Journal of Governance and Public Policy
ISSN: 2460-0164 (print), 2549-7669 (Online)
Vol 9, No 2 (2022): Page no: 137-147

Sustainable Agricultural Policy Strategies to Support Subsistence Agriculture in Lingga Regency

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Article Info

Article History;
Received:
2021-12-26
Revised:
2022-03-22
Accepted:
2022-04-01

Abstract: The production of subsistence farmers dominates Lingga's agricultural commodities as an alternative food supply. However, this production helps meet food needs in Lingga Regency. Along with the development of regional development, to meet the needs and regional food security and guard against land conversion activities, it is necessary to protect agricultural land. This article aims to identify the implementation of the Sustainable Food Agricultural Land Protection Program in Lingga Regency, Riau Islands Province. This research is a qualitative study with a study approach that examines the government's efforts to overcome land conversion and support the productivity of subsistence farmers as alternative food suppliers by making policies to protect agricultural land for sustainable food. Research shows that to anticipate the occurrence of land conversion, the local government of Lingga Regency issued two regulations to ensure the protection of sustainable agricultural land and the determination of the area of rice fields. This study still has limitations, namely respondents for primary data sources, especially in farmer groups. As a result, additional research will be conducted to include subsistence farmers and monitor the policy progress of the sustainable Food and agriculture land conservation program in Lingga Regency.

Keyword: *Policy; Sustainable Agricultural; Subsitance Agriculture.*

DOI: https://doi.org/10.18196/jgpp.v9i2.14301

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INTRODUCTION

The land area of Lingga Regency, which tends to be agricultural and plantation land in 2008, was 78,232 hectares. Agricultural land potential consists of 2,250 hectares of paddy field, 46,112 hectares of plantation, and 29,870 hectares of agricultural land. In comparison, the existing condition of land that has been utilized is only 21,610 hectares consisting of 15,477 hectares of plantations and 6,133 hectares of agriculture. The remaining 56,622 hectares of land have not been used optimally. Availability of land in extensification of agricultural land is the main factor determining food self-sufficiency. The availability of land resources is needed to be sufficient and supported by the development of various efficient, sustainable production technologies. Currently, agricultural land, especially rice farming land, is shrinking, which can

become a severe problem for national food security. Rural poverty indicators can be seen from the reality of the increasing proportion of smallholders in the distribution of land tenure. Poverty is an urgent issue in food security since it limits the poor from accessing sufficient food, both quantity and quality, for productive and healthy life (Hanani, Sujarwo and Asmara, 2016).

In meeting the adequacy of agricultural food, Lingga Regency obtains the supply outside the region. If this condition continues, Lingga Regency can be vulnerable to a food crisis (Sekarrini et al., 2021). The conversion of agricultural land is one of the threats to food security and security achievement. So far, the conversion of agricultural land has not been balanced by developing agricultural land through marginal land.

To maintain the capacity of agricultural land, especially to develop the rice field program, the local government seeks to control if there is a conversion of rice fields. Also, they will protect and develop the potential of rice fields to produce food supply and fulfill local food needs. The agricultural sector in Lingga Regency gets help from the government in developing community agriculture since the tools (appropriate technology) used in the production process are provided by them. Hence, business development can run smoothly and extensively (Wijaya and Handrisal, 2021). Law No. 41 of 2009 concerning the protection of sustainable food agricultural land is the legal basis for local governments to maintain sustainable agricultural land in anticipating food crises. The Policy for the Protection of Sustainable Food Agricultural Land (PLP2B) will play an essential role in controlling the activity of changing the function of agricultural food land, especially paddy fields. Food security, both regionally and nationally, requires the availability of sufficient land to develop the agricultural sector optimally (Janti, Martono and Subejo, 2016).

