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VARIATIONS IN EMPIRICAL CONDITIONS OF FOOD RESILIENCE TECHNIQUES TO ADDRESS FOOD CRISES IN LANDLESS FARMER HOUSEHOLDS IN RURAL AREAS PRONE TO AGRICULTURAL LAND CONVERSION

VARIAÇÕES NAS CONDIÇÕES EMPÍRICAS DAS TÉCNICAS DE RESILIÊNCIA ALIMENTAR PARA ENFRENTAR CRISES ALIMENTARES EM FAMÍLIAS DE AGRICULTORES SEM-TERRA EM ÁREAS RURAIS PROPENSAS À CONVERSÃO DE TERRAS PARA USO AGRÍCOLA

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Abstract
The independent food resilience of landless farmer households needs to be seriously strengthened in rural areas prone to agricultural land conversion. This effort is both potential and strategic for supporting the improvement of human resource quality in agriculture. However, economic pressure and the scarcity of productive job opportunities weaken independent food resilience. One primary cause is the ongoing conversion of agricultural land. This issue requires a wise and precise solution. The specific objective of this study is to examine the empirical conditions and techniques of food resilience in landless farmer households in rural areas vulnerable to agricultural land conversion. The study was intentionally conducted in rural areas of Kembaran Sub-district, Banyumas Regency, and Kutasari Sub-district, Purbalingga Regency, Central Java Province. The research design integrates mixed methods, field studies using intrinsic case study methods with qualitative and quantitative approaches. Scientific method assembly with participatory methods was achieved through Narrative Synthesis. Collaborative Study Methods (JISAM) were utilized for a consortium-based collaborative

Resumo
A resiliência alimentar independente de famílias de agricultores sem terra precisa ser seriamente fortalecida em áreas rurais propensas à conversão de terras agrícolas. Esse esforço é tanto potencial quanto estratégico para apoiar a melhoria da qualidade dos recursos humanos na agricultura. No entanto, a pressão econômica e a escassez de oportunidades de trabalho produtivo enfraquecem a resiliência alimentar independente. Uma das principais causas é a conversão contínua de terras agrícolas. Essa questão requer uma solução sábia e precisa. O objetivo específico deste estudo é examinar as condições empíricas e as técnicas de resiliência alimentar em famílias de agricultores sem terra em áreas rurais vulneráveis à conversão de terras agrícolas. O estudo foi conduzido intencionalmente em áreas rurais do distrito de Kembaran, município de Banyumas, e do distrito de Kutasari, município de Purbalingga, província de Java Central. O projeto de pesquisa integra métodos mistos, estudos de campo utilizando métodos de estudo de caso intrínseco com abordagens qualitativas e quantitativas. A combinação do método científico com métodos participativos foi

examination of research problems. Research findings reveal three food resilience techniques among respondent households: emergency, permanent, and integrated food resilience. Each technique shows varying empirical conditions influenced by determining factors. The most dominant factors are food accessibility, food availability, income, food storage, and food processing technological proficiency. Enhancing the functionality of these five determinants significantly strengthens the three food resilience techniques toward independence.

Keywords: Food Security. Empirical Conditions. Agricultural Land Conversion. Landless Farmers. Food Resilience.

alcançada por meio da Síntese Narrativa. Os Métodos de Estudo Colaborativo (JISAM) foram utilizados para um exame colaborativo baseado em consórcio dos problemas de pesquisa. Os resultados da pesquisa revelam três técnicas de resiliência alimentar entre as famílias entrevistadas: resiliência alimentar emergencial, permanente e integrada. Cada técnica apresenta condições empíricas variáveis, influenciadas por fatores determinantes. Os fatores mais dominantes são a acessibilidade aos alimentos, a disponibilidade de alimentos, a renda, o armazenamento de alimentos e a proficiência tecnológica no processamento de alimentos. O aprimoramento da funcionalidade desses cinco determinantes fortalece significativamente as três técnicas de resiliência alimentar, promovendo a independência.

Palavras-chave: *Segurança Alimentar. Condições Empíricas. Conversão de Terras Agrícolas. Agricultores sem Terra. Resiliência Alimentar.*

1 INTRODUCTION

Food security is a fundamental aspect of sustainable development, particularly in the agricultural sector, which serves as a livelihood foundation for the majority of rural communities (Estrada-Carmona *et al*., 2020; Kurnaedi *et al*., 2021). Empowering farmers in this context plays a critical role, not only in improving the quality of human resources but also in strengthening household-level food independence (Mwololoa *et al*., 2022; Mudzielwana *et al*., 2022). Farmers with high resilience are expected to adapt and endure crises resulting from social, economic, or environmental pressures (Josefsson *et al*., 2017; Sabin *et al*., 2020). This condition is particularly vulnerable for landless farmers who rely solely on wage labor (Dumasari *et al*., 2020; Ofuoku & Ekorhi-Robinson, 2018; Memon *et al*., 2019). For these households, food resilience becomes a cornerstone of economic stability and life sustainability.

Complex challenges often hinder efforts to achieve resilience (Fontainha & Lazzaro, 2019; Izzah & Jazilah, 2022). This issue is especially prevalent in rural areas experiencing agricultural land conversion for non-agricultural purposes, such as those in Kembaran and Sumbang Sub-districts, Banyumas Regency, as well as Kutasari and Bojongsari Sub-districts, Purbalingga Regency (Dumasari, *et al*., 2021). The conversion

of farmland for tourism, housing, roads, industry, parking areas, culinary zones, and local markets not only reduces arable land but also limits job opportunities in the agricultural sector. This shift directly impacts the income and purchasing power of landless farming households.

As their income declines due to limited labor opportunities, these households face recurrent threats of food crises throughout the year (Sinha, 2021). The reduction in food security not only affects individuals and families but also poses a long-term risk to national food security (Elsahoryi *et al*., 2020; Alpízar *et al*., 2020). When rural landless farming households are unable to secure sufficient food access, the risks of malnutrition and declining human capital quality escalate (Knorr & Khoo, 2020; Chen *et al*., 2018). Furthermore, the weakening of food resilience among these households obstructs government efforts to achieve sustainable agricultural development that holistically supports food security.

This study highlights various food resilience techniques adopted by landless farming households to address economic and environmental pressures amidst the threats of land conversion. Emergency, permanent, and integrated food resilience techniques have been identified as adaptive responses employed by farmers in the study areas. Emergency food resilience is used to address sudden crises, such as abrupt food shortages caused by price hikes or temporary job losses. Permanent food resilience manages seasonal risks, such as income reductions during certain periods, while integrated resilience combines both techniques to handle more complex crises.

By understanding the empirical conditions and functional benefits of each resilience technique, this study aims to provide alternative, effective solutions for landless farming households facing food crises. Additionally, the findings are expected to offer conceptual and theoretical foundations for government policies that support landless farmers in areas prone to land conversion. This approach is critical to ensuring that agricultural development as a basis for food security not only focuses on food provision but also considers equity and welfare for vulnerable farming communities.

2 MATERIAL AND METHODS

This study was conducted in two sub-districts in Central Java Province, namely Kembaran Sub-district in Banyumas Regency and Kutasari Sub-district in Purbalingga

Regency. These locations were strategically chosen as they are rural areas vulnerable to the conversion of agricultural land to non-agricultural purposes, which directly impacts landless farmer households. This process of land conversion reduces the available farmland for landless farmers and limits job opportunities as farm laborers, thereby hindering efforts to build strong food resilience. This condition also affects the weakening of social cohesion, which previously served as a binding force in collective work within the agricultural sector.

The research approach used was a mixed-methods method that combines qualitative and quantitative approaches, allowing for an in-depth exploration of the food resilience strategies implemented by landless farmers. This method employed an intrinsic case study design, which helped the researchers understand the variations in experiences and unique patterns of farmer households in dealing with food crises. The combination of qualitative and quantitative approaches allowed this research to touch on personal and social aspects while obtaining numerical data to strengthen the analysis.

2.1 Respondent selection

The respondents of this study were purposively selected based on specific criteria, namely households residing in the study area, working as landless farm laborers, and having a low income, which is less than IDR 800,000 per month. The number of respondents was not determined by specific statistical rules but rather based on the depth of data required to gain a comprehensive understanding. Furthermore, the researchers involved key informants, such as community leaders and village officials, who played an important role in providing contextual and in-depth information about the condition of landless farmers. The selection of key informants was carried out using the snowball sampling technique, where initial informants directed the researchers to other relevant individuals.

2.2 Data collection techniques

The techniques for data collection in this study included in-depth interviews, participatory observation, focus group discussions (FGD), and literature review. In-depth interviews were conducted with the heads of landless farmer households and family

members involved in decision-making related to food resilience. Through these interviews, the researchers were able to explore the perceptions, experiences, and strategies used by households to overcome food security challenges. Participatory observation was carried out to understand the daily life patterns and how food resilience was applied in their routine activities. Focus group discussions provided additional insights into collective experiences, social cohesion, and solidarity among landless farmers in facing economic and food-related challenges. The literature review complemented the primary data with conceptual information from relevant academic sources.

2.3 Data analysis

The data analysis was carried out using a complementary approach between qualitative and quantitative techniques. Qualitative data were analyzed using **6ontente analysis** to identify the main themes that emerged from interviews and observations, while na interaction analysis model was used to examine the interrelation between factors influencing food resilience. To improve data validity, the researchers conducted triangulation, comparing results from various data sources such as interviews, observations, and FGD, to ensure consistency of the information obtained. Quantitative data were analyzed using non-parametric statistics, such as calculating percentages, frequency distributions, and averages, to provide a general overview of the implementation of food resilience strategies and the functional benefits perceived by landless farmer households.

4 RESULT AND DISCUSSION

4.1 Food resilience as a key to address food crisis

Food resilience serves as a key to resolving crises and vulnerabilities in fulfilling food and nutritional needs. The essential function of food resilience cannot be overlooked in efforts to enhance human resource quality (Dassir *et al*., 2021; Hu & Jiayun, 2023; Sekabira *et al*., 2023). This conceptual statement is also evident in the households of the study respondents. Food resilience has been implemented and developed to ensure that

fulfilling food and nutritional needs does not pose risks to physical and non-physical health. The orientation of food resilience inherently possesses a complex and broad dimension (Fontainha & Lazzaro, 2019; Sabin *et al*., 2020).

Food resilience acts as a safety valve for all respondent households. The research findings reveal three food resilience techniques applied by respondents in the study locations. These three techniques are utilized by respondent households to address various types of food crises with varying degrees of severity. The first technique is emergency food resilience, the second is permanent food resilience, and the third is integrated food resilience, which combines emergency and permanent resilience. All respondent households have applied these three techniques, although some have been further developed and modified to provide more optimal benefits. The development and modification of these techniques were carried out according to the households' experiences, economic capabilities, and empirical conditions of the food crisis. The ability to modify each food resilience technique is only found in respondent households with sufficient experience, accessibility, and sensitivity to various forms of food crisis threats. However, the proportion of households capable of such modifications is relatively low (30 percent).

4.2 Emergency food resilience

Emergency food resilience is applied spontaneously to immediately address food shortages due to economic pressures, such as when employment as a farm laborer is lost. This situation often occurs when respondent households do not receive calls for work in the agricultural sector. When food prices rise, panic often sets in, forcing respondent households to face the threat of a food crisis through emergency food resilience. The characteristics of emergency resilience include being implemented suddenly, without planning, with uncertain symptoms, accompanied by panic, and resulting in impacts that are difficult to control. Additionally, emergency resilience is incidental in nature. All respondent households have implemented emergency food resilience techniques. However, the success rate in resolving food crises through emergency resilience is relatively low, as it remains below 50 percent.

4.3 Permanent food resilience

Permanent food resilience has become a routine for all respondent households. This resilience technique is used to address lean seasons or periods preceding harvest time. Furthermore, permanent food resilience is applied during economic pressures resulting from income reductions and limited opportunities for farm labor work. The limited availability of farm labor work makes it increasingly challenging to access economic resources. Often, respondent households earn no income for several days or even experience complete income loss. Respondent households are already trained in addressing seasonal food crises. Fulfilling food needs is often done by borrowing cash to purchase food from landowners or potential creditors. Another method used is buying food on credit. Permanent food resilience is characterized by seasonal occurrences, with definite and clear symptoms because it occurs routinely, involves planning based on experience, is easier to manage, and induces relatively low panic.

4.4 Integrated food resilience

Integrated food resilience is applied when simultaneous food crises arise, combining emergency and permanent crises. This resilience technique is rarely employed because food vulnerability situations caused by price increases and income reductions only occur at specific times. Integrated food resilience becomes a choice to address complex food crisis problems. The impacts of such crises tend to be more severe for respondent households. Adjustments to eating patterns, frequency, and types of food consumed are part of the integrated resilience strategy. Additionally, food assistance from the government and village residents is utilized. The ability of respondent households to apply these three food resilience techniques is shown in Tab. 1.

Table 1

Household Respondents' Capability in Applying Three Food Resilience Techniques

No.	Food Resilience Technique	Respondent Adoption (%)	Capability in Implementation	Realization (%)	Functional Benefits
1	Emergency	100	Developed	100	Minimal
2	Permanent	100	Modified	30	Maximal
			Developed	100	Minimal
			Modified	50	Maximal

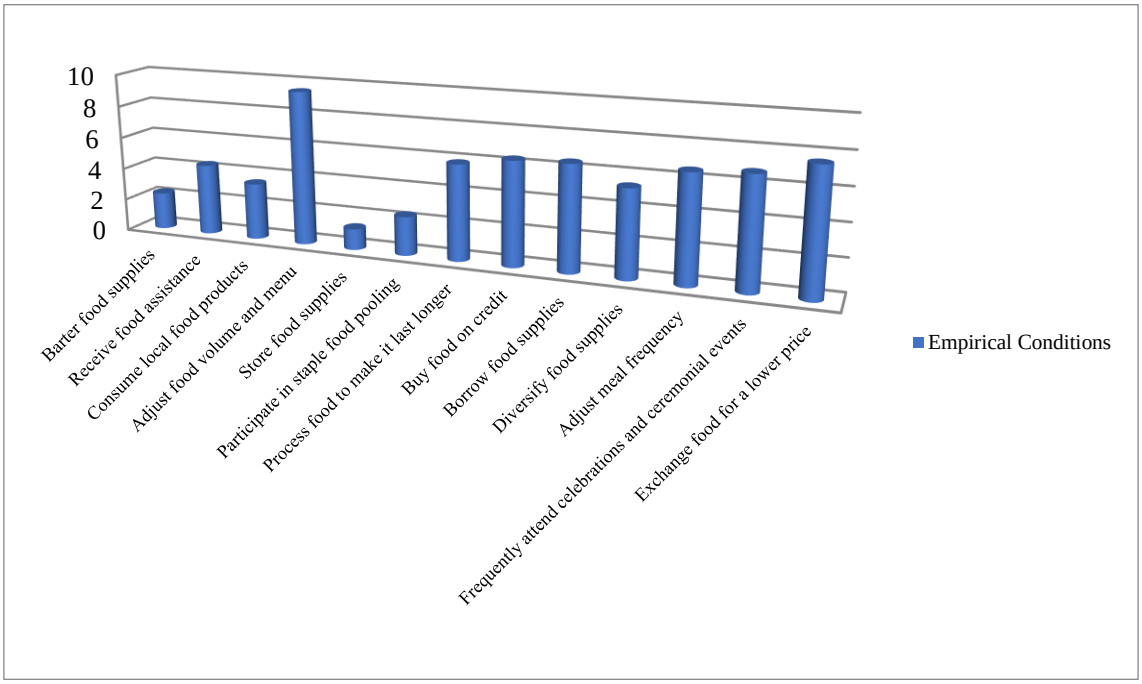
3	Integrated	30	Developed	100	Minimal
			Modified	10	Maximal

The three food resilience techniques implemented by all respondent households exhibit different empirical conditions. Respondent households experience varying empirical conditions in applying food resilience. These variations are determined by several factors, such as income, food prices, employment status, diversification of livelihoods, productive behavior, availability of local food supplies, food accessibility, food storage, food processing, social relationships, and participation in food assistance programs. Each determinant factor has a different level of influence on each respondent household, although there are close interconnections between one factor and another.

The analysis results indicate that the strongest determining factors are food accessibility, availability of food supplies, income, storage capability, and proficiency in food processing technology. These five factors have dominant strength in determining the implementation, development, and modification of food resilience, compared to other factors such as food prices, employment status, livelihood diversification, productive behavior, social relationships, participation, and the diversification of nutritious food supplies. The existence of these various determinant factors of empirical conditions can be seen in Fig. 1.

Figure 1

The Existence of Empirical Conditions of Various Determinant Factors of Food Resilience



Based on the differences in empirical conditions from various determining factors, it is evident that all respondent households are aware of food resilience techniques, with some techniques considered the most dominant in providing functional benefits for food resilience capability. This assessment is based on the effectiveness of these techniques in optimizing food resilience. The most dominant food resilience technique is strengthening food accessibility, either through the household's ability to independently provide food supplies or through assistance from government programs and self-managed initiatives by village residents. All respondent households acknowledged that strengthening accessibility significantly benefits them in facing various food crisis threats.

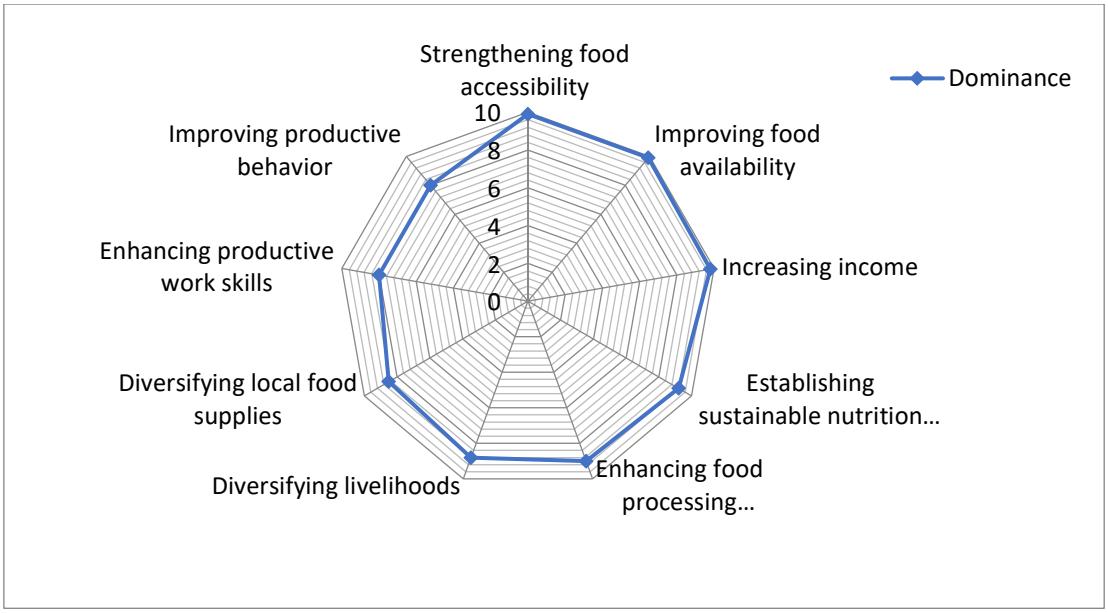
Another dominant food resilience technique is improving the availability of food supplies that are easily accessible to village residents, including the respondents. This availability is supported through collaboration among stakeholders in procuring nutritious food supplies. Social cohesion and collective action within the village community are utilized to foster care and community sentiment toward fulfilling food needs together, such as through the traditions of "*jimpitan*" and "*arisan*." *Jimpitan* is the tradition of

collecting food supplies in certain quantities, either voluntarily or mandatorily, for shared benefits.

An alternative approach to enhancing food resilience lies in boosting household income. When income is stable and reliable, households are better positioned to secure and sustain their access to nutritious food, ensuring their dietary needs are consistently met. However, since land conversion began, increasing income has become challenging due to limited productive job opportunities as tenant farmers and agricultural laborers. Additionally, the ability to store food supplies and proficiency in food processing technology are also resilience techniques that offer the highest functional benefits. Some other resilience techniques vary in their dominant values. The varying strengths of these food resilience techniques are illustrated in Fig. 2.

Figure 2

Empirical Conditions of Food Resilience



The emergency, permanent, and integrated food resilience techniques have provided functional benefits in the moderate category, with effectiveness exceeding 50 percent in helping respondent households address food crisis issues. Based on Figure 3, the integrated food resilience technique demonstrates the highest functional benefit in the moderate category, with a value of 60, followed by permanent resilience at 52, and emergency resilience at 50. This indicates that integrated resilience is a more effective

choice for addressing complex food crises, as it combines both emergency and permanent approaches.

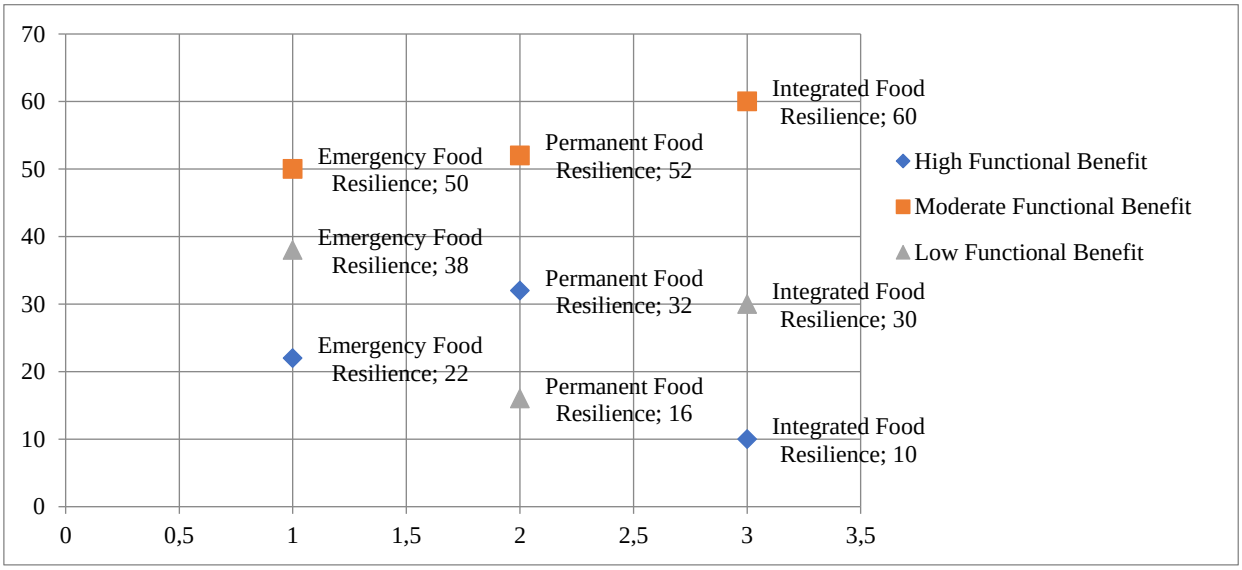
Nevertheless, there are still households that only experience functional benefits in the low category. Fig. 3 shows that permanent food resilience has a low functional benefit value of 16, while integrated resilience in the low category has a value of 30, and emergency resilience has a value of 38. This indicates that the effectiveness of permanent resilience in the low category is relatively more limited compared to other techniques, highlighting its constraints in certain situations.

The number of households experiencing difficulties in applying all three food resilience techniques is relatively small, but the existence of low-benefit categories indicates that there are still households struggling to optimize these techniques. Differences in the levels of functional benefits cause the majority of respondent households to continue facing challenges in overcoming food crises. These challenges are spread across all three resilience techniques, showing that not all households are able to implement food resilience optimally. For example, although integrated resilience demonstrates the highest benefit in the moderate category, in the low category, permanent resilience is the most frequently constrained by its effectiveness.

More detailed information about the variations in effectiveness is illustrated in Figure 3, which highlights that the high functional benefit category for all three resilience techniques remains quite limited, with permanent and emergency resilience showing the highest values in the low category (32 for permanent and 22 for emergency). Overall, the chart illustrates that the effectiveness of each food resilience technique is uneven across households, indicating a need to improve the ability of households to utilize these techniques more effectively, particularly in the context of permanent resilience, which shows the greatest challenges in the low category.

Figure 3

Distribution of Functional Benefits of Emergency, Permanent, and Integrated Food Resilience Techniques



5 CONCLUSION AND SUGGESTION

This study demonstrates that landless farmer households in rural areas prone to land conversion employ three food resilience techniques to address food crises: emergency, permanent, and integrated resilience. Each technique exhibits varying levels of effectiveness. Integrated food resilience—which combines emergency and permanent approaches—has proven to be the most effective at a moderate level, while permanent resilience tends to face limitations, particularly in the low-effectiveness category. Factors such as food accessibility and availability, income, and food processing technology play crucial roles in determining the success of these resilience strategies. Although community initiatives like food pooling ("*arisan pangan*") and "*jimpitan*" have contributed to food security, many households still face challenges, especially during crises when income sources are disrupted.

This indicates that more in-depth and focused efforts are needed to strengthen household food resilience in these regions. It is essential for local governments to expand food assistance programs, particularly during critical periods such as lean seasons or when food prices rise sharply. Assistance or price subsidies for staple foods can alleviate the

burden on landless farmer households and reduce their reliance on emergency strategies, which are less stable in the long term.

Additionally, strengthening social cohesion at the community level can be key to enhancing food security. Village governments and community leaders should encourage collective initiatives such as "jimpitan" and food pooling ("arisan pangan"), which can serve as communal food reserves. With support from village governments, these food pooling groups can become accessible to all households, creating a stronger social support system to combat food crises. Moreover, training in food processing technology should be provided to landless farmer households. This training could include effective food storage techniques and processing methods to extend the shelf life of food supplies. Such skills would enable households to maximize available resources, especially during crises, thereby reducing reliance on external assistance.

Livelihood diversification is also critical in improving the economic resilience of farmer households. Given that job opportunities in the agricultural sector are increasingly limited due to land conversion, local governments or private institutions should facilitate skills training in non-agricultural sectors such as crafts, small businesses, or creative industries. Additional income from non-agricultural activities will enhance households' purchasing power, enabling them to more consistently meet their food needs.

Finally, it is vital for local governments to formulate food security policies based on local data and tailored to the specific conditions of landless farmer households in areas vulnerable to land conversion. Such policies could include the establishment of safe zones for agricultural land, subsidies for farmers who maintain agricultural land, and sustainable agricultural development programs that align with local needs. With targeted policies, household and community-level food security is expected to be more effectively preserved. By implementing these measures, landless farmer households in rural areas vulnerable to land conversion can strengthen their food resilience, ensuring they are better prepared to face future food crises independently and sustainably.

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REFERENCES

Alpízar, F., Saborío-rodríguez, M., Martínez-rodríguez, M. R., & Viguera, B. (2020). *Determinants of food insecurity among smallholder farmer households in Central America : recurrent versus extreme weather-driven events*.

Chen, D., Dong, G., Chen, J., & Lv, J. (2018). *Study on the factors affecting the poverty alleviation and relocation of peasant households- based on the survey data in Xinrong District of Shanxi Province*. *77*(Icmcs), 569–574. https://doi.org/10.2991/icmcs-18.2018.117

Dassir, M., Samuel, A., Usman, A., & Nadirah, S. (2021). Resilience Level of Highland and Smallholder Farmers in Developing Various Coping-Based Agroforestry in the Upstream Minraleng Sub-Watershed, Maros District. *Conf. Series: Earth and Environmental Science 921*, 1–13. https://doi.org/10.1088/1755-1315/921/1/012016

Dumasari, D., Dharmawan, B., & Santosa, I. (2020). Optimalisation of Social Cohesion in the Participatory Empowerment of Landless Peasants. *International Journal of Innovation, Creativity and Change*, *14*(5), 311–324. https://www.ijicc.net/images/Vol_14/Iss_5/14520_Dumasari_2020_E_R.pdf

Dumasari, D., & Santosa, I. (2021). The Development of Superior Side Dishes Survival Management in the Household Movement during Pandemic Crisis. *Review of International Geographical Education Online*, *11*(5), 3342–3352. https://doi.org/10.48047/rigeo.11.05.223

Elsahoryi, N., Al-Sayyed, H., Odeh, M., McGrattan, A., & Hammad, F. (2020). Effect of COVID-19 on food security: A cross-sectional survey. *Clinical Nutrition ESPEN*, *40*(xxxx), 171–178. https://doi.org/10.1016/j.clnesp.2020.09.026

Estrada-Carmona, N., Raneri, J. E., Alvarez, S., Timler, C., Chatterjee, S. A., Ditzler, L., Kennedy, G., Remans, R., Brouwer, I., den Berg, K. B. van, Talsma, E. F., & Groot, J. C. J. (2020). A model-based exploration of farm-household livelihood and nutrition indicators to guide nutrition-sensitive agriculture interventions. *Food Security*, *12*(1), 59–81. https://doi.org/10.1007/s12571-019-00985-0

Fontainha, E., & Lazzaro, E. (2019). Cultural and creative entrepreneurs in financial crises: Sailing against the tide? *Scientific Annals of Economics and Business*, *66*(SI1), 73–89. https://doi.org/10.2478/saeb-2019-0022

Hu, C., & Jiayun, D. (2023). Measuring livelihