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Analysis of the Development of Food Crops in Supporting Sustainable Agriculture in West Pasaman Regency

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ABSTRACT

The food crop subsector plays a crucial role in regional development by contributing to food security, farmer welfare, and rural economic stability. West Pasaman Regency, one of the main food production centers in West Sumatra, has significant potential but faces challenges such as productivity fluctuations, land conversion, and socio-economic issues among farmer households. This research, titled Analysis of the Development of Food Crops in Supporting Sustainable Agriculture in West Pasaman Regency, aims to identify the economic, social, and environmental conditions of the subsector and formulate holistic recommendations for supporting sustainable agriculture. The study employs secondary data analyzed descriptively, quantitatively, and qualitatively, using trend analysis and Shift Share to evaluate competitiveness. Results indicate that the food crop subsector in West Pasaman is projected to grow by 1.67% in 2024, higher than the provincial rate of 0.57%. The positive Competitive Effect suggests a local competitive advantage. However, unstable rice GDP and productivity, an increasing poor population, and ongoing land conversion remain threats to sustainability. Based on the analysis, strategic recommendations focus on three pillars: (1) economic—boosting productivity through eco-friendly technology, diversification, and downstream processing; (2) social—strengthening farmer institutions, regenerating agricultural labor, and ensuring food-based social protection; and (3) environmental—protecting productive land, conserving resources, and promoting sustainable cultivation practices. Overall, the development of the food crop subsector must adopt a holistic approach to enhance regional competitiveness and achieve sustainable development goals.

KEYWORDS *competitiveness, food crops, shift share, sustainable agriculture, West Pasaman*

INTRODUCTION

According to the Food and Agriculture Organization (FAO), approximately 828 million people worldwide were affected by hunger in 2021, with the prevalence of undernourishment reaching 9.8% globally (FAO, 2022). In Southeast Asia, food insecurity remains a pressing concern, with an estimated 60.5 million people experiencing moderate to severe food insecurity (FAO, 2023). The World Bank (2023) emphasizes that agricultural productivity enhancement and sustainable food systems are critical for addressing these challenges, particularly in developing countries where agriculture remains central to rural livelihoods and national food security. Currently, the world is facing numerous developmental challenges, as formulated in the Sustainable Development Goals (SDGs), where food security remains a top priority with the target “Zero Hunger” (SDG Goal 2) (Mechiche-Alami et al., 2021). The significance of this goal is underscored by projections that global food demand will increase by 50% by 2050 due to population growth and changing dietary patterns, necessitating substantial improvements in agricultural productivity and sustainability (World Bank, 2023).

Attention to the agricultural sector is essential to realize the SDGs. Agricultural innovation is the key to food security (Alhassan et al., 2026; Kolapo & Sieber, 2025). In the

future, various food challenges will emerge, positioning the food crop subsector in a strategic role for development. Food crops not only ensure food availability but also contribute to job creation, poverty reduction, and the maintenance of social and political stability (Food Security, 2023). This subsector represents one of the main pillars of food security and serves as a livelihood source for most rural communities (Fischer, 2019). Therefore, the development of the food crop subsector holds significant economic, social, and environmental importance.

West Pasaman Regency is one of the food production centers in West Sumatra Province with considerable potential for development. This potential is supported by the availability of vast agricultural land, abundant labor, and traditional communities that still rely heavily on the agricultural sector. However, the development of the food crop subsector in this region faces various challenges. Climate change affecting planting patterns and productivity, conversion of agricultural land to non-agricultural use, commodity price fluctuations, limited market access, low adoption of cultivation technology, and weak farmer institutions hinder the competitiveness of the subsector (Tola & Bachri, 2023; Wijaya & Amri, 2022). These conditions raise concerns regarding the sustainability of the agricultural system and the role of the food crop subsector in supporting the regional economy.

Various studies have examined the food crop subsector in Indonesia. Demeke and Marcantonio (2013) emphasized that this subsector continues to contribute significantly to national food security, although productivity tends to stagnate. Saadah et al. (2021) and Burhansyah et al. (2023) highlighted the importance of rice farming efficiency in improving farmers' welfare, while Khairad et al. (2018) and Sya'roni et al. (2024) found that the contribution of the food crop subsector to the regional Gross Regional Domestic Product (GRDP) remains substantial, though fluctuating. Meanwhile, Apoorva and Kundlas (2024) indicated that intensification strategies with excessive chemical inputs cause environmental degradation, and Trigo et al. (2021) emphasized the necessity of sustainable agriculture approaches balancing economic, social, and environmental aspects.

From the literature review, several research gaps can be identified. First, previous studies have mainly focused on economic aspects—such as production, productivity, and the contribution of food crop subsectors to GRDP—while their relationships with social and environmental aspects remain underexplored. Second, most research has been conducted on national or provincial scales, despite regional differences in characteristics, challenges, and opportunities. Specifically, in West Pasaman Regency, studies comprehensively examining the dynamics of the food crop subsector's development are still limited. Third, the perspective of sustainable agriculture has been rarely applied in food crop analysis. Many studies related to food security emphasize production and availability without adequately integrating ecological sustainability and long-term farmer welfare.

This research situates the development of the food crop subsector in West Pasaman Regency within the framework of *Analysis of the Development of Food Crops in Supporting Sustainable Agriculture in West Pasaman Regency*. First, this study extends previous research by not only focusing on economic contributions but also examining the social implications for farmers' welfare and the impact on environmental sustainability. Second, it fills the gap in local-level studies with a special focus on West Pasaman Regency, which has a strategic role but lacks in-depth research. Third, this study contributes to the sustainable agriculture literature

by linking the development of the food crop subsector with adaptive regional development strategies that respond to climate change, land conversion, and market dynamics. The purpose of this study is to identify the economic, social, and environmental conditions of food crops in West Pasaman Regency and to formulate holistic recommendations for sustainable agriculture.

This research not only provides an empirical overview of the current conditions of the food crop subsector but also presents a comprehensive analysis that considers economic, social, and environmental dimensions. The results are expected to enrich the scientific literature on sustainable agricultural development and provide strategic recommendations applicable to local government and relevant stakeholders. With this approach, the study aims to answer a fundamental question: How can the food crop subsector in West Pasaman Regency continue to develop while supporting sustainable regional development?

From this comprehensive literature review, several critical research gaps are reaffirmed. First, previous research has predominantly concentrated on economic aspects such as production volumes, productivity levels, and GRDP contributions, while the interlinkages with social and environmental dimensions remain insufficiently examined. This narrow focus limits understanding of the holistic sustainability challenges facing the sector. Second, much existing research operates at national or provincial levels, overlooking the unique characteristics, challenges, and opportunities of different regions. Specifically for West Pasaman Regency, systematic studies examining the development dynamics of the food crop subsector are extremely limited, presenting a significant knowledge gap for evidence-based policymaking. Third, the sustainable agriculture perspective—integrating economic viability, social equity, and environmental integrity—has not been widely applied in food crop analysis. Most studies on food security emphasize production and availability, lacking integration with ecological sustainability and long-term farmer welfare considerations.

This research positions the development of the food crop subsector in West Pasaman Regency within the comprehensive framework of *Analysis of the Development of Food Crops in Supporting Sustainable Agriculture in West Pasaman Regency*, addressing the identified gaps through several innovative approaches. First, it extends prior research by not only emphasizing economic contributions but also systematically analyzing social implications on farmers' welfare and environmental impacts on ecological sustainability, thereby offering a multidimensional perspective uncommon in existing literature. Second, it addresses the critical gap in localized studies by focusing on West Pasaman Regency, which plays an essential role in regional food security yet has received minimal scholarly attention. Third, this research contributes methodologically by integrating Shift Share analysis with sustainability assessment to identify both competitive advantages and sustainability vulnerabilities across economic, social, and environmental dimensions.

The specific objectives of this study are: (1) to comprehensively identify and analyze the economic, social, and environmental conditions of the food crop subsector in West Pasaman Regency during the 2020–2024 period; and (2) to formulate evidence-based, holistic, and actionable recommendations for sustainable agricultural development that integrate economic competitiveness, social equity, and environmental conservation principles. This research is expected to deliver significant theoretical, practical, and methodological contributions. Theoretically, it enriches sustainable agriculture literature through empirical insights into the multidimensional dynamics of food crop development in a regional context. Practically, it

provides strategic recommendations for policymakers and stakeholders to design interventions enhancing food security and sustainability. Methodologically, it introduces a replicable analytical framework that combines Shift Share analysis and sustainability assessment for broader application in other regions.

METHOD

This study employed a descriptive research design with a mixed-methods approach, combining quantitative and qualitative analyses to provide a comprehensive overview of the development of the food crop subsector. The research was conducted as a case study in West Pasaman Regency, West Sumatra, using secondary data collected over a five-year period from 2020 to 2024. The population consisted of relevant official records covering the economic, social, and environmental dimensions of the food crop subsector within the regency during the specified timeframe.

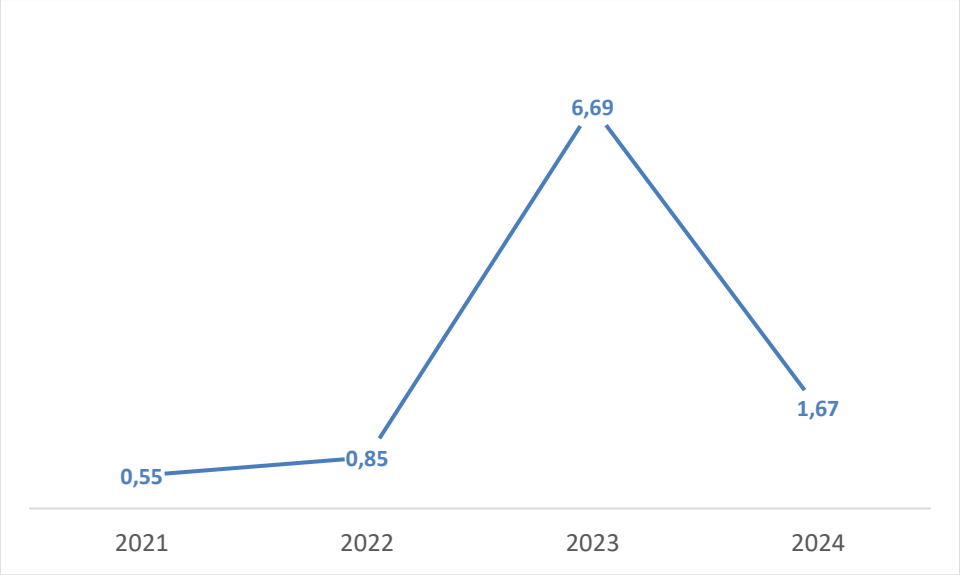
The data sample comprised pre-existing datasets obtained from official institutions, including information on harvest area, productivity, production volume, Gross Regional Domestic Product (GRDP) contribution, poverty rates, educational attainment, land use, and fertilizer application. The data were sourced from the Central Statistics Agency (BPS) of West Pasaman Regency and West Sumatra Province, the West Pasaman Regency Agriculture Office, the Ministry of Agriculture of the Republic of Indonesia, and other official publications. Purposive sampling was applied, as specific and relevant secondary data were deliberately selected from these authoritative sources to ensure credibility and alignment with the research objectives.

A structured data collection form was used to compile and organize the secondary data according to the defined variables across economic, social, and environmental dimensions. For data analysis, both quantitative and qualitative descriptive methods were applied to identify trends and conditions from 2020 to 2024. This was supported by Shift Share Analysis to decompose regional economic growth into national, industrial, and competitive effects and to evaluate the local competitiveness of the food crop subsector in West Pasaman.

RESULT AND DISCUSSION

Economic Conditions of Food Crops in West Pasaman Regency

The ability of the region to maintain its food is of course determined by the ability of the region to produce food crops. Likewise with the conditions in West Pasaman Regency, one of the measures that can be seen to describe the condition of food production in West Pasaman is the growth of the GDP of food crops, to see more clearly the picture of the GDP of food crops in West Pasaman Regency:



Source: Central Statistics Agency of West Pasaman (2025)

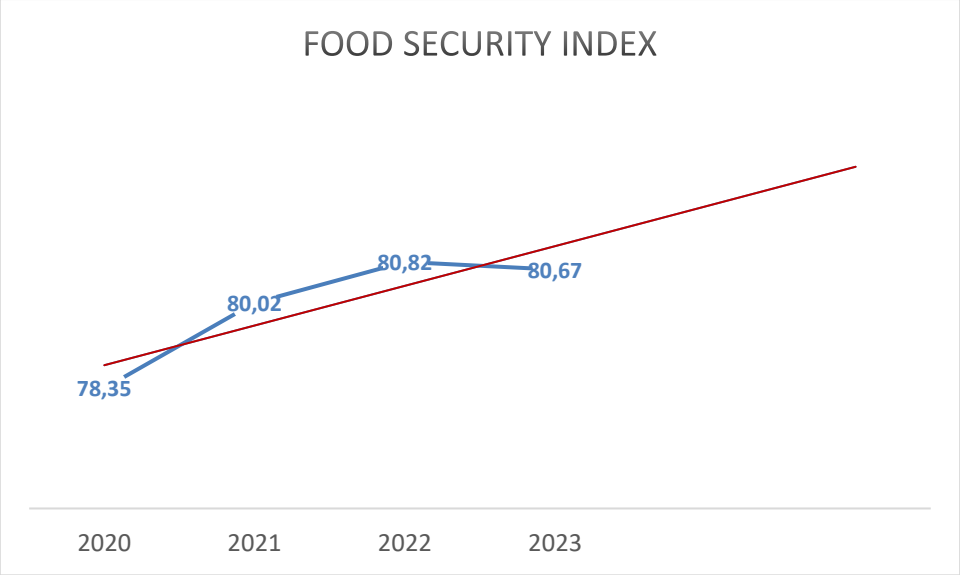
Figure 1. GDP Growth of Food Crops in West Pasaman Regency in 2021-2024 (%)

In figure 1, it can be seen that the ability of West Pasaman Regency in food crop production is a little concerning, this can be seen in the 2023 and 2024 tanhun. In 2023, the growth of GDP of food crops increased significantly from 2022 which was 0.85% to 6.69% but in 2024 it will also decrease significantly to 1.67%. This condition illustrates that the ability of food production in West Pasaman Regency is not stable, many factors certainly cause this condition as explained by (Tan et al., 2016) so far the food subsector in Indonesia is still facing productivity stagnation due to low technology adoption. If this condition occurs for a long time, it will have an impact on food security in West Pasaman Regency.

As it is known that when the ability to produce food crops decreases, it will result in limited availability of food crops, this condition will become a problem that causes food. As explained by (Freathy et al., 2024), vulnerability is related to an individual's access to food, not its production. When the amount of food production is low, access to food will be disrupted, which will result in economic inaccessibility (unaffordable food prices). This condition will be exacerbated if there is inflation. If viewed from the report of the Central Statistics Agency of West Pasaman (2025), in December 2024, there will be inflation in West Pasaman Regency of 0.37 percent. According to (Gahamanyi & Tchouassi, 2025) dynamic price changes or inflation can affect food security. The inflation rate is certainly not a happy condition for food security; it can sometimes be a problem that is often feared.

Food security is a complex and broad concept that encompasses various dimensions, including food availability, accessibility, utilization, and stability (Clapp et al., 2022; Pandey & Mishra, 2024). Food security also relates to conditions in which each individual has the physical, social, and economic abilities necessary to obtain an adequate, safe, and nutritious food supply, according to their nutritional needs and preferences. Global food security encompasses six fundamental elements, namely availability, accessibility, utilization, stability, resilience, and sustainability (Pandey & Mishra, 2024).

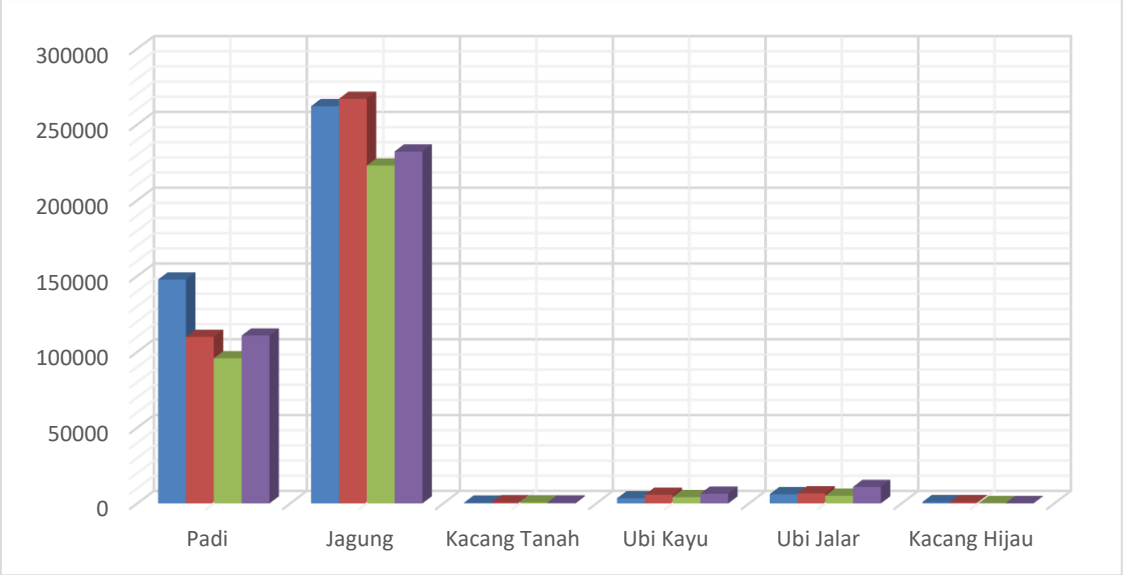
The following is the condition of the IKP of West Pasaman Regency.



Source: National Food Security Agency (2025)
Figure 2. West Pasaman Regency Food Security Index

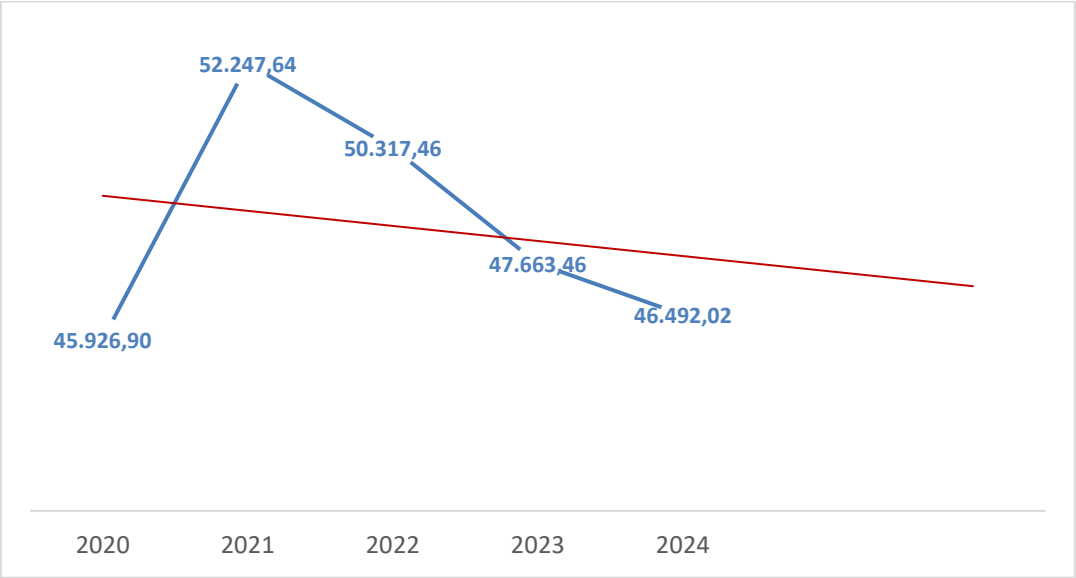
Based on figure 2 above, it can be seen that the trend of the food security index (IKP) in West Pasaman Regency shows an increasing trend. However, if examined more deeply, the condition per year in 2020 was 78.35, which means that currently the food condition in West Pasaman is quite good, in 2021 to 2022 the Food Security Index (IKP) of West Pasaman Regency has slowly increased to 80.82, this condition certainly shows the expected improvement, but in 2023 the food security index (IKP) in West Pasaman has decreased to 80.67.

This condition suggests that although most of the community's food needs can be met, food vulnerabilities remain, especially when there is a decrease in production or distribution disruptions. According to (Gahamanyi & Tchouassi, 2025) resilience is influenced by many factors, including economic conditions, agricultural productivity, and market dynamics. However, according to (Yue et al., 2025), basically food security is a condition that is very closely related to the production of food crops. The higher the food production, the better the region has food security, the following can be seen the production of food crop commodities in West Pasaman in 2020 – 2023 as follows



Source: Central Statistics Agency of West Pasaman (2025)
Figure 3. Food Crop Production in West Pasaman in 2020 – 2023 (Tons)

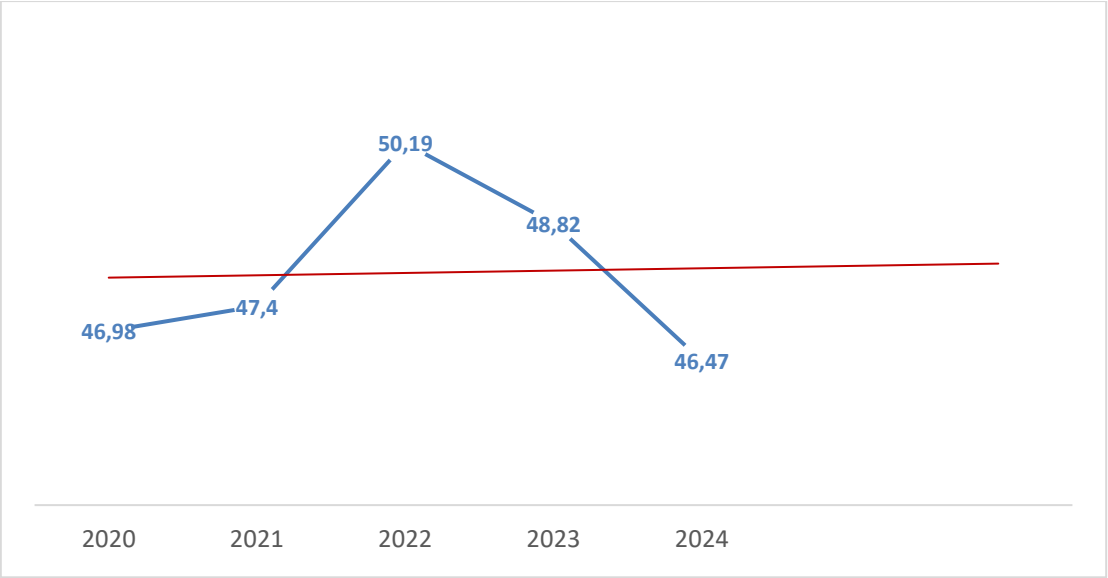
Based on figure 3 above, it can be seen that food crops in West Pasaman are dominated by rice and corn plants. This means that most of the existing food production is rice and corn. However, as a community, the staple food in West Pasaman itself is the rice plant. Next, you can see the rice production in West Pasaman Regency as follows:



Source: Central Statistics Agency of West Pasaman (2025)
Figure 4 Rice Production in West Pasaman in 2020 – 2024 (Tons)

Based on figure 4 above, it can be seen that so far rice production in West Pasaman Regency shows unpleasant conditions, this can be seen from the production that continues to decline even though in 2021 rice production increased by 52,247.65 tons from 45,926.90 tons in 2020. However, from 2022 to 2024, rice production is declining, which means that there are

problems in rice production in Pelalawan Regency. With the existing area of rice land, of course, the productivity of rice farming in West Pasaman can be seen as follows:



Source: Central Statistics Agency of West Pasaman (2025)
Figure 5 Rice Production in West Pasaman in 2020 – 2024

Based on Figure 5 above, it can be seen that so far the productivity of rice farming in West Pasaman is only 50.19% in 2022 and this is the highest amount of productivity in the period from 2020 to 2024, but in 2023 to 2024 it has actually decreased.

Data on rice production and productivity as the main commodity confirm this. Rice production had increased in 2021, but decreased in 2023–2024. Rice productivity, which had reached 50.19 ku/ha in 2022, also declined in the following years. This indicates that there are technical problems in cultivation as well as external challenges such as climate change that affect land quality and production yields. (Burhansyah et al., 2023) emphasized that the efficiency of rice farming is a key factor to improve farmers' welfare and ensure food security, so productivity fluctuations such as those that occurred in West Pasaman can be an indicator of weak efficiency.

Table 1. Analysis of Shift Share of Food Crops in Pasaman Regency

No	Component	Value (RP Million)	Interpretation
1	Total Change	15.502,04	Increase in GDP in the West Pasaman food crop subsector 2023–2024.
2	National Growth Effect	200.282,87	The growth is due to following the pace of the food subsector in West Sumatra.
3	Industry Mix Effect (IME)	-194.935,45	No influence of industrial structure
4	Competitive Effect (CE)	10.154,61	Additional growth due to higher local competitiveness.

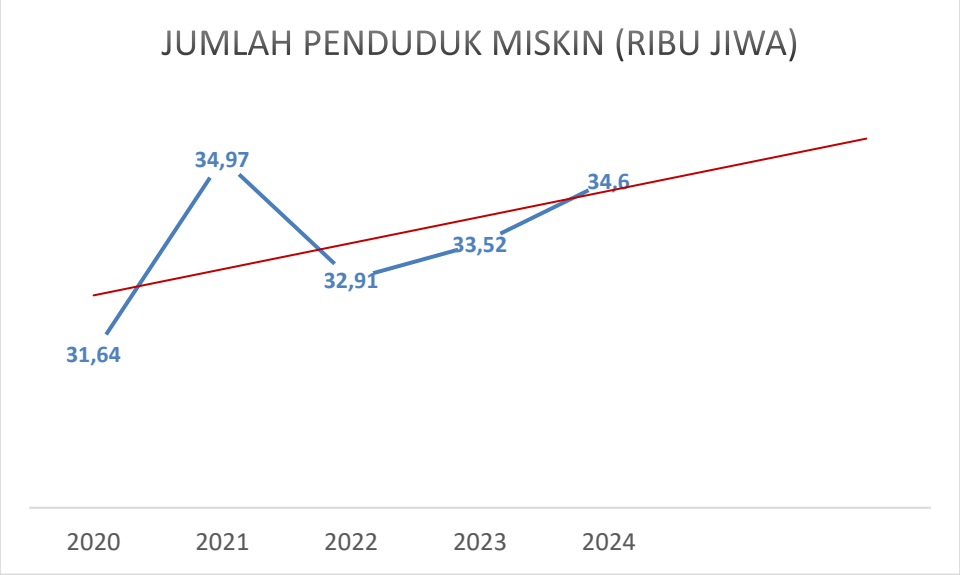
The results of the analysis show that the total growth of the food crop subsector in West Pasaman Regency is IDR 15,502.04 million. Of this amount, around Rp 200,282.87 million comes from the National Growth Effect (NGE), which is the contribution that occurs if West Pasaman Regency only follows the growth trend of the food subsector at the provincial level. However, the largest contribution came from the Competitive Effect (CE) of IDR 10,154.61 million, which indicates local competitiveness in the food crop subsector.

This positive Competitive Effect indicates that the growth of food crops in West Pasaman Regency is better than the provincial average. This can be attributed to factors such as relatively higher land productivity, better adoption rates of agricultural technology, regional policy support, and the existence of more solid farmer institutions.

These findings are in line with research (Montesclaros & Teng, 2021) which states that the food crop subsector still has a significant contribution to food security, although productivity in many regions tends to be stagnant. The fact that West Pasaman showed a positive CE indicates that there is greater development potential. Setiawan, (2018) also emphasized that farming efficiency, especially in rice, is the key to improving farmers' welfare. This is relevant to the condition of West Pasaman which is able to produce higher growth than the province. So that the things that need to be considered for the production of food crops, especially rice, are the planting structure and crop yields in the food production system, this was found by (Yue et al., 2025) where the planting structure for this plant will continue to develop along with the harvest obtained in the previous year

Another aspect that affects food security is the social aspect, one of which is poverty. Limited financial resources and low income levels limit an individual's ability to access and purchase adequate nutritious food. Therefore, they often face greater challenges in meeting their food needs (Pandey & Mishra, 2024).

The poverty condition of West Pasaman Regency is also quite concerning, for comparisons between West Sumatra provinces, West Pasaman Regency is the 4th highest. And also has a tendency to improve. For more clarity, you can see the following image:

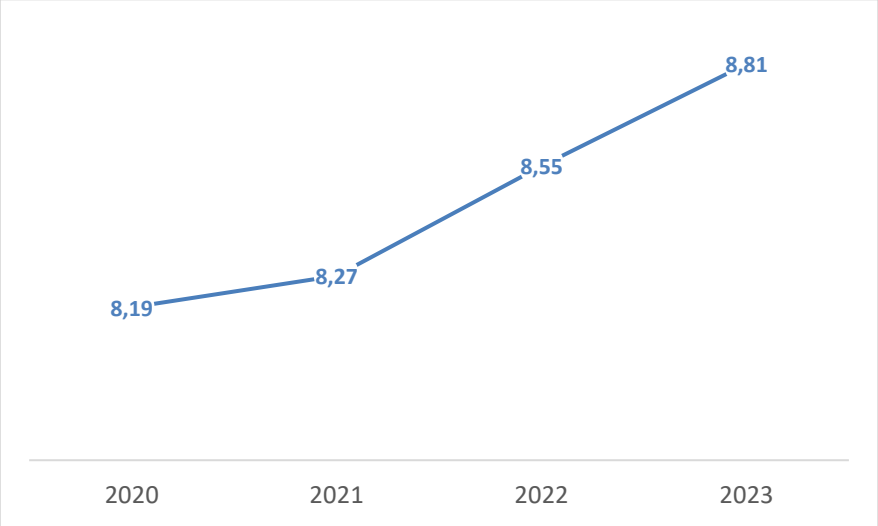


Source: Central Statistics Agency of West Pasaman (2025)

Figure 6 Number of Poor Population of West Pasaman Regency 2020 – 2024 (Thousand People)

In figure 6, it can be seen that the number of poor people has fluctuated, from 31.64 thousand people in 2020 to 34.97 thousand people in 2021, decreased to 32.91 thousand people in 2022, then rose again to 34.6 thousand people in 2024. This fluctuation is in line with the movement of the Food Security Index (IKP) showing a decline after 2021 and the poor population has increased. This means that the ability of households to meet needs has decreased. This condition certainly needs to be considered, if left unchecked, poverty in West Pasaman will worsen so that its ability to meet needs will increase. This condition is in line with Malthus' theory, which states that population growth has a direct impact on the availability of resources, especially access to food. Without simultaneous progress in agricultural productivity, such growth risks triggering resource scarcity and price inflation (Gahamanyi & Tchouassi, 2025).

The aspect of education is important in maintaining food security, this is because with good education, the ability to calculate food values, nutrition and indicators that determine food security will be better. The following can be seen the development of education based on the average length of school in West Pasaman Regency in 2020 – 2023:



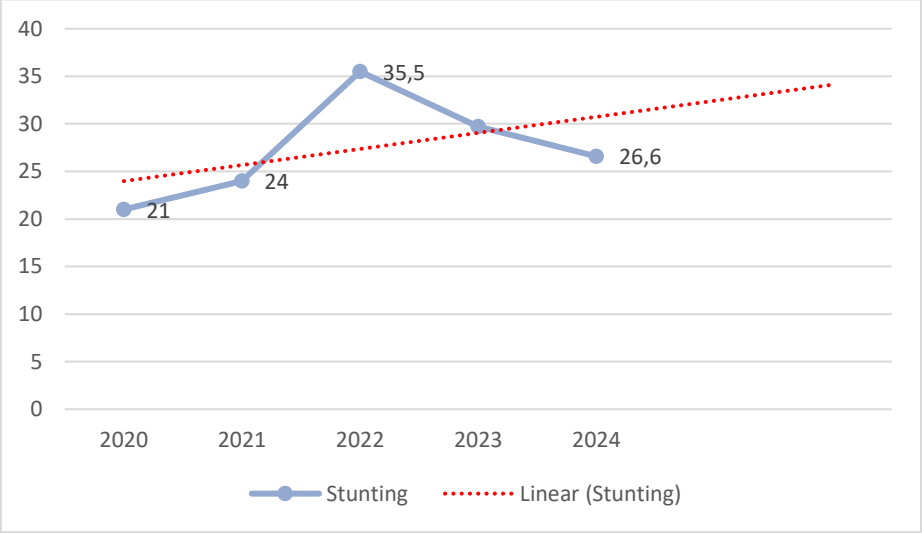
Source: Central Statistics Agency of West Pasaman (2025)

Figure 7 Education Conditions of West Pasaman Regency 2020 – 2024 (Thousand People)

Based on figure 7 above, it can be said that the development of education in West Pasaman Regency shows an increase meaning that education in West Pasaman Regency is getting better, where in 2020 education in West Pasaman will be 8.19 years increasing until 2023 to 8.81 years. The condition of education that continues to improve in West Pasaman is certainly contrary to food security. Good education is expected to be better able to manage food shortages.

The weakening of food security certainly has an impact on health conditions, one of which is the incidence of stunting, this is because the condition of stunting is related to the

nutritional status of toddlers which is a component that needs to be considered because it will affect human quality in the futureThe growth of toddlers is closely related to nutritional status (Mumtaza, 2024). However, when food security is low, nutritional conditions decrease, resulting in stunting. Looking at the state of food security in West Pasaman, the condition of stunting is an aspect that needs to be considered. The following can be seen stunting in West Pasaman:

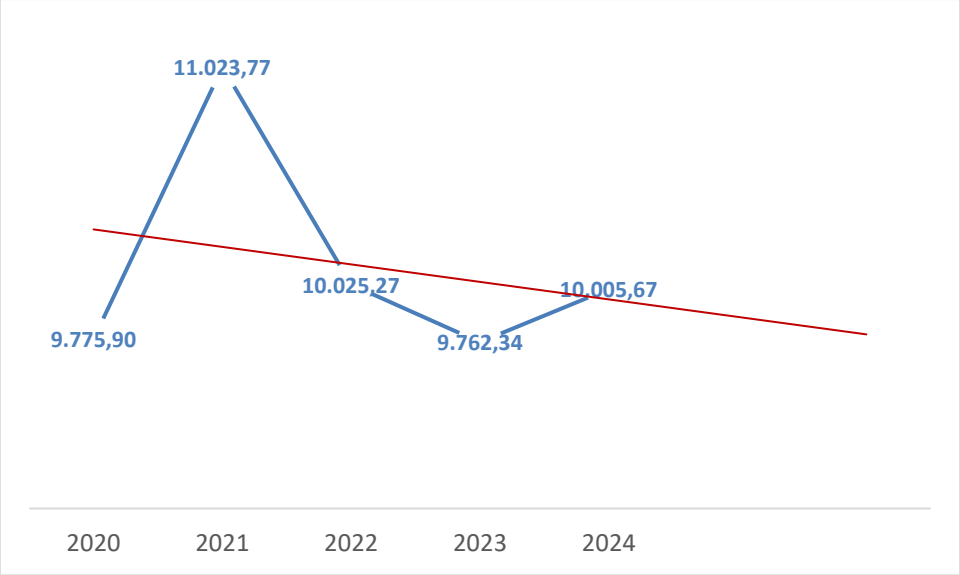


Source: Central Statistics Agency of West Pasaman (2025)

Figure 8 Stunting Conditions in West Pasaman Regency 2020 – 2024 (Thousand People)

In figure 8, it can be seen that the development of stunting conditions in West Pasaman shows a positive trend, meaning that the tendency is increasing. The highest stunting, which is in 2022 up to 35.5%, this condition is the highest in West Sumatra. This means that the issue of food security is very complex in West Pasaman, it is necessary to pay attention to efforts to maintain food security.

In addition, environmental aspects also provide an important overview in the analysis of the food crop subsector. The area of rice land in West Pasaman has fluctuated quite significantly, from 9,775.90 ha in 2020 to 11,023.77 ha in 2021, then decreased again to 9,762.34 ha in 2023, and slightly recovered to 10,005.67 ha in 2024. These fluctuations show that there is pressure on the availability of productive land, both due to land conversion and limitations in maintaining existing land productivity. In addition, the practice of cultivating food crops is still dominated by the use of chemical inputs. For this reason, it can be seen the development of the number of rice production land in West Pasaman Regency:



Source: Central Statistics Agency of West Pasaman (2025)
Figure 9 Condition of Rice Harvest Land in West Pasaman Regency 2020 – 2024 (Ha)

In the graph above, it can be seen the development of rice land area in West Pasaman Regency, where the tendency is actually declining, namely in 2020 the area of rice land was 9,775.90 hectares, increasing in 2021 to 11,023.77 hectares, in the following year showing conditions that tend to fluctuate which decreased until 2023 to 9,762.34 hectares but increased in 2024 to 10,005.67 hectares.

While it can increase yields in the short term, overuse has the potential to degrade soil fertility, reduce the quality of agricultural ecosystems, and threaten long-term production sustainability. Agricultural land is an important aspect in maintaining food security in an area, as explained by (Hegazi & Seyuba, 2024) that for people whose livelihood is agriculture, the amount of food agricultural land is a determining factor in maintaining food security. As explained by (Edafe et al., 2023), the larger the land, the more food security will increase. Likewise, (Mechiche-Alami et al., 2021) stated that the problem of food security will be solved when utilizing productive land for food crops

Strategic Recommendations for Sustainable Food Crop Development in West Pasaman Regency

Based on the results of the identification of economic, social, and environmental conditions of the food crop subsector in West Pasaman Regency, holistic recommendations can be prepared to realize sustainable agriculture. Economically, the food crop subsector has shown relatively good performance with a growth rate of 1.67% in 2024, higher than the provincial average. The Shift Share analysis also confirms that the contribution of the Competitive Effect is more dominant than the National Growth Effect, which means that West Pasaman has local competitiveness in the development of food crops. However, fluctuations in GDP growth and productivity that tend to decline indicate the need for a strategy to strengthen productivity based on environmentally friendly technological innovations, product diversification, and downstream agricultural products.

From the social side, the main challenge is the high number of poor people who fluctuate and the vulnerability of farmer households to price and production dynamics. Although the average length of community schooling has increased, this is not enough to guarantee the welfare of farmers because their economic institutions and bargaining position are still weak. Therefore, strategic recommendations include strengthening farmer institutions, building more solid cooperatives or farmer groups, as well as food-based social protection programs to reduce the vulnerability of the poor. In addition, farmer regeneration needs to be encouraged through training and incentives for the younger generation so that they are interested in returning to the agricultural sector.

Meanwhile, from an environmental perspective, fluctuations in rice land area and the dominance of chemical inputs indicate a threat to the sustainability of agricultural ecology. The land conversion that continues to occur has the potential to reduce food production capacity in the future. Therefore, a sustainable agricultural land protection policy is needed through the establishment of Sustainable Food Agricultural Land (LP2B), control of land transfer, and the implementation of soil and water conservation practices. The use of organic fertilizers, integrated pest control, and ecologically-based farming systems need to be expanded as alternatives to reduce dependence on chemical inputs.

Strategic recommendations to support sustainable agriculture in West Pasaman Regency can be summarized in the following table:

Table 2. Strategic Recommendations for Sustainable Food Crop Development in West Pasaman Regency

Aspects	Main Problems	Strategic Recommendations
Economics	1. Fluctuating GDP growth 2. Decreased productivity 3. - Low added value	1. Productivity increase based on environmentally friendly and climate-adaptive technologies 2. Diversification and downstream of food products 3. Strengthening the value chain and market access
Social	1. Fluctuating poor population 2. Weak farmer institutions 3. Lack of regeneration of young farmers	1. Strengthening farmer institutions (cooperatives/farmer groups) 2. Food-based social protection programs 3. Incentives and training for the younger generation to enter agriculture
Milieu	1. Fluctuations in land area due to conversion of functions 2. Excessive use of chemical inputs	1. Protection of productive agricultural land (LP2B) 2. Implementation of soil and water conservation 3. Expansion of organic/ecological farming systems 4. Integrated pest control

The condition of West Pasaman that shows a more dominant Competitive Effect is a positive indication, although this success needs to be maintained through efficiency and innovation improvement strategies, so as not to be trapped in short-term fluctuations. As explained in Table 2 above, it emphasizes that sustainable agriculture strategies cannot only

focus on economic aspects, but must also consider social and environmental dimensions. This holistic approach is in line with the views of Alshaal and El-Ramady, (2017); (Abd El-Ghani et al., 2025) affirm that agricultural sustainability is not only determined by economic aspects, but also balance with social and environmental dimensions. With a positive CE, West Pasaman has the potential to develop sustainable agriculture if the growth is directed to strengthen the welfare of farmers and maintain environmental sustainability. As explained by (Pandey & Mishra, 2024), To achieve sustainable food security for individuals, communities, and countries, it is imperative to adopt a comprehensive approach that considers important factors such as availability, accessibility, utilization, stability, resilience, and sustainability.

In addition, (Boateng et al., 2025) explain that sustainable agriculture urgently needs to involve non-governmental organizations and government agencies in the food and agriculture sectors to increase efforts aimed at reducing barriers and raising awareness of smallholders supporting their livelihoods. Not only that, according to (Hasan et al., 2025), what is considered in the aspect of sustainable agriculture is also the economic, entrepreneurial aspect, and social aspect.

CONCLUSION

This study shows that the food crop subsector in West Pasaman Regency has an important contribution to regional development, with a GDP growth of 1.67% in 2024 which is higher than that of the province. The Shift Share results confirm the existence of a local competitive advantage, although fluctuating productivity trends indicate vulnerability to climate change and technological limitations. From the social aspect, this subsector still faces challenges in the form of fluctuations in the number of poor people and weak farmer institutions, even though the quality of community education is improving. From an environmental aspect, the threat of land conversion and excessive use of chemical inputs has the potential to disrupt the sustainability of agricultural ecosystems. Overall, the sustainability of the food crop sub-sector in West Pasaman can only be achieved through a strategy that balances economic, social, and environmental aspects. This includes strengthening productivity based on environmentally friendly technology, improving farmer institutions and regenerating agricultural labor, as well as protecting productive agricultural land by implementing sustainable cultivation practices. Local governments need to strengthen land protection policies and expand access to environmentally friendly agricultural technology. Strengthening farmer institutions and regenerating the younger generation must be prioritized to ensure the sustainability of the agricultural workforce. In addition, it is necessary to integrate social programs to reduce the vulnerability of farmer households while encouraging downstream food crop products to increase added value. Further research is suggested to examine supply chains and commodity diversification as the basis for the formulation of sustainable agricultural development strategies at the local level.

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