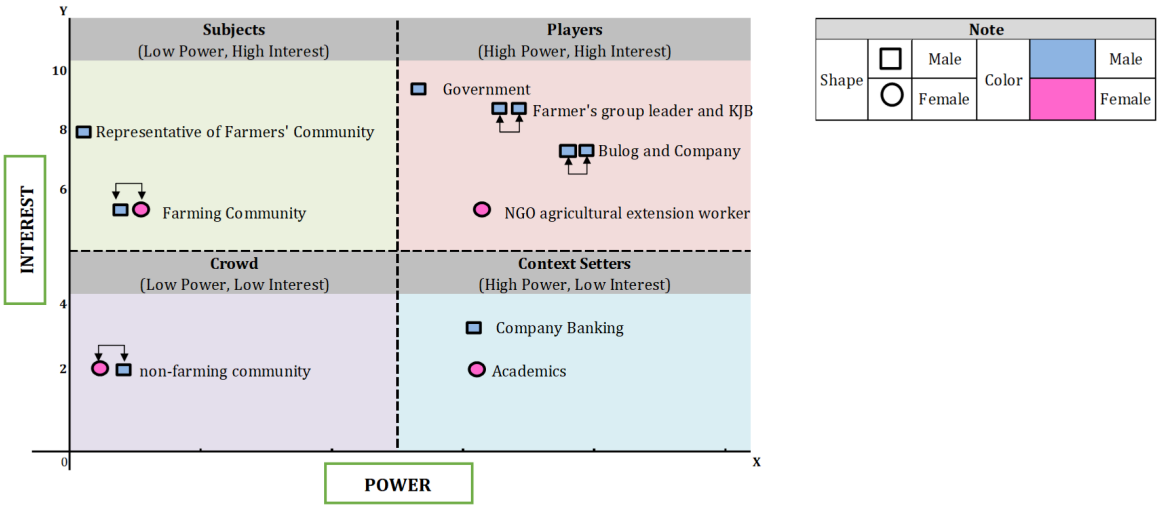


Figure 6. Stakeholder's Nagan Raya Mapping.

Processed by Author, 2025.

The results of the mapping show that each actor occupies a different position in the four main quadrants, namely subjects, players, crowd, and context setters, each of which has strategic implications for the success

of inclusive agricultural innovation in the Nagan Raya region. Based on **Figure 6** and the results of interviews with key actors and supporting actors in the development of the agricultural sector in Nagan Raya, the following was produced:

a. Quadrant Players (High Power – High Interest)

1. Local Government (Nagan Raya Agriculture Office and BAPPEDA): As the primary decision maker, the local government has full authority in determining agricultural policies, budgets, and regulations. Their priority on the rice farming sector and active involvement in cross-party coordination reflect their high interest.
2. Farmer Group Leaders and Keujreun Blang: Both hold significant influence at the local level, playing a role in regulating crop patterns, mediating conflicts, and ensuring that agricultural programs run according to agreement. High interest because their livelihoods are highly dependent on agricultural yields.
3. Logistics Agency (BULOG) and Private Sector (Rice Mills): Control distribution, grain prices, and rice stocks, as well as maintain supply quality. Their role is strategic in the food supply chain, so they have a high level of interest and involvement in agricultural policy.

b. Quadrant Subjects (Low Power – High Interest)

1. Farmer Community Representatives: Highly dependent on agriculture as their main source of livelihood, resulting in high interest in policy. Formal power to influence policy direction is limited.
2. Farmer Communities: High interest due to their direct role in production and household management, but access to government resources and programs remains limited.

c. Quadrant Context Setters (High Power – Low Interest)

1. Local Banking: Has the capital and ability to finance, but the focus of financing is not comprehensive across all commodities, so direct involvement in rice farming is limited.
2. Corporate Private Sector: Has the capital to finance but has low interest in the development of agriculture in Nagan Raya.
3. Academic informants have high power as educators and extension workers for programs or activities in the agricultural sector, but their involvement in the field is still minimal.

d. Quadrant Crowd (Low Power – Low Interest)

According to the mapping graph, the actors in this quadrant are the general public who are not farmers and several young people who are reluctant to work in the agricultural sector.

The stakeholder mapping and in-depth interviews with all actors in Nagan Raya show that inclusive agricultural development in Nagan Raya District is supported by key actors who occupy different positions in the four quadrants of power and interest. Interviews with the Agriculture Office, BAPPEDA, the Head of the Farmer Group, and Keujreun Blang confirmed that cross-sector coordination, policy alignment, and crop management are dominant factors in the program's success. Bulog and rice mills view their role not only as distributors and price managers, but also as guarantors of quality and supply chain stability. These results are in line with the field perception that the synergy of actors in the players quadrant is the main driver of change, while women farmers and the general public in the subjects quadrant need support in accessing resources, technology, and training so that their voices can be more influential in the policy formulation process.

On the other side, interviews with banks and private companies reveal that despite their large capital capacity, their interest in the rice farming sector remains low, placing them in the context setters quadrant. Involvement from these actors is often reactive, emerging when there are specific incentives or interests. Meanwhile, the younger generation who are reluctant to farm and non-farming communities in the crowd quadrant are indicators of the challenges of regeneration and shifting work interests in rural areas. This mapping underscores the need for different advocacy strategies for each quadrant: intensifying collaboration with players, empowering subjects, building incentives for context set-

ters, and designing awareness campaigns to change the perceptions of the crowd group.

3.2. Inclusive Growth Indicator Analysis

According to the results of interviews conducted, rice productivity in Nagan Raya in 2023–2024 has not shown a significant increase[44] even though a simultaneous planting policy has been implemented in accordance with Qanun No. 2 of 2021[45]. The successful implementation of this planting pattern is evident in areas with strong organizational structures, such as Suka Makmue District, while in other areas like Beutong and Seunagan Timur, challenges persist due to coordination issues among extension workers and the distribution of production inputs. While supporting policies such as LP2B[39] play a role in preventing land conversion, there are no specific policies addressing critical issues such as irrigation water shortages or the empowerment of vulnerable farmer groups. The primary coordination mechanisms through development planning meetings and customary forums involve Keujreun Blang, farmer groups, extension workers, and private partners such as rice mills. While all components of the main and supporting actors are involved, the resulting decisions are often one-sided and do not address the priority needs of farmers, such as fertilizers, soil cultivation, and irrigation infrastructure. Furthermore, the development of Nagan Raya's inclusive agricultural policy is analyzed based on two main indicators, High Sustainable Growth and Social Inclusion, which have been localized based on the challenges of the Nagan Raya agricultural sector[46] by integrating the results of stakeholder mapping. In addition, the research results also analyze two main indicators of inclusive growth, namely high sustainable growth, which is explained in points 3.3 to 3.6, and social inclusion, which is explained in points 3.7 to 3.10.

3.3. Water Access and Simultaneous Planting Program Implementation

Based on the results of the NVivo 12 analysis on **Figure 7**, supported by interviews with the Nagan Raya Agriculture Office, there is no specific policy to address water shortages[47].

At the end of 2023, for example, the North Aceh Agriculture and Plantation Office reported that 897 hectares of land were experiencing drought[48]. In October 2024[49], the parliament (DPR) conducted a direct review and stated that the Jeuram irrigation system was no longer functioning properly[49]. However, this statement contradicts the interview with the local government, which assessed that the issue of water access depends more on the DPR's proposals, while the realization of programs is often uncertain. These different views reflect a lack of alignment between the legislative and executive branches of the regional government, which has the potential to hinder targeted irrigation improvement and revitalization efforts.

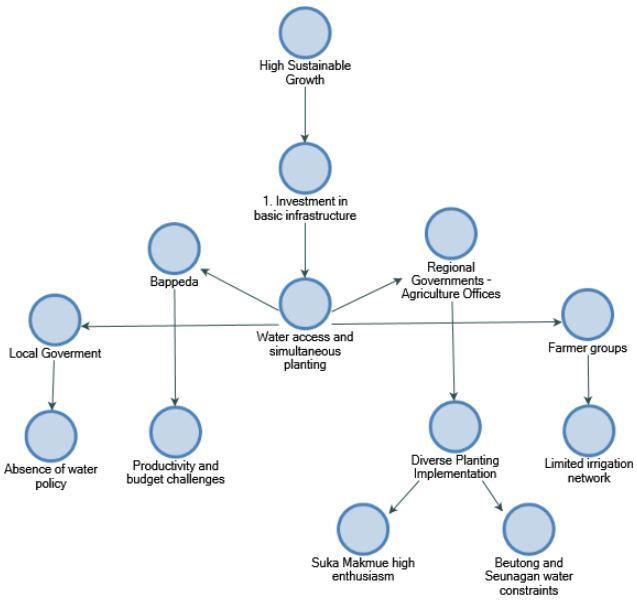


Figure 7. Water Access and Simultaneous Planting Program Implementation.

Processed by Author with NVivo12, 2025.

The simultaneous planting program in Nagan Raya Regency has had mixed results. In several subdistricts, such as Suka Makmue, this policy has succeeded in generating enthusiasm among farmers due to the uniformity of the planting schedule, which makes it easier for the government to supervise and provide assistance through extension workers. However, in other areas, such as Beutong and East Seunagan, implementation has not been optimal due to limitations in the water distribution system and weak technical coordination. Nevertheless, the local government continues to emphasize that simultaneous planting is a priority policy based on

Regional Regulation No. 5 of 2024 [50], while farmers' groups and Keujreun Blang consider this practice effective in reducing the risk of pest attacks and strengthening solidarity among farmers, despite constraints in the availability of production facilities, including soil cultivation tools and subsidized fertilizers.

For businesses, especially Bulog and rice mills, the simultaneous planting program over the past year has had a positive impact in ensuring the simultaneous availability of large quantities of grain. This facilitates the absorption of harvests, maintains the stability of grain prices, which last year rose to IDR 6000/kg, and ensures relatively uniform rice quality in the market. The sustainability of the program still faces challenges in the form of limited irrigation that is unable to support simultaneous planting in all sub-districts and low participation from the non-agricultural private sector. Thus, an evaluation of the implementation over the past year shows that simultaneous planting has become an important instrument for regional food productivity and supply chains, but requires strengthening of infrastructure, regulations, and coordination across actors in order to be more optimal.

3.4. Crop Yield Productivity

In line with the 2025 North Aceh Regency Local Government Work Plan (RKPD) and analysis using Nvivo12 that as shown on the **Figure 8**, rice crop yield productivity needs to be improved because it did not experience a significant increase in 2023 to 2024 [51]. Interviews indicate that crop productivity in Nagan Raya Regency over the past year has shown no significant trend despite various programs implemented by the local government. The Department of Agriculture emphasized that although the region's demographics are very supportive of rice farming, productivity gains remain limited due to issues such as uneven water distribution, lack of production facilities, and poor soil quality control.

From the farmers' perspective, farmer groups and keujreun blang said that harvests often do not cover production costs, especially for tenant farmers or land tenants. They also face challenges such as pests, high prices of pesticides, and limited soil cultivation tools. Although the private sector and Bulog confirm that the absorption of farmers' grain is relatively stable, with the price of wet grain reaching Rp6000/kg last year, the sustainability of productivity still depends on the consistency of supply and the quality of the yield. At the community level, especially among small farmers, many are still looking for additional work because rice harvests are not sufficient to meet their daily needs, so agricultural productivity has not yet fully impacted welfare improvement.

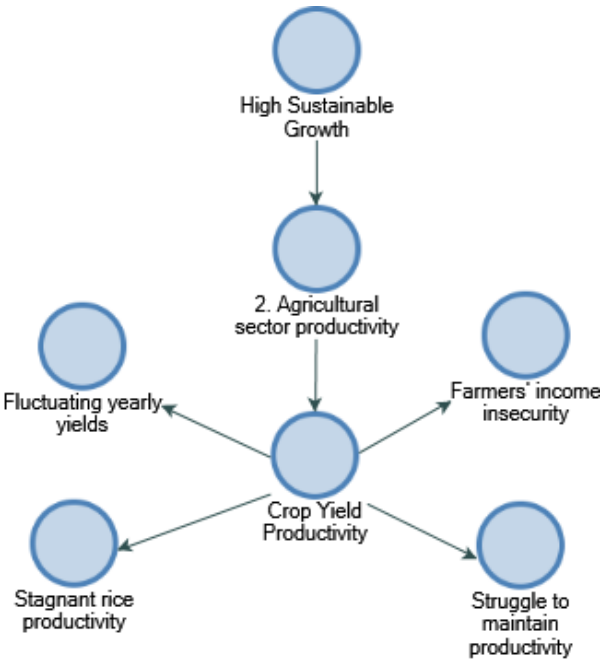


Figure 8. Crop Yield Productivity.

