

ENHANCING RESILIENCE OF LOCAL FOOD SECURITY AMONG MARGINAL FARMERS IN RURAL AREAS TO MEET THE AGRICULTURAL LAND CONVERSION

FORTALECIMENTO DA RESILIÊNCIA DA SEGURANÇA ALIMENTAR LOCAL ENTRE PEQUENOS AGRICULTORES EM ÁREAS RURAIS PARA ATENDER À CONVERSÃO DE TERRAS AGRÍCOLAS

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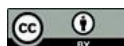
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Abstract

The complex impacts of agricultural land conversion to non-agricultural uses can cause food insecurity in homeless farmer households. The specific objectives of the study are (a) to find the reasons underlying the resilience of superior local food of homeless farmer households experiencing weakening functional benefits in rural areas prone to agricultural land conversion;

Resumo

Os impactos complexos da conversão de terras agrícolas para usos não agrícolas podem causar insegurança alimentar em famílias de agricultores sem-teto. Os objetivos específicos deste estudo são: (a) identificar as razões subjacentes à resiliência alimentar de famílias de agricultores sem-teto que enfrentam a diminuição dos benefícios funcionais em áreas



(b) to find the answer to the slow accessibility of homeless farmer households to strengthening the resilience of superior local food in rural areas prone to agricultural land conversion. The research design combines qualitative and quantitative research approaches with a more dominant qualitative approach. For the qualitative approach, a phenomenological research method with semi-grounded research is used. The subjects of the study included rural farming communities in the Gamping Sub District (Sleman Regency) and Kasihan Sub District (Bantul Regency). Data analysis techniques are the Interactive Model of Analysis and Reflexive Model. building human resources. However, food resilience is still weak in various elements of society, especially rural homeless farmer households that are vulnerable to agricultural land conversion. Food resilience is difficult to strengthen by respondent households due to empirical conditions that are directly caused by decreased income, purchasing power, employment opportunities as farm labourers, and the economic value of family members. Slow accessibility in strengthening superior local food resilience occurs in every respondent household. This slowness is evidenced by differences in empirical conditions in the elements of availability, sufficiency, security, diversity and justice in the distribution of food to family members.

Keywords: Accessibility. Empirical Conditions. Farmland Conversion. Homeless Farmers. Food Resilience.

rurais propensas à conversão de terras agrícolas; (b) encontrar soluções para a dificuldade de acesso dessas famílias a recursos alimentares locais mais robustos em áreas rurais propensas à conversão de terras agrícolas. O projeto de pesquisa combina abordagens qualitativas e quantitativas, com predominância da abordagem qualitativa. Para a abordagem qualitativa, utiliza-se o método fenomenológico com pesquisa semifundamentalizada. Os sujeitos do estudo incluem comunidades agrícolas rurais nos distritos de Gamping (Regência de Sleman) e Kasihan (Regência de Bantul). As técnicas de análise de dados utilizadas foram o Modelo Interativo de Análise e o Modelo Reflexivo. A resiliência alimentar ainda é frágil em diversos segmentos da sociedade, especialmente entre as famílias de agricultores rurais sem-teto, que são vulneráveis à conversão de terras agrícolas. A resiliência alimentar é difícil de ser fortalecida pelas famílias entrevistadas devido a condições empíricas causadas diretamente pela diminuição da renda, do poder de compra, das oportunidades de emprego como trabalhadores agrícolas e do valor econômico dos membros da família. A dificuldade de acesso ao fortalecimento de uma resiliência alimentar local superior ocorre em todas as famílias entrevistadas. Essa lentidão é evidenciada pelas diferenças nas condições empíricas nos elementos de disponibilidade, suficiência, segurança, diversidade e justiça na distribuição de alimentos aos membros da família.

Palavras-chave: Acessibilidade. Condições Empíricas. Conversão de Terras Agrícolas. Agricultores Sem-Teto. Resiliência Alimentar.

1 INTRODUCTION

Integrated agricultural development based on local and environmentally friendly resources should remain a priority sector. This is because the agricultural sector acts as a safety valve (Cavalleri, Tanwattana, and Grünbühel 2022) in providing national food security and absorbing labor across the country. Therefore, the sustainability of agricultural development in various aspects must be seriously considered. However, implementing agricultural development has faced several challenges, especially in fairly empowering farmers. The effects of the global market, commercialization, and the development of other sectors have led to a series of complex problems. The conversion

of agricultural land to non-agricultural uses has created various problems for rural farming communities (Dumasari, Dumasari, Darmawan, Wayan, Iqbal, Achmad, Dharmawan, Budi, Santosa 2020; Santosa, Muslihudin, and Adawiyah 2019; Santosa and Adawiyah 2024). According to data from the BPS of the Special Region of Yogyakarta Province (Yogyakarta 2020), there has been a significant decrease in the amount of agricultural land. This poses a risk of losing available farmland, which is difficult to prevent, potentially shifting farmers from landowners to farm laborers (5). Moreover, this shift has led to polarization, resulting in the emergence of homeless farmers. The growing number of homeless farmers faces serious issues, especially due to economic pressures during lean seasons. The fundamental impacts that arise include in the risk of food insecurity in rural households of homeless farmers who are vulnerable to agricultural land conversion (Dumasari and Santosa 2021). The threat of food insecurity, if allowed to continue, has the potential to cause a decline in the quality of human resources and competitiveness, productivity, and health (Martuti et al. 2023). This problem needs to be resolved immediately and wisely. Based on this background, an appropriate solution needs to be found. Food insecurity in rural households of homeless farmers requires strengthening the resilience of superior local food. This is what motivates the determination of the research theme which focuses on the study and discovery of the importance of conceptual participatory methods to increase the accessibility of dominant elements of superior local food resilience in rural households of homeless farmers who are vulnerable to agricultural land conversion. The chosen theme is relevant to the problems currently being faced by rural households of homeless farmers who are vulnerable to agricultural land conversion in the Sleman and Bantul Regencies of the Special Region of Yogyakarta Province. The problem of superior local food resilience of homeless farmers in rural areas prone to agricultural land conversion in this study uses an integrated approach between etic and emic. The combination of the two approaches is complemented by the use of an empirical approach that does not release the study of relevant previous concepts and theories. Thus, the formulation of participatory methods as a scientific capital provides a valuable contribution as a consideration for the preparation of brief policies for the government at the local and national levels (Yunus et al. 2020).

The urgency of this research lies in improving the quality of human resources for homeless farmers by increasing the accessibility of dominant elements of superior local

food resilience in rural areas prone to agricultural land conversion. The novel value of this research lies in the output of the results in the form of scientific capital of participatory methods as an alternative strategic solution. Previous research on the existence of homeless farmer households is still limited to studies of economic, social, and cultural problems (Santosa et al. 2020); (Zhang and Xu 2016); (Ofuoku and Ekorhi-Robinson 2018); (Dumasari, Santosa 2021); (Heger 2020); (Badaruddin et al. 2018); (Kaminer 2020); (Abeler et al. 2021); (Wijers 2019); (Sabin et al. 2022); (Imam and Dumasari 2018); (Santosa 2016);(Wiwiek R. Adawiyah 2021). The problem of food insecurity faced by this community has not touched on fundamental solutions to be able to solve the problem. The state-of-the-art research lies in the scientific capital findings of participatory methods that are constructed empirically and conceptually to build food resilience based on local resources. Thus, landless farmer households have a sense of belonging to the participatory methods developed.

2 MATERIAL AND METHOD

The research location was determined by purposive sampling. The research subjects included rural farming communities in Gamping District, Sleman Regency and Kasihan District, Bantul Regency. Both research locations are in the Special Region of Yogyakarta Province. The reason for determining the location was that the two districts in question are rural areas in the Special Region of Yogyakarta Province with the highest conversion of agricultural land. Therefore, the formulation and objectives of the research are relevant to the problems in the selected research locations. The research design combines qualitative and quantitative research approaches with a more dominant qualitative approach. For the qualitative approach, a phenomenological research method with semi-grounded research is used. The research subjects included rural farming communities in Gamping Sub District, Sleman Regency, and Kasihan Sub District, Bantul Regency. The four research locations are located in the Special Region of Yogyakarta Province. The informant data source was determined by purposive sampling. The data analysis technique is the Interactive Model of Analysis and the Reflection Model. Mandatory output in the form of using embedded case study method is utilized to answer the problem formulation. The approach used is a combination of qualitative and quantitative with qualitative dominant (Creswell, 1994). The determination of the