The production results of these subsistence farmers are maintained even though they barely touch the commercial market area due to their marginalized condition and geographical constraints. However, farmers continue to produce to meet the needs of their farmers. Such economic behavior of farmers can be better understood as a unique phenomenon than predicted in standard microeconomic theory. People continue to use their labor in agriculture. Subsistence farmers make a significant contribution in providing regional food needs when climate change occurs, especially tidal waves and wind changes in the annual cycle occurring for 2 or 3 months, so the supply of food from outside the Lingga District, especially from Jambi, will experience problems because trading ships relatively choose to not sailing.

The Lingga Regency government has carried out its rice field printing program to overcome this problem so that Lingga Regency has food independence. However, legal certainty is needed to protect agricultural land, especially rice, so land conversion will not interfere. This article will look at how the strategy maximizes the agricultural policies to improve the welfare of farmers in the Lingga Regency.

LITERATURE REVIEW

Three important aspects in planning for future sustainability in agricultural development are multi-stakeholder participation, scenarios, and mapping. Multi-stakeholder participation, including people from different sectors of government and society, helps ensure that as many visions and interests as possible are considered in future development planning (Darrah et al., 2018). However, policy instruments require appropriate tools and methods for implementation and evaluation, and, to date, there is no agreement on what sustainable agriculture is and how it can be measured (El Chami, Daccache and El Moujabber, 2020). Sustainable agricultural and rural development is a fundamental social goal, leading to social welfare. The development of civilization to date has proven that applying the concept of sustainable development only through market mechanisms is ineffective (Gajos et al., 2017). Sustainable agriculture aims to balance the economic, environmental, and social aspects of agriculture, creating a sustainable agricultural system in the long term (Rose et al., 2019).

In general, in terms of aspects of national food security policies, it appears that food security is being developed towards the development of food availability that can meet the needs of all levels of society based on the utilization of the potential of existing local resources (Rahmanto and Hotijah, 2020). Building capacity for the food system works through the dedication of time, resources, and personnel, expanding local governments' capacity to engage

and support food-related policies and programs (Berglund et al., 2021). In this case, the local government anticipates under the national policy through the Protection of Sustainable Food Agricultural Land (PLP2B) policy, although the implementation is not fully running optimally. For example, a research (Anggalini *et al.*, 2020) in Gunung Kidul, Yogyakarta showed that the performance of policy implementation (PLP2B) was not optimal. Stagnation in planning and implementation activities also affects the performance of other activities. However, another study showed that Gunung Kidul consumed cassava as their staple food. This phenomenon implicitly showed that food security remains a significant problem the Indonesian government faces (Napitupulu & Murdy, 2016).

Meanwhile, in Bali, in a study conducted by Suharyanto et al., to increase the effectiveness of the implementation of PLP2B policies, it was necessary to consider differences in the level of perception of the policy by optimizing the role of members in farmer groups and innovator farmers accompanied by intensive and participatory socialization accompanied by local government commitments (Suharyanto, 2017). Therefore, the regional government needs to establish a policy for the protection of sustainable food agricultural land in a regional regulation on Regional Spatial Planning which is then derived into a regional regulation on the protection of sustainable food agricultural land. Thus, land conversion can be prevented, and agricultural food land can be developed into agricultural land. Perpetual agriculture will achieve self-reliance and food security (Rumiartha, 2021) and determine the land area for food security (Vijayakumaran and Nur Amalina, 2018).

RESEARCH METHOD

The strength of qualitative research is typically seen as theory elaboration and theory generation rather than theory testing (Reinecke, Arnold and Palazzo, 2016). The aim of building theories based on acts of disciplined imagination is not to represent observable facts or predict probable futures. Instead, the aim is to perform desirable futures by theorizing them (Gümüsay *et al.*, 2022). The method used in this study was a qualitative approach with descriptive analysis methods. Qualitative research is data collection in a natural setting to interpret the phenomena where the researcher is the crucial instrument (Anggito and Setiawan, 2018). The research was conducted in the center of agricultural production in Lingga Regency. Data collection was done by gathering secondary data from the regional apparatuses such as strategic plans and Lingga Regency in Figures 2020 and 2021. The researchers also enriched this research by digging into some books, journals, research results, and other information.

RESULTS AND DISCUSSION

Guaranteed Protection of Sustainable Agricultural Land

The government's role in sustainable land management aims to protect agricultural land for food security and take sides with farming communities. An example is a case in Montenegro, how the state's political will and institutional capacity manage the lands (Coenen, Newig and Meyfroidt, 2022) so that no land conflicts exist due to investments such as in Ethiopia (Eneyew *et al.*, 2022) or losses in Bulgaria due to land reform and structural changes in agriculture (Hanaček *et al.*, 2021).

Development policies that emphasize economic growth through investment from investors in the provision of land conversion of agricultural land to non-agricultural functions are increasingly widespread. Development does not only aim to encourage economic growth but the food sector must be prioritized because it involves the rights of all communities to achieve the agricultural land aspect in maintaining harmony and balance between public interests and individual interests. Therefore, it is necessary to guarantee agricultural land protection from the community's government. The government has issued several regulations to protect agricultural land based on the 1945 Constitution. One of the objectives of protecting sustainable food agricultural land is to improve the welfare of farmers and the community as contained in Law Number 41 of 2009 concerning Protection of Sustainable Food Agricultural Land.

The local government's commitment and consistency in protecting sustainable food agricultural land by issuing Regent Regulation Number 96 of 2018 concerning Guidelines for implementing Sustainable Food Agricultural Land Protection in Lingga Regency. Not only that,

but the local government also issued Regent Regulation Number 64 of 2020 concerning the Determination of Raw Rice Field Areas in Lingga Regency in 2020. The issuance of these two regulations will guarantee the protection of agricultural food land so that farmers feel guaranteed and optimistic about increasing agricultural productivity from potential land-use change.

In the Lingga Regency Spatial Plan 2011-2031, which is contained in the evaluation of the implementation of sustainable food agricultural land (LP2B) by the Directorate of Food and Agriculture, Ministry of National Development Planning Agency in 2015, the area of sustainable food agricultural land is 5,205.00 Ha while the area of raw rice fields is 149.00 Ha.

Table 1. Lingga Regency Rice Field Raw Land

Location		Use	Surface area
Districts	**Village**		
(1)	**(2)**	**(3)**	**(4)**
North Lingga	Linau	Ricefield	40,70
North Lingga	Big River	Ricefield	162,29
South Singkep	Resang	Ricefield	248,21
Coast Singkep	Carry on	Ricefield	29,17
South Singkep	Marok Kecil	Ricefield	70,26
East Lingga	Bukit Langkap	Ricefield	395,90
East Lingga	Kerandin	Ricefield	91,33
North Lingga	Bukit Harapan	Ricefield	68.64
Lingga	Panggak Darat	Ricefield	3,33
Lingga	Panggak Laut	Ricefield	2,16

Source: Development Planning Agency at Sub-National Level, 2019.

The Regent's Regulation Number 96 of 2018 concerning Guidelines for Sustainable Food Agricultural Land Protection in Lingga Regency is to protect agricultural food land sustainably, realize food self-sufficiency and sovereignty, increase the prosperity and welfare of farmers and the community and maintain ecological balance. Then it was reinforced again by Regent's Regulation Number 64 of 2020 concerning Determination of Raw Area of Rice Fields in Lingga Regency in 2020, which aims to accelerate the map of protected paddy fields to fulfill and maintain the availability of paddy fields to support regional and national food needs, control the conversion of paddy fields, which is overgrowing and empowering farmers not to convert rice fields. Sustainable Food Agriculture Land Protection (LP2B) policy in Lingga Regency is limited to land identification and data collection of objects, subjects, and land area and stimulus and incentive policies for farmers who use land according to its appointment and maintain the environmental sustainability. Then in the morning, the sustainable food agricultural land owner will be given a unique mark on the land certificate / SPPT.