Processed by Author with NVivo12, 2025.

3.5. Availability and Effectiveness of Infrastructure

The Agriculture Office highlighted the issue of infrastructure related to the limited availability of soil cultivation tools, which is rarely addressed. Several assistance programs from the Aceh provincial government that have been implemented, such as the provision of subsidized fertilizers, pesticides, and agricultural tools, have not been fully effective due to their limited quantity and distribution that does not always match the needs in the field. As shown in the **Figure 9**, in this case, agricultural extension workers play a role as a bridge of information between the government and farmers, but the reality in the field shows that there are a limited number of extension workers, which makes supervision and assistance at the village level not optimal.

From the farmers' perspective, farmer groups and Keujreun Blang (KJB - Local Agriculture Organization in Nagan Raya) emphasize the need for basic facilities such as soil cultivation tools (tractors), access to fertilizer, and irrigation systems that can ensure the continuity of simultaneous planting. Many tenant farmers admit that they have difficulty obtaining fertilizer at kiosks due to limited administrative data, so not all farmers can access subsidies. Meanwhile, private parties such as rice mills occasionally provide assistance in the form of equipment rental, but the scale of support is still small compared to actual needs. As a result of these infrastructure limitations, the effectiveness of the simultaneous planting program, which is an LP2B program, is uneven across all subdistricts in North Aceh. Some farmers still have to find alternative jobs to cover production costs. Thus, the sustainability of the agricultural sector in Nagan Raya requires serious attention to the provision of infrastructure that is more equitable, targeted, and sustainable so that simultaneous planting activities show an increase in success across the entire area of Nagan Raya and not just in one or two areas.

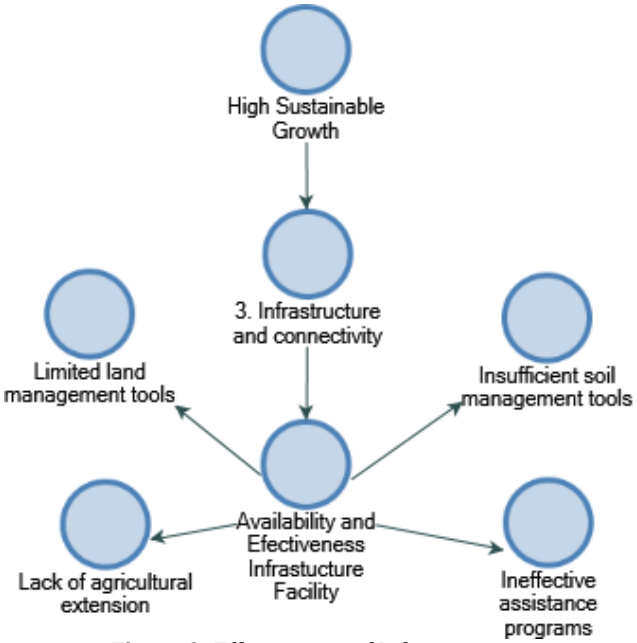


Figure 9. Effectiveness of Infrastructure.

Processed by Author with NVivo12, 2025.

3.6. Grain Price Stability

Analysis using Nvivo12 on **Figure 10** below, also supported by interview results, shows a difference in opinion between the local government and the private sector regarding the stability of grain prices. According to the Nagan Raya District Agriculture and Livestock Service, rice productivity in 2024 will increase compared to the previous year, although the increase will not be significant.

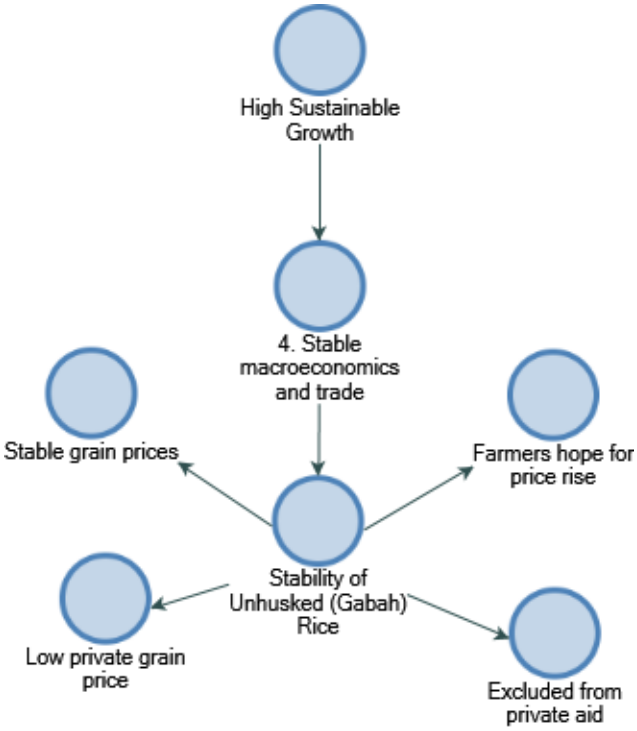


Figure 10. Grain/Paddy price stability.

Processed by Author with NVivo12, 2025.

The local government stated that rice prices were considered stable because farmers could sell directly to industry. However, the local government remained concerned about declining crop productivity, which could lead to increased poverty and reduced farmer welfare. Meanwhile, the private sector (rice mills) complained about the decline in crop productivity due to the unsuitability of seeds to soil conditions and the lack of simultaneous planting in an area, which resulted in difficulties in controlling pests and prices that did not meet farmers' expectations.

3.7. Women's Involvement in Decision Making

Based on the stakeholder mapping in **Figure 7**, the main actors with high authority are dominated by men, including the position of head of the farmer group or

Keurjeun Blang (KJB) in Nagan Raya. Of the 12 actors identified, only 2 actors are specifically women, namely academics and agricultural extension workers. Furthermore, **Figure 11**, analysis using Nvivo12 also describe that women represent only 16.6% of all actors mapped. Key actors and other supporters are dominated by men. Basically, women farmers participate in the planting process and crop processing. However, women's roles in policy development tend to be in the field of operational extension and socialization and they are not yet actively involved in policy development formulation. The role of women in decision-making is still minimal, and there is virtually no role for women in policy-related decision-making. The voices of women farmers are still heard in some evaluation forums after simultaneous planting, but basically, decision-making capacity is still dominated by men who play a role as leaders of farmer groups and other relevant stakeholders.

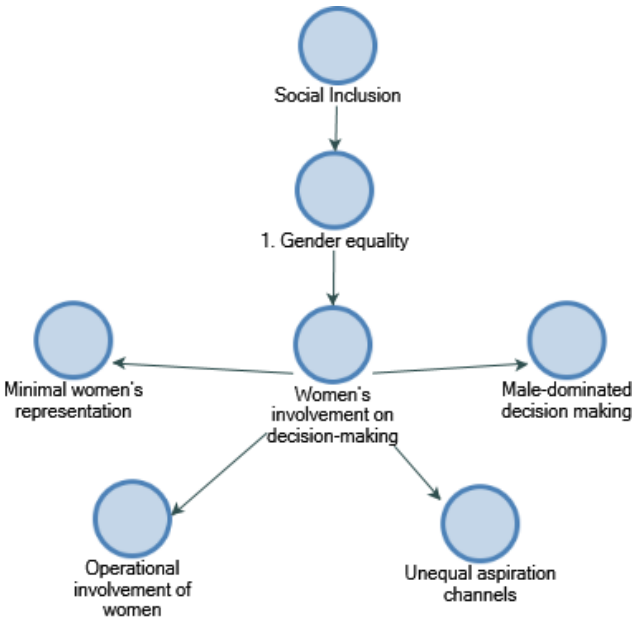


Figure 11. Women Involvement.

Processed by Author with NVivo12, 2025.

3.8. Equal Access to Assistance

Based on **Figure 12**, analysis using NVivo 12, equal and equitable access to agricultural assistance in Nagan Raya still faces challenges. Assistance from the government, such as liquid fertilizer and seeds, is distributed through the aspirations of members of the House of Representatives and extension workers, but this is often uneven and triggers conflicts due to perceptions of injustice among farmer groups.

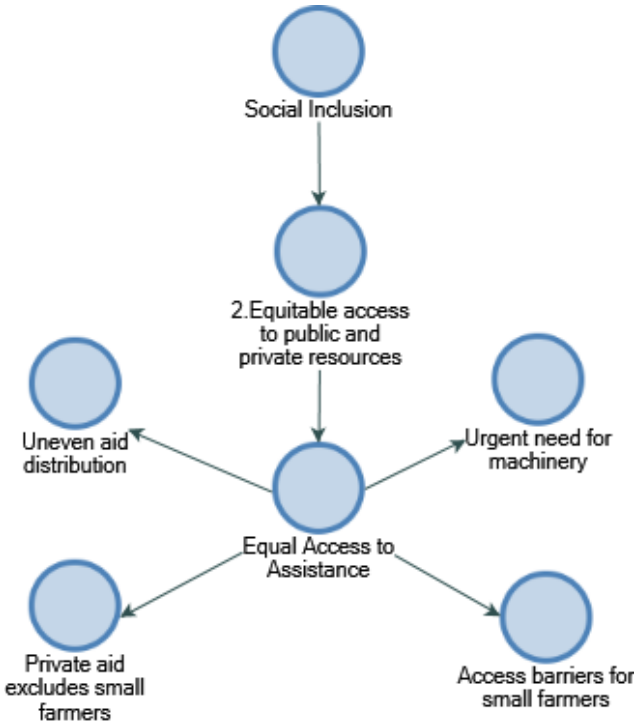


Figure 12. Access to Assistance.

Processed by Author with NVivo12, 2025.

Some farmer groups mentioned that there are private parties (companies) that have the power to provide assistance and large amounts of capital, but Nagan Raya is not included in the areas supported by these private parties. The problem of the lack of simultaneous planting in Nagan Raya has meant that private parties with the potential to provide assistance have not yet chosen Nagan Raya as one of the areas they support. On the other hand, there are also rice mills (private parties) that assist agriculture in Nagan Raya, which have high power and interest in the quadrant players in **Figure 6**, which also play a role in controlling rice distribution and have networks with farmers. However, implementation in the field shows that some assistance or partnerships from the private sector do not yet cover all farmers, including tenant farmers, which include small daily laborers and women farmers.

3.9. Reduction of Income Equality

In terms of the community, especially farmers, there are several major complaints that they have raised.

Based on analysis as shown on **Figure 13**, the main problem is many farmers in Nagan Raya are tenant farmers or farm laborers who are classified as small farmers and do not own land.

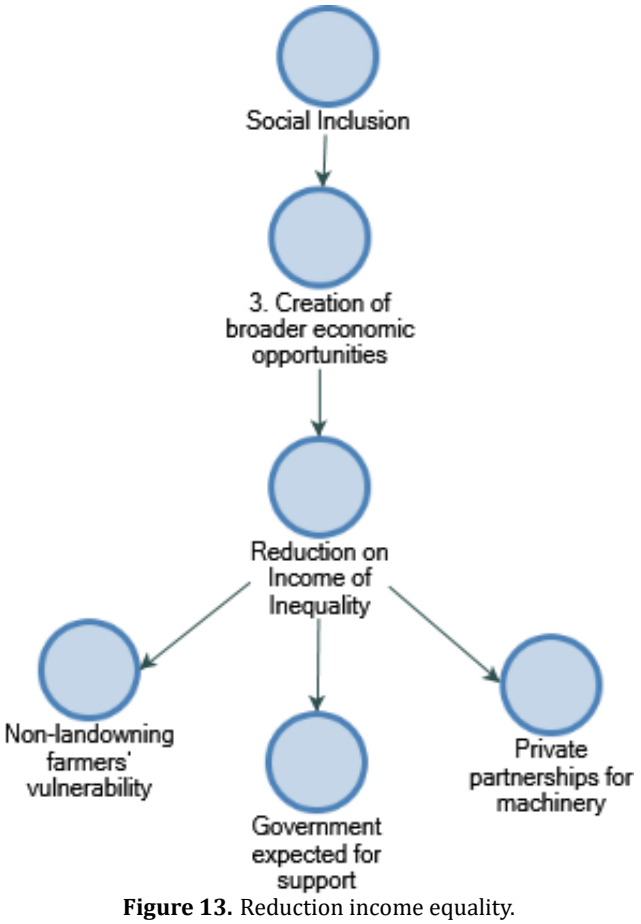


Figure 13. Reduction income equality.

Processed by Author with NVivo12, 2025.

Therefore, their income cannot guarantee the economic welfare of their families, and their food supply is highly dependent on government assistance programs. Representatives of farmer groups, including the KJB customary institution, expect the government to follow up by prioritizing the development of water infrastructure and the provision of agricultural equipment such as tractors, which are currently still limited. Some farmers interviewed also feel that the prices offered by industry are sometimes considered low, which can trigger conflict. On the other hand, the role of customary institutions such as Keujreun Blang is considered important as a conduit for farmers' aspirations, but their position is still weak and the aspirations they convey are often difficult to realize due to budget constraints.

3.10. Role of Traditional Institutions

In the mapping in **Figure 6**, Customary Institutions are placed in the "Players" quadrant with a high-power score and high interest. In addition, as shown on **Figure 14**, analysis indicator the roe of local or traditional acehnese institutions they have significant influence that can shape and support the surrounding environment or community and regulations at the local level to play an active role in policy development and implementation.

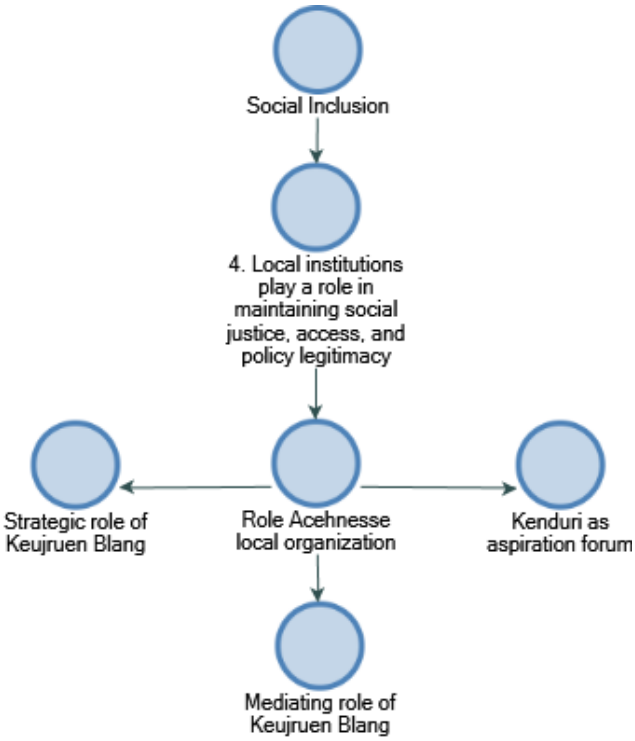


Figure 14. Local Institutions Role.

Processed by Author with NVivo12, 2025.

The interview with KJB, the head of the Nagan Raya customary institution, mentioned the role of customary institutions in completing agricultural program planning and supervision, for example by making them mediators in agricultural land disputes and ensuring that the rights of indigenous peoples are protected in every new policy. Their role also comes into play as a bridge during agricultural program evaluations, which are usually held during *Kenduri*[52] (a traditional ceremony to express gratitude after the harvest) There are four traditional activities involving various stakeholders, namely Kenduri Blang, Kenduri Lemang, Kenduri Ie Bue, and

Kenduri Padee (Post-Harvest Thanksgiving). These four activities are attended by traditional leaders such as Keujruen Blang, as well as representatives from the government and farmer groups.

4. Discussion

4.1. The Issues and Challenges

Through analysis by integrating stakeholder mapping and inclusive policy development indicators in Nagan Raya, the findings of this research reveal issues and challenges that need to be addressed, as outlined in **Figure 15** below:

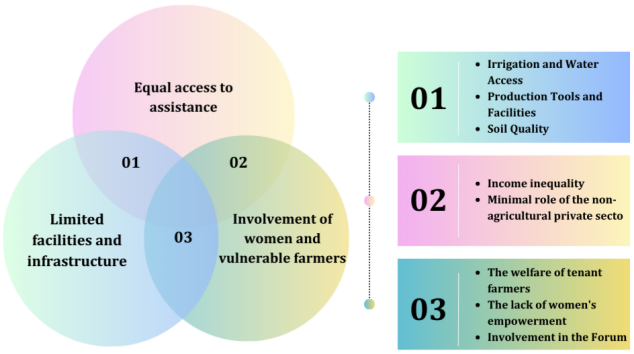


Figure 15. Classification Issues and Challenges Agricultural Sector In Nagan Raya Regency.

Processed by Author, 2025.

Referring to the Venn diagram in **Figure 15**, the three main challenges in developing inclusive agriculture in Nagan Raya District are: (1) equal access to assistance, (2) limited facilities and infrastructure, and (3) the involvement of all farmer groups, including smallholder and women farmers, which are closely interrelated and inseparable, so that problems in one aspect will have an impact on other aspects. First, the difficulty of creating equal access to assistance is often influenced by limited facilities and infrastructure. For example, the distribution of fertilizers, seeds, and agricultural production facilities can only reach areas with adequate water and road access. This condition causes farmer groups in areas with limited infrastructure to lag behind in taking advantage of government programs. Second, limited facilities and infrastructure also have a direct impact on the involvement of smallholder farmer groups and women farmers. Irrigation problems and a lack of production facilities make it increasingly difficult for them to actively participate in agricultural activities. This situation can exacerbate income inequality if not addressed immediately, especially for tenant farmers and farm workers who do not own their own land. Third, the low participation of women and smallholder farmer groups further widens the inequality gap. In several agricultural evaluation activities, women's voices tend to be accommodated and they do not have the opportunity to participate in decision-making [53], so their voices are not heard in the planning and distribution of assistance.

Statistical data from the Central Statistics Agency (BPS) in 2022 states that women in Indonesia account for around 25% of the total number of farmers, or around 34 million people [54] (p. 10). Nevertheless, women farmers face significant resource gaps compared to male farmers. Based on data from the 2018 Inter-Census Agricultural Survey, female farmers on average only control 0.2 hectares of land, less than half the area controlled by male farmers, which is 0.6 hectares. In the context of agriculture in Nagan Raya, women's position as actors in decision-making is only 16.6% of all actors and they are only involved as supporting actors.

In fact, when the involvement of these groups is minimal, the effectiveness of aid distribution and the ability to utilize available infrastructure can affect their agricultural activities. Thus, the issues of access to assistance, infrastructure, and participation of all agricultural groups, including smallholder farmers and women farmers, cannot be resolved partially, but must be approached in an integrated manner. Efforts to improve equal access must be accompanied by the development of basic infrastructure, as well as capacity building and representation of marginalized groups so that the goal of inclusive agriculture can truly be achieved.

4.2. The Impact of United States Import Tariff Policies on the Reduction of Indonesian Farmers' Welfare

The Dynamics of Economic Growth in Indonesia, particularly trade, has a fairly close economic relationship with the United States [55] (pp. 2, 3). Various sectors such as agricultural products, textiles, and electronics

are among Indonesia's main export destinations to the US, which influences economic growth in Indonesia [56] (p. 177). A report by the World Bank in 2022 shows that exports contribute 20% of Indonesia's GDP, which also plays a role in driving job creation. In the agricultural sector, exports to the US can contribute to poverty alleviation and rural development [56] (pp. 177, 178). In April 2025, the potential for major challenges related to the import and export of goods became a serious topic of discussion when US President Donald Trump announced plans for protectionist policies against imported goods from the European Union and Asia, including Indonesia. The US imposed a 20% tariff on imports from the European Union, 34% on Indonesian goods, 20% on Vietnamese products, and 36% on Thai goods, with China facing the highest tariff of 245% [57] (pp. 656, 657). Due to the relatively high import tariff of 34% imposed on Indonesia, negotiations were held and the US import tariff on Indonesian goods was set at 19% in August 2025 [58]. This is not comparable to the 0% tariff on US products entering Indonesia. This increase in import tariffs could trigger a decline in the volume of Indonesian product exports to the US. The tariff increase could also result in a larger trade deficit, given Indonesia's dependence on its bilateral trade relationship with the US [59].

The worst-case scenario of this change in US trade policy could be a key factor affecting Indonesia's economic stability in the medium and long term [57] (p. 657). This could also lead to an increase in poverty and a decline in farmers' welfare due to a decrease in export volume, which could affect the production and welfare of Indonesian farmers and, in turn, influence the decisions of farming communities, traditional institutions, and policy-making institutions to develop or formulate agricultural policies [60]. Although a report from the Indonesia Statistics Agency (BPS) states that in 2020–2021 the agricultural sector will contribute 24.6% of the main sectors providing employment, equivalent to 35 million of the 140 million workers in Indonesia [61] (pp. 50, 51), the US's policy of increasing import tariffs could trigger serious economic challenges in terms of trade value and agricultural inflation, with exports falling by up to 18% [58]. In addition, rice, as a staple food in Indonesia, also faces challenges related to insufficient supply to meet the needs of Indonesia's 270 million people, which is being addressed by importing rice from Vietnam in 2021 [62].

These import efforts add to the list of challenges facing Indonesia's agricultural sector, particularly the welfare of farmers. This is because grain prices and agricultural productivity may decline if the country's rice reserves come from imports [62] (p. 6). Furthermore, these import efforts may also put pressure on the budget that should be used to support local agricultural production, which could lead to other problems such as the emergence of budget efficiency policies in February 2025 [63]. To overcome several potential economic challenges in the agricultural sector, Indonesia's agricultural productivity needs to be developed and improved as an effort to store agricultural supply reserves to cope with the worst-case scenario of a decline in exports and imports [60]. As a supplier of agricultural products, the development of inclusive agricultural policies in Nagan Raya Regency is essential so that all farmer groups have equal access and opportunities to develop agricultural products and increase crop productivity. The simultaneous planting program mentioned in the LP2B also needs to be implemented evenly so that Nagan Raya's local agricultural products can serve as a supplier of rice as a food security reserve.

4.3. Policy Recommendations for Inclusive Agriculture Development in Nagan Raya District

4.3.1. Limitations of Infrastructure and Facilities

Based on the provisions of Qanun Aceh Number 2 of 2022 Article 17 which concerning LP2B (Sustainable Food Agricultural Land) [64], each agricultural program directed at LP2B land must consider [65]:

1) The availability of facilities and infrastructure (irrigation or water, agricultural machinery, and production support facilities) to maintain high productivity.
2) Local institutions (such as Keujreun Blang, P3A/GP3A) as participatory actors in regulating irrigation and simultaneous planting mechanisms.

3) Integrated planning through RPJMA/RPJPA so that irrigation, mechanization, and soil laboratory policies are in line with LP2B protection.

In line with this regulation, limitations in facilities and infrastructure, particularly access to water and agricultural equipment and machinery, can be accommodated with the following policy recommendations:

1) Revitalization of Jeuram Irrigation: To ensure water availability for agricultural land in Nagan Raya, the rehabilitation of Jeuram Irrigation is focused on priority plots. Improvements to irrigation network infrastructure use a labor-intensive approach to create local jobs. Water management (O&P) is carried out in a participatory manner, involving P3A (Water User Farmers Association) [66]/GP3A (Water User Farmers Association Association) and Keujreun Blang in drafting water rotation rules to ensure fair and efficient distribution.
2) Establishment of Agricultural Machinery Centers in Nagan Raya subdistricts: local governments can establish Agricultural Machinery Centers at the subdistrict level that offer affordable rentals of agricultural equipment such as tractors and combine harvesters. Priority is given to LP2B farmer groups that follow the simultaneous planting schedule. A lease-purchase scheme through cooperation with rice mills is also implemented to ensure the sustainable availability of equipment.

The implementation of activities in the simultaneous planting program will also need to involve the farming community. One of the recommendations proposed for the development and efficiency of the simultaneous planting program is Simultaneous Planting Scheduling based on the Water Calendar, which is based on irrigation discharge data and agricultural machinery readiness. Keujreun Blang acts as the field coordinator to ensure synchronization of planting schedules between LP2B plots.

4.3.2. Equal Access to Assistance

Agricultural assistance in Nagan Raya is directed to be targeted, transparent, and inclusive, with priority given to reaching vulnerable groups (women, farmers, land tenants), especially in LP2B areas. This principle is in line with the LP2B Qanun, which emphasizes justice, participation, and strengthening local institutions as the basis for policy implementation. Furthermore, recommendations for inclusive policy development that can be pursued include:

1) Distribution of Assistance Based on a Simultaneous Planting Calendar: Assistance for farmers will be distributed based on the simultaneous planting calendar stipulated in the Qanun [67], thus making it more effective and timely. Aid packages covering seeds, fertilizers, and land cultivation services will be distributed before the cultivation period begins. This approach ensures that farmers receive the support they need at the most crucial time in the production cycle, directly supporting increased crop yields.
2) Harvest Purchase Partnership: This partnership involves Bulog, Nagan Raya's partner rice mills, and farmer groups to absorb the harvest at a locally agreed floor price during the simultaneous harvest. This scheme not only ensures that farmers' harvests are absorbed, but also protects them from detrimental price fluctuations. The government can also provide fiscal incentives or Corporate Social Responsibility (CSR) to offtakers (mills or large traders) who consistently absorb grain or rice from LP2B land. Thus, farmers gain income certainty, while offtakers have access to a supply of quality rice. This policy reinforces the principles of benefit and fairness in the Qanun, creating a more stable and profitable agricultural ecosystem for all parties.

4.3.3. Involvement all Farmers Include Women and Vulnerable Farmers

In order to accommodate the involvement of women, inclusive policies must focus on capacity building, institutional strengthening, and affirmative regulations. Recommendations for inclusive policy development that can be pursued include:

1) Quotas for Representation in Forums and Institu-

tions: Women in Aceh province generally take on roles that require precision and patience[68] (p. 686), such as sowing seeds, weeding, or sorting crops. Meanwhile, men are more involved in activities that require physical strength, such as land cultivation and agricultural infrastructure maintenance. In line with the implementation of affirmative action in the involvement of women in institutions or government[69], the government can set a 30% representation quota for women and tenant farmers in every decision-making forum. This policy ensures that their voices are heard in various important meetings, such as the Keujreun Blang Forum, farmer groups, and Musrenbang (development planning meetings). To support this participation, the government will provide relevant leadership and technical training, such as irrigation management, group finance, and the use of agricultural machinery.

2) Women Empowerment's Trainning: according to Article 1 point 6 of Government Regulation No. 54 of 2004 concerning Women's Empowerment, women have great potential in various fields, including social, economic, political, educational, and other fields[69]. The Nagan Raya government can collaborate with the Women's Empowerment Agency, one of which is the Community, Village, Population Control and Women's Empowerment Agency (DPMGP4) to design special training programs for women farmers to improve their technical and managerial skills, as well as provide special funding allocations for women farmer groups. This is done because of farmers.

As a further action and effort to support sustainable agriculture programs, the following is a program implementation scheme based on the proposed policy recommendations for inclusive agricultural development in Nagan Raya for the next 5 years (2025–2029) on the **Figure 16** below:

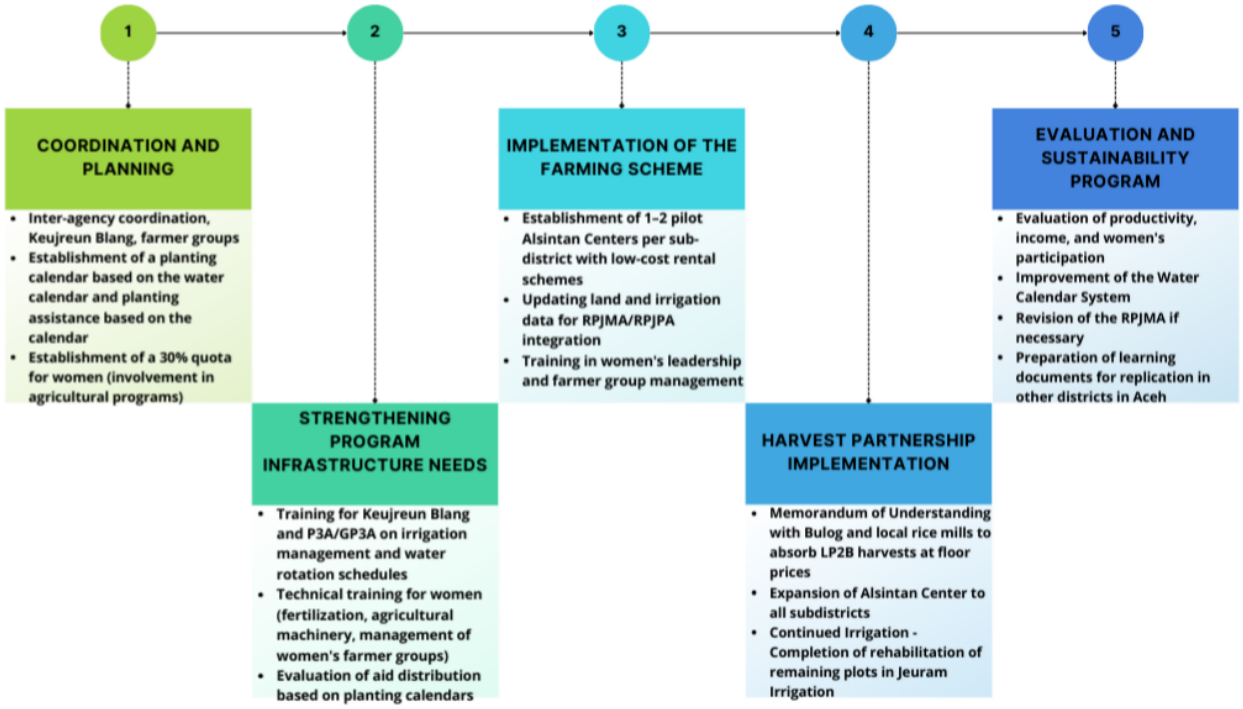


Figure 16. Proposal for Realization of Recommendations for Inclusive Agricultural Policy Development in Nagan Raya (2025–2029).

Processed by Author, 2025.

Based on **Figure 16**, the five-year program implementation plan is designed to address key structural, social, and economic barriers in the agricultural sector and the representation of women's participation. This

roadmap is developed in stages based on urgency, aiming to create an inclusive, productive, and resilient agricultural system. The annual project focus details are as follows on **Table 4** below:

Table 4. Table of Realization Stages of Proposed Agricultural Policy Development in Nagan Raya Regency 2025–2029.

Years	Targeted Project	Action
2025	Irrigation and Agricultural Infrastructure in Nagan Raya	1. Mapping and repairing irrigation channels by conducting irrigation condition surveys, rehabilitating damaged channels, and building supporting water infrastructure in critical areas. 2. A simultaneous planting program will be carried out in stages to accommodate water needs in each sub-district 3. Providing adequate basic production tools and facilities for farmer groups, including smallholder farmers and women farmers, not only farmers who own land but also tenant farmers. 4. Holding regular meetings and joint training sessions to develop annual work plans and integrated planting calendars between the government, Keujruen Blang, and farmer groups.
2026	Women Empowerment Role	1. Conduct training and empowerment of women farmers, including training in the use of agricultural machinery. 2. Ensure equal access by recording women farmers who need access to assistance 3. Involve women in forums for decision-making on agricultural activities during program evaluation meetings
2027	Management and improvement of agricultural land productivity	1. Conduct pest control training for farmers (both male and female) in the production of organic fertilizers, biopesticides, and crop rotation techniques. 2. Facilitate the formation of 2-3 pilot clusters that adopt environmentally friendly agricultural technologies focused on sustainable agriculture
2028	Improving Welfare and Non-Agricultural Partnerships	1. As an attempt to reduce income inequality, the Nagan Raya Government can support the establishment of small businesses initiated by women farmers, such as crop processing, agrotourism, or handicrafts. 2. Establish partnerships with Village-Owned Enterprises (BUMDes) or microfinance institutions to provide unsecured loans to women's farmer groups.
2029	Measure overall impact, make adjustments, and develop sustainability strategies.	1. Undertake a comprehensive evaluation with post-project surveys, data analysis, and stakeholder interviews to measure changes in productivity, income, and participation. 2. Establish a system of contributions from farmer groups for infrastructure maintenance and training activities to foster financial independence.

5. Conclusions

The development of inclusive agriculture in Nagan Raya Regency necessitates understanding the structural, social, and economic challenges that undermine progress. Key stakeholders, such as local agricultural authorities, traditional organizations (like Keujreun Blang), private mills, and farmer associations, have a significant impact and interest, but there are also less effective coordination with less active groups, such as small farmers, land tenants, and specifically women. Analyses of growth indicators show that programs such as simultaneous planting cycles have been successful in ensuring stable rice yields and market prices, but they have been hindered by poor water infrastructure, unreliable agricultural machinery, unreliable government distribution, and unsatisfactory female participation. There was a need for systemic and integrated solutions that went beyond simply providing technical solutions, such as revitalizing irrigation systems or establishing machine centers, but also addressed social issues, such as quotas for individuals in decision-making forums, targeted training programs, and transparent distribution systems. The implementation of the five-year action plan is prioritized based on the need to develop a productive, equitable, and resilient agricultural system

in Nagan Raya in a structured manner.

Author Contributions

Conceptualization, N.M. and A.P.; methodology, P.K.S. and S.; software, N.S.; validation, N.M., P.K.S., and A.P.; formal analysis, P.K.S. and N.M.; data investigation/collection, N.M., P.K.S. and A.P.; data curation, A.P.; writing—original draft preparation, A.P. and A.D.R.M.; writing—review and editing, N.M. and N.S.; visualization, N.S.; supervision, N.M., A.D.R.M. and S. All authors have read and approved the manuscript version to be published.

Funding

This research was funded by the Ministry of Education, Culture, Research, and Technology through the 2025 Regular Basic Research Scheme with Master Contract Number 117/C3/DT.05.00/PL/2025 and Subcontract Number 22/UN59. L1/AL.04/PL/2025 dated June 30, 2025.

Institutional Review Board Statement

Not applicable.

Informed Consent Statement

Not applicable.

Data Availability Statement

The data collected for this research primarily comprised first-hand data, obtained through direct interviews with farmers in Nagan Raya, representatives of the Aceh Government (including BAPPEDA and the Department of Agriculture), as well as private sector stakeholders. The data collection process employed triangulation of methods, namely: (1) field observation of the agricultural sector in Nagan Raya, (2) semi-structured interviews using a purposive sampling approach to identify key informants, and (3) documentary analysis drawing upon regional regulations, Qanun, LP2B, and relevant scholarly literature.

Acknowledgments

Thank you to the Rector of Teuku Umar University, the Head of the Teuku Umar University Research and Community Service Institute, the Dean of the Faculty of Social and Political Sciences, and the Head of the State Administration Study Program at Teuku Umar University for the trust they have placed in us. Thank you to the Regional Development Planning Agency of Nagan Raya District, the Agriculture and Livestock Service of Nagan Raya District, the Agricultural Extension Officer of Kuala Subdistrict, the Customary Institution of the Subdistrict, the Farmers' Community of Nagan Raya District, and all parties who have assisted with the research process from start to finish. This research is the result of a Regular Fundamental Scheme research project funded by the Ministry of Education, Culture, Research, and Technology in 2025 with the Main Contract Number: 117/C3/DT.05.00/PL/2025 and the Subcontract Number: 22/UN59.L1/AL.04/PL/2025 dated June 30, 2025.

Conflicts of Interest

The authors declare no conflict of interest.

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