location is based on the areas with the first and second-highest land conversion in the Special Region of Yogyakarta Province. Determination of data sources using purposive sampling techniques. Other primary data sources are key respondents consisting of community leaders, village officials, and those residing in the two predetermined villages. Key informants were selected using the rolling snowball technique. The number of respondents and key informants in this study was not strictly limited as in statistical rules in probability sampling, because what was sought was emphasized on meeting the needs, completeness, and depth of the data. Data can be divided into two types. The first is primary data. The Second is secondary data. The research subjects include all villagers in Gamping District (two villages taken) and villagers in Kasihan District (two villages taken) in Bantul Regency, both in the Special Region of Yogyakarta Province/ The informant determination technique is carried out using purposive sampling techniques. Several criteria are used to select informants: (1) entering the agricultural land conversion area, (2) being active as farmers, (3) being farmers affected by land conversion, and (4) being willing to be interviewed. Other primary data sources are respondents who are determined by simple random sampling. Key informants are determined using purposive techniques. These two data sources are used as a means to check and recheck data. The data processing techniques used in both the first and second stages are carried out, namely through the entry, editing, data display, data reduction, analysis interpretation, and conclusions. The data obtained as a whole, both qualitatively and quantitatively, are analyzed to complement each other. All collected data were analyzed using interactive analysis techniques (Miles and Huberman, 1991), reflection tests, and simple statistics (percentage values, tabulation, mean values , and frequency distribution).

3 RESULTS AND DISCUSSION

Initially, the concept of resilience came from the discipline of ecology to describe the social impact of climate change Caroline (Wenger, 2017; Kinseng, 2019), but in its development it was interpreted as the capacity of a system to overcome problems, both from within and from outside. In reality, resilience refers to individuals, organizations, and other social entities. This is explained by Keck and Saldoporak (2013) and (Adger, 2000). The author views that this concept of resilience can also be associated with the resilience of superior local food in defending itself from various pressures. Empirical facts

regarding food resilience developed by all respondents in this study have various forms. The various forms of resilience experienced a weakening of functional benefits. The root of the problem behind the weakening of functional benefits in the resilience of superior local food turned out to be due to the root of the problem originating from the issue of agricultural land conversion. So far, the conversion of agricultural land that has taken place at the research location has had a significant impact on the weakening of the functional benefits of food resilience in each respondent household. The conversion of agricultural land to non-agricultural land is indeed top-down or comes from national, regional, or local program instructions. Meanwhile, other conversion events are due to the willingness of respondents who are willing to sell their agricultural land to be used for development outside of agriculture, especially for culinary locations, settlements, shops, industrial locations, regional tourism, and others. It is rare to find a conversion of land from agriculture to agricultural interests, for example, repairing rice field embankments and making water channels, water reservoirs, and drying areas for harvested crops.

Various forms of food resilience that experience a weakening of functional benefits are experienced by all respondents except for the form of food resilience in the form of purchasing various types of superior local food in cash and a system of exchanging superior local food ingredients by barter. Both forms of resilience are alternatives for respondent households to solve the problem of food insecurity experienced, especially during the lean season. Not all respondents can buy food in cash. The tendency is that food purchases are made using loans. The barter system is also carried out on a limited basis by residents who still have ties of neighborliness and kinship and live in the same village. Information on the various forms of local superior food resilience that are weakening and their relationship to the conversion of farmers' land to superior non-agricultural land can be seen in Table 1.

Table 1

Various forms of food resilience with weakened functional benefits and the percentages of respondents

No	Form of Superior Local Food Resilience	Root Cause (Reason)	Functional Benefits	Percentages of Respondents (%)
1	Collecting various types of superior local food from the farming efforts of neighbors and relatives in the village	Land conversion reduces harvest area, leading to reduced availability of superior local food types	Weakened	Majority (100%)
2	Storage of superior local food ingredients, distribution of harvest results	Storage of superior local food ingredients, distribution of harvest results	Weakened	Majority (100%)
3	Utilization of superior local food aid from the services of porters and harvest workers	Land conversion limits harvest area, reducing job opportunities for porters and harvest workers	Weakened	Majority (100)
4	Purchasing various types of superior local food ingredients in cash	Land conversion decreases the cultivation area, limiting availability of local food ingredients in village markets, affecting cash purchases	Weakened	Minority (45)
5	Purchasing various types of superior local food ingredients on credit	Land conversion reduces the availability of superior local food ingredients in village markets, leading to limited purchases on credit	Weakened	Majority (100)
6	Barter of superior local food ingredients	Reduced farming area due to land conversion limits the barter exchange of local food ingredients	Weakened.	Majority (75)
7	Utilization of food aid from the village government	Reduced cultivation increases the number of aid recipients, making distribution more competitive	Weakened	Majority (100)
8	Family rule for conserving superior local food	Land conversion delays	Weakened	Majority (100)

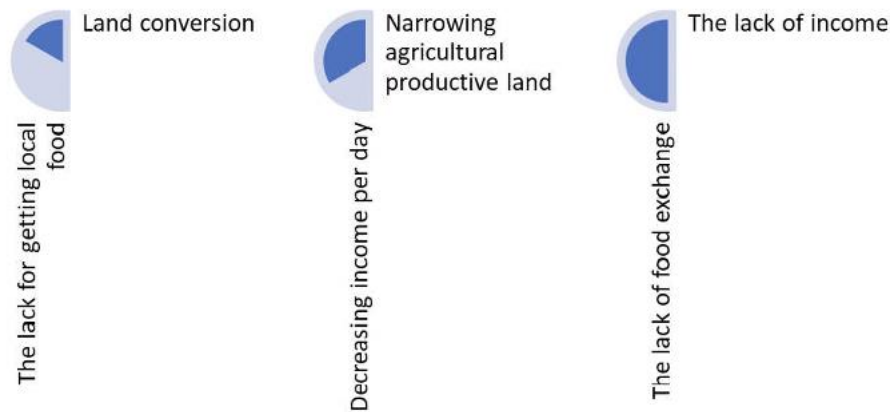
Sources: Primary Data 2024 (processed)

The process of weakening the functional benefits of superior local food resilience experienced by all respondent households is a cause-and-effect event. There is a causal relationship that is related between one event and the next. Empirical conditions show that the conversion of agricultural land to non-agricultural land has directly caused a reduction in the area of cultivated land for farming. Before the conversion, respondents

found it easier to get work opportunities as farm laborers on the land cultivated by farmer-owners who had been their regular customers. However, after the conversion, the problem of narrowing the cultivated land area for farming eventually gave rise. The available job opportunities are increasingly limited. Work as farm laborers becomes selective and those who are called to work tend to be limited to groups of residents who already have social closeness with the owners and tenants of agricultural land. Respondents who have less social close are rarely called to work. Except to replace farm laborers who are indeed unable to. The subsequent conversion processes resulted in a significant decrease in income for respondent households. Before the conversion, income from farm labor services was obtained on average IDR75,000 - IDR100,000 per day routinely. Meanwhile, after the conversion, the income is no longer routinely received by the respondents, thus reducing household income. Of course, this problem has an impact on the economic capacity to meet the costs of the superior local food consumed every day. The inevitable consequence is that food purchasing power is reduced. The readiness of food provision that was originally obtained through the distribution of harvest results for the family's superior local food reserves is also decreasing. Respondent households are increasingly losing the opportunity to store food reserves that will be consumed, especially during times of famine. Such empirical conditions are complex and intertwined. The next problem borne by respondent households is that social relations in the form of food exchange between neighbors or relatives who live close by are increasingly rare. This is because the harvest of various types of superior local food is no longer available. Therefore, the opportunity to share food by bartering is scarce. The series of empirical conditions that underlie the weakening of the functional benefits of superior local food resilience in respondent households can be observed in more detail in Figure 1.

Figure 1

Various causes of functional benefits of local food resilience superior weakening in rural areas prone to agricultural land conversion



The weakening of the functional benefits of superior local food resilience experienced by all respondents shows the difference in empirical conditions that occurred before and after the conversion. The results of the analysis prove that there are several elements found in empirical conditions. The variety of these elements functions as a characteristic that colors the ability of respondent households in several interests of superior local food resilience. Several elements of empirical conditions show in real terms the functional benefits of food resilience regarding the availability, sufficiency, security, assurance, diversity, and justice of food. These six elements are determining indicators for the achievement of food security and sovereignty at the household level.

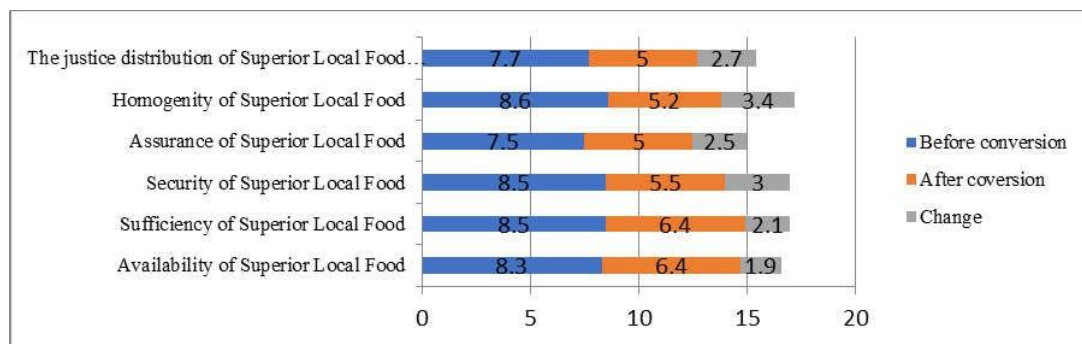
The element that experienced the most severe change between before and after the conversion was the diversity of superior local food ingredients. Respondent households reduced the diversity of food consumed. This empirical condition became a problem in meeting nutritional needs. The food menu was reduced from four types to 3 types. The menu before the conversion was rice, vegetables, eggs tofu, and tempeh. The diversity of the menu after the conversion became rice, vegetables tofu, and tempeh side dishes.

Dominant changes also occurred in the elements of security, and justice in the distribution and assurance of various types of superior local food. All respondent households realized and acknowledged that food security had decreased because, since the conversion, the ability to maintain food security that varied was disrupted due to declining purchasing power. The sense of security in the ability to meet food needs was

replaced by a sense of worry about the difficulty of meeting food needs for consumption by family members. The element of justice in the distribution of superior local food was also dominantly changed. All respondent households explained that there was a sense of injustice when distributing food to all family members. The portions and menus for adult family members were often reduced to meet the consumption needs of children, pregnant and breastfeeding women, sick family members, and the elderly. A clearer description of the empirical conditions of the five elements can be seen in Fig2.

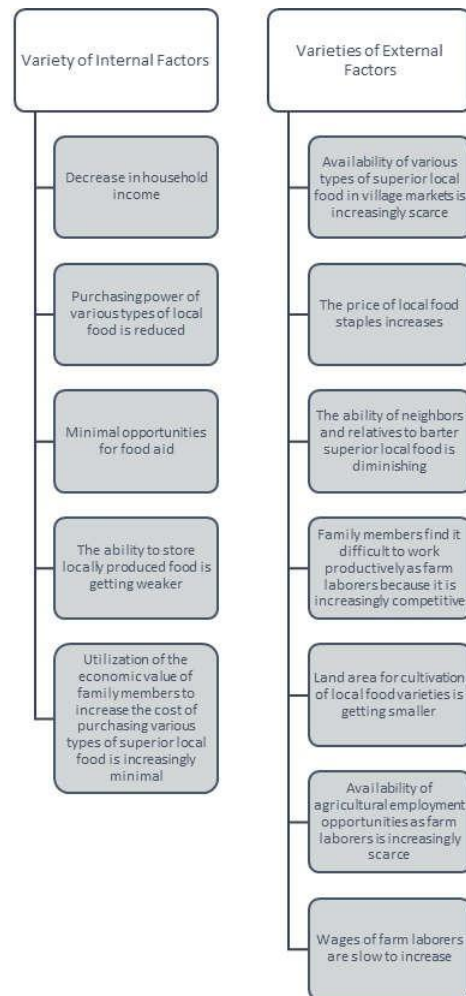
Figure 2

Differences in Empirical Conditions of Weakened Functional Benefits in Superior Local Food Resilience



The functional benefits of superior local food resilience that have become weak have indeed become a serious problem for respondent households. The decrease in the intensity of the function of various elements of food security also proves the risk of food insecurity that always threatens the fulfillment of food and nutritional consumption needs. The consequences of conversion have a significant impact on slow accessibility in strengthening superior local food resilience. Based on the results of data analysis, it is proven that there are several factors causing the problem. The series of causal factors in question are distinguished according to their sources. Some causal factors are included in the internal category. While others are included in the external category. However, both categories of causal factors have a relatively strong causal relationship. Internal causal factors include decreased income, reduced purchasing power, minimal opportunities to obtain food assistance, the ability to store scarce food, and the utilization of the economic value of family members is limited. All internal causal factors are centered on the respondent household, which has difficulty working productively as a farm laborer. Then the problem becomes more serious when the opportunity to obtain various types of

superior local food that was previously easy becomes difficult due to the narrowing of land area for cultivating various types of food. Meanwhile, external causal factors are centered on the environment outside the respondent's household. The influence of external causes is more difficult to control because there is pressure from various parties. The scope of external causal factors is the availability of a variety of scarce food ingredients in the local market. This problem arises due to the increasingly narrow area of superior local food harvest land. The needs of villagers for food are partly met by the production from nearby villages or from other regional markets. Another external causal factor is the price of local food which continues to increase. This problem is also difficult to overcome because its availability depends on the production results from farming businesses outside the village. Several other external causal factors are related to the increasingly rare way of bartering food between neighbors or relatives. The availability of superior local food is rarely available so bartering is not possible. The limitations of productive work available to villagers are limited, especially to farming activities. This is also included as an external causal factor that results in slow accessibility to strengthen food resilience. Clearer information about the results of various internal and external causal factors that cause slow accessibility of respondent households to strengthen food resilience is contained in Figure 3.

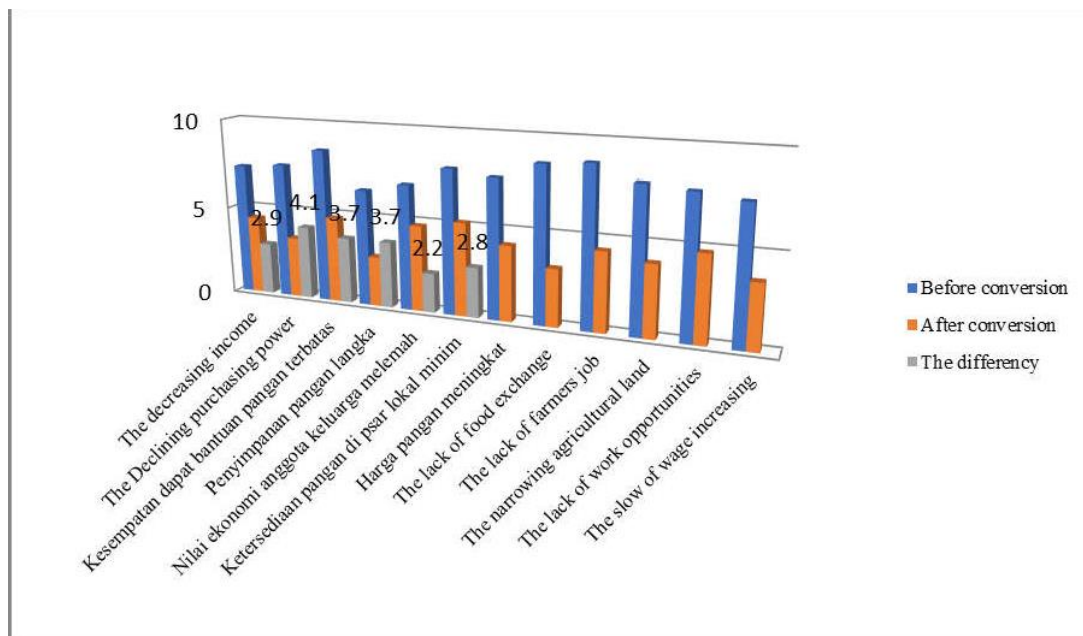
Figure 3*Slow respondent household accessibility to strengthening superior local food resilience*

Various internal and external factors influence food resilience both before and after conversion, and these factors vary in intensity. One of the most significant changes observed is the scarcity of food barter. The exchange of superior local food items has declined, as the types and volumes of materials available for exchange have diminished or become unavailable. Initially, households used bartering to increase the diversity of food consumed. However, the scarcity of food barter has ultimately hindered accessibility, weakening food resilience. Another important factor showing a notable difference before and after conversion is the limited ability to find productive work as farm laborers. The criteria for becoming a farm laborer have become stricter, with only a select few trusted individuals working regularly.

Additionally, the decline in purchasing power for food is a significant factor that hampers accessibility for households aiming to enhance food resilience. The reduction of agricultural land designated for various food types also contributes to this issue, directly decreasing the production of superior local food ingredients. Overall, the differences in intensity across all internal and external factors affecting the slow accessibility in strengthening food resilience are illustrated in Figure 5. Another causal factor with a high difference in intensity is the decreasing purchasing power of food. This cause makes accessibility slow when respondent households will strengthen food resilience. It can observe in Fig 5. The narrowing of agricultural land for various types of food is a causal factor that has a high difference in intensity. This directly reduces the production of various types of superior local food ingredients. The difference in intensity of all internal and external causal factors for the slowness of accessibility in strengthening food resilience can be observed in Figure 4.

Figure 4

Differences in intensity of factors causing slow accessibility to strengthening food resilience



The narrowing of agricultural land for various types of food is a causal factor that has a high difference in intensity. This directly reduces the production of various types of superior local food ingredients. The difference in intensity of all internal and external causal factors for the slowness of accessibility in strengthening food resilience. The study discusses how a participatory approach, involving active engagement from farmers in production, consumption, and distribution, could significantly enhance local food resilience. Key strategies include promoting collective actions and identifying local figures (from government or community leaders) who can guide and reinforce social resilience. The findings emphasize the need for collective efforts and sustainable methods, with suggestions for policymakers to facilitate access to dominant resources for food resilience. This participatory approach can serve as a scientific model for building sustainable food systems based on local resources.

4 CONCLUSION AND SUGGESTIONS

Empirical conditions show that several forms of superior local food resilience are experiencing a weakening of functional benefits in all respondent households. The root cause of this weakening benefit problem stems from the conversion of agricultural land to non- agricultural land. The process of weakening functional benefits takes place gradually, resulting in a decrease in income and purchasing power of farm laborer respondents for food for family consumption needs. Food exchange by barter is increasingly rare even though this method is the easiest for respondent households to obtain superior local food. Land conversion also has an impact on the decline in the types and volume of food ingredients in the local market. Economic limitations make it difficult for respondent households to meet food needs. Slow accessibility to the strength of food resilience is due to various internal and external causal factors. Strengthening the resilience of superior local food is indeed not carried out by farmer households. Efforts to develop capabilities in suppressing the influence of internal and external causes need to be carried out intensively. Increasing the readiness of human resources for farm laborers in productive and creative behavior in diversifying livelihood patterns is one solution to strengthening the diversification of local food patterns. Expand on the findings to suggest targeted policies that local governments could implement. Policies based social

capitals aimed at promoting awareness of local food benefits, enhancing communication networks, and protecting agricultural land against conversion.

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Authors' Contribution

Both authors contributed equally to the development of this article.

Data availability

All datasets relevant to this study's findings are fully available within the article.

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