Figure 1 shows that the Policy for the Protection of Sustainable Food Agricultural Land is regulated based on Law No. 41 of 2009. The local government adjusts it to the Lingga Regency Spatial Plan. The vision and mission of the regional head, as outlined in the Lingga Regency Medium-Term Development Plan 2016-2021, focuses on agricultural development with the Agrominapolitan program. Thus, the program must support by legal certainty in food independence and guarantee the protection of land conversion, supported by two regulations, namely Regent Regulation Number 96 of 2018 concerning Guidelines for implementing Sustainable Food Agricultural Land Protection in Lingga Regency and Regent's Regulation Number 64 of 2020 concerning Determination Area of Raw Rice Fields in Lingga Regency in 2020. The ultimate goal is to increase welfare for farmers and the community.

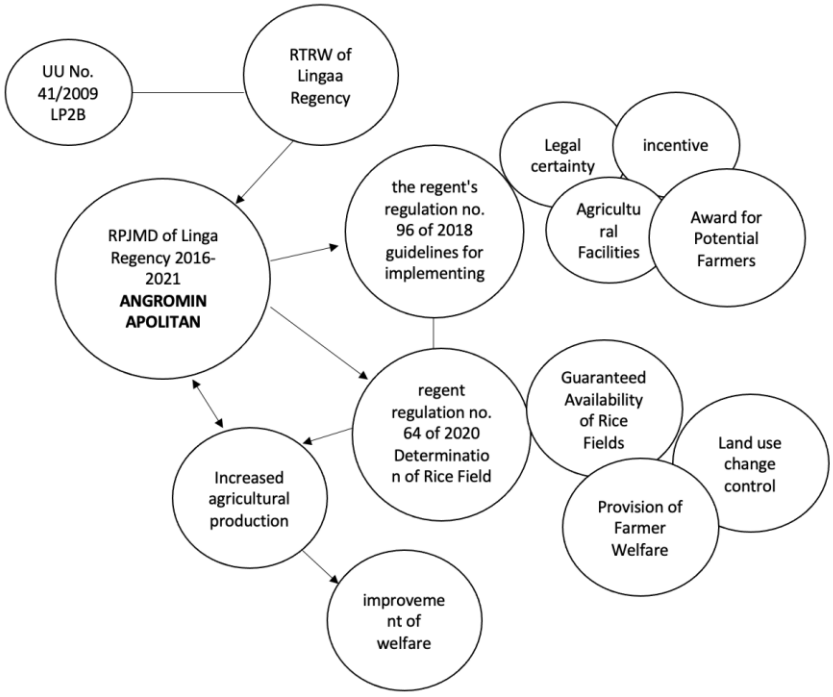

Figure 1. The Strategy of Sustainable Food Agricultural Land Protection Policy in Lingga Regency

Strengthening the Local Economy

Agricultural policies issued by the government do not fully address the expected needs. Suppose the main goal is the welfare of farmers. In that case, the most important aspect is to identify the causes of poverty, social and economic inequality, and the ongoing imbalance of agricultural development so that the welfare of farmers is still only rhetoric. In food access, it is clear that adequate food access for all community members is not carried out solely by the market. Rural and urban areas lack access to affordable food, among other foods. Limited food access is associated with poor diet and the prevalence of food-related diseases and exacerbates health disparities for low-income populations.

Especially for the case of the farming community in Lingga Regency as described above, although there are two categories of farmers (primary subsistence and secondary subsistence), the local government still pays attention to farmers even though the agricultural program in Lingga Regency cannot carry out optimally. The minimum action of the local government is to provide training, agricultural extension, fertilizer, and seeds.

An essential aspect of the culture of the agricultural community in Lingga Regency has always been relatively independent of the dynamic development of agricultural technology. Subsistence farming communities stick to traditional farming systems in cultivating land to process production. However, farmers do not solely rely on subsidies or other government assistance forms and can also develop their independence by orienting products based on market needs and competitiveness through creation and innovation.

Since promoting agricultural development in Lingga Regency, farming communities and non-farmers have been enthusiastic about developing agricultural innovations, such as growing hydroponic vegetables and building fertilizer production. The level of independence and potential of the community and agribusiness farmers can be optimal for agribusiness, which will help meet their standard of living welfare. The success of local economic development can look from several indicators:

1. expansion of opportunities for small communities in employment and business opportunities;
2. expansion for the community to increase income;
3. the empowerment of micro and small business institutions in the production and marketing process; and

4. institutional empowerment of partnership networks between the government, private sector, and local communities.

Especially in Lingga Subdistrict, Lingga Regency, local economic development starts from innovation in the village, and community empowerment activities are formed. At that time, the government saw much potential in the Lingga Subdistrict, which should have been developed into various kinds of products to have economic value, such as sorghum cultivation. Seeing the agricultural potential, the government carries out local economic development in Lingga District by looking at the agricultural potential in Lingga Regency and the community's food needs and agribusiness opportunities.

Table. 2 Potential Local Agricultural Products

No	Village	Groups of Farmers	Type of Agricultural Business
1	Bukit Langkap	Bina Sejahtera	Sorghum Cultivation
2			Organic fertilizer
3			Cayenne

Source: North Lingga Sub-district Office, 2020

Most of the population in rural areas depend on agriculture for their livelihood. The community in remote areas does not utilize much land, but land in a strategic area makes land expensive. In achieving food independence, it is necessary to reorient food production policies that focus on paddy fields for rice production and utilize all the potential of land with various food commodities.

In modern economic development and economic historiography, subsistence farmers react to market failures but never lead to market failures. These subsistence farming communities, either individually or in groups typical in the subsistence farming community, have primary economic relationships with farmers' reservoirs in the rural environment. Usually, in these areas are small reservoirs that buy farmers' products at low prices and sell them to the local community or bring them to the market.

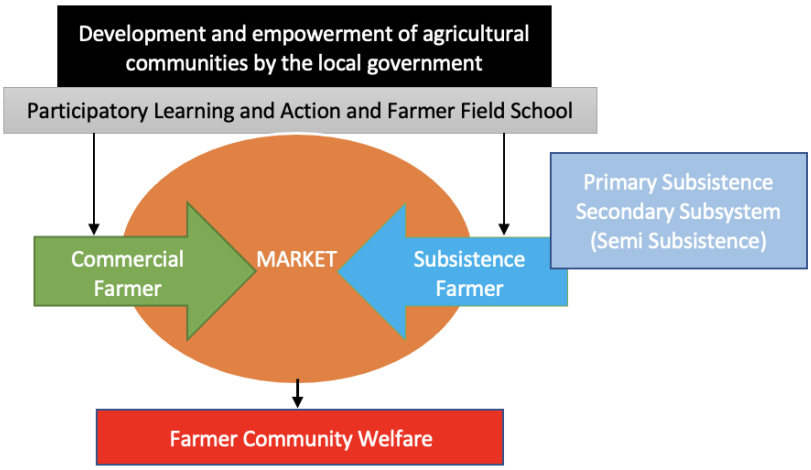

Figure 2. Agricultural Community Sustainable Empowerment Model

So regardless of the production of subsistence/semi-subsistence farmers or commercial farmers, these alternative options produce the food needed in Lingga Regency to prevent regional food insecurity. Then the production of local farmers can function to market agriculture with low transportation and marketing costs to provide the best cost savings and become a supply for all consumers under certain conditions.

Efforts by local governments to encourage subsistence farming communities to commercial patterns are indeed not easy because they require budgetary and regulatory support. Lingga Regency does not have special arrangements in terms of agricultural development, especially the empowerment of subsistence farmers. Although the Lingga District

Government continues to strive to encourage agricultural development, one of which is how to accommodate the production of subsistence farmers and encourage subsistence farmers to commercial patterns, this has not been able to be done considering that the culture of the subsistence farming community is still consistent with what it has done in the past. Although the local government uses technology transfer to increase production, it does not run optimally because the subsistence farming community still tends to traditional cropping patterns. At least the local government facilitates production by providing fertilizer assistance, technical agricultural operations, and building agricultural infrastructure and other infrastructure so that farmers gain access to the sale of their products, which has been difficult due to geographical conditions.

The production of subsistence farmers is needed to support the scarcity of the food market. Even though the production pattern is traditional, the government must pay attention to the sustainability of the production and the entity of the farmers. As in Brazil, traditional people's livelihoods are protected by law to protect natural resources, respect and value their knowledge and culture and promote it socially and economically (Antunes *et al.*, 2019). So land tenure security is seen as a fundamental condition for increasing smallholder agricultural production (Singirankabo, Ertsen and van de Giesen, 2022). The agricultural development strategy in Lingga Regency will gradually move dynamically towards agribusiness development that the local government can drive through the provision of subsidies for agricultural production facilities, support for farming capital, strengthening farmer institutions, and providing village transportation, which is believed to be able to bring Lingga's agriculture to competitiveness in the Riau Island Province.

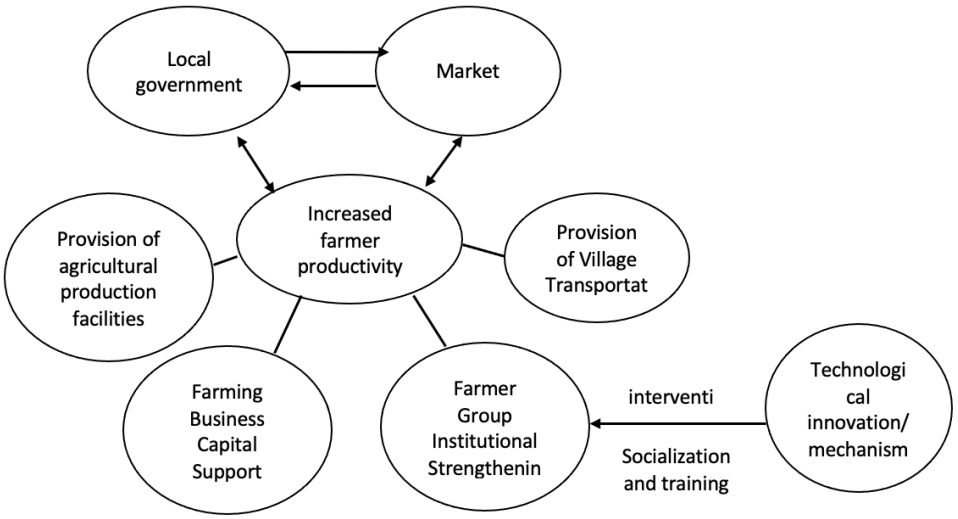

Figure 3. Local Agricultural Sector Development Strategy

Figure 3 reveals the role of local governments in agricultural development, especially traditional/subsistence farmers. Meeting the market and food needs in Lingga Regency do not only depend on supplies from other regions. Local governments can provide support through the four aspects: providing subsidies for agricultural production facilities, supporting farming capital, strengthening farmer institutions, and providing village transportation. Meanwhile, agricultural technology or mechanization cannot be applied directly but gradually or through the diffusion of agricultural extension innovations to farmer groups. Mechanization without prior socialization will be a barrier to production.

Table 3. shows the increase in harvested area, productivity, and rice production in Lingga Regency from 2016 to 2020. The increase occurred every year from the beginning of the program in 2016 until 2019. At the end of 2019, agricultural mechanization was to accelerate the increase in production. However, the yield decreased in 2020. The decline in harvested area and production was due to mechanization because farmers experienced difficulties adapting to the technology.

Table 3. Harvest Area, Productivity, and Rice Production by Year in Lingga Regency, 2016-2020

Tahun	Harvest Area (Ha)	Productivity (Ton/Ha)	Production (Ton)
(1)	**(2)**	**(3)**	**(4)**
2016	12,25	0,38	2,80
2017	22,25	0,50	11,05
2018	77,00	2,09	161,00
2019	133,00	2,80	373,35
2020	71,04	3,05	216,94

Source: Food Agricultural Statistics Report, Lingga Regency Central Bureau of Statistics, 2020.

From various kinds of research, the dynamics in implementing agricultural mechanization can compare with this research. For example, research from Waskitojati et al. revealed that in Southwest Sumba Regency, agricultural mechanization is the carry out by the Regional Government under the leadership of Regent Markus Dairo Talu, and there has been a significant increase in agricultural mechanization. The Southwest Sumba Regency Government implements an agricultural revolution policy by ensuring the availability of agricultural machinery (Alsintan) to increase agricultural production and ensure the sustainability of program achievements to attract subsistence farmers' interest in better agricultural patterns.

Handaka and Prabowo's research showed that the low level of farmer acceptance of agricultural mechanization, the high investment price of agricultural machinery, and several other social factors had caused a technical block to the application rate of agricultural machinery to support farming. The fundamental problem is that agricultural mechanization is not commensurate with the value of the investment, so the mechanization assistance project fails. Meanwhile, from Rizma Aldillah's research, agricultural mechanization to accelerate food production showed that farmers' performance in adopting technology was ineffective. It is necessary to strengthen farmer institutions and managers of agricultural machinery and other agricultural resources.

Meanwhile, in the case of subsistence farming communities in Lingga Regency, agricultural mechanization is relatively useless because it is not to the local community's land and socio-cultural conditions. So that efforts to implement agricultural mechanization need to consider the socio-cultural aspects of the community. The pattern of farming communities in subsistence agricultural production in Lingga Regency is relatively unable to be done with a technological approach. If there is uniformity of crops and agricultural patterns, for example, it can cause farmers to lose creativity and be less than optimal in producing agricultural products.

To change the farmer's perspective on technology transfer or agricultural mechanization, facilitators or extension workers need assistance in educating farmers using technology transfer adaptation strategies (Aidoo *et al.*, 2021). Farmer empowerment (Adam, Jin and Khan, 2022) and facilitator assistance may be required for years before the group becomes farmer-led and independent (Prager, 2022) (Ruml *et al.*, 2022). They are vital because it is a critical determinant of food security (Ingutia and Sumelius, 2022), resulting in a shift in understanding farmers' goals for new technologies (Ensor and de Bruin, 2022)

The geographical aspect is a barrier to the food supply in Lingga Regency. Geographical factors affect food market transaction costs (Fredriksson *et al.*, 2017) (Wąs *et al.*, 2021). Weather change factors and global climate change are also a threat to farmers (Li *et al.*, 2021) (Beitnes, Kopainsky and Potthoff, 2022) (Pasaribu, 2010) (Retnowati *et al.*, 2014). So it is necessary to adapt to climate change (Chepkoech *et al.*, 2020) and alternative food supplies from local farmers, mainly subsistence farmers.

CONCLUSION

In maximizing agricultural development efforts, strategies that can carry out for the development and empowerment of local agriculture, especially the subsistence farming community in Lingga Regency, are the provision of subsidies for agricultural production facilities, support for farming capital, strengthening farming institutions, and providing village transportation. Meanwhile, changing traditional agricultural patterns through technology cannot be done directly, considering the productivity of agricultural products produced so far has been

carried out using traditional patterns, and people are not familiar with agricultural mechanization. Policy efforts aimed at changing subsistence agriculture need to understand the determinants. Experience has shown that targeted change programs designed to reach farmers are unlikely to be optimal unless they are based on understanding farmers' values, culture, and motivations.

RECOMMENDATION

This research has limitations that need further research. The limitations include respondents for primary data sources, especially from farmer groups, and data collection. This research only processed data from regional development documents and existing regional policies and is the latest to support research data. So it is recommended for further research to complete by involving subsistence farmers as respondents and collecting data from secondary and primary data sources. Further research is recommended taking the scope of the sustainable Protection of Sustainable Food Agricultural Land Policy in Lingga Regency to see the developments and implications of the policies on increasing agricultural productivity.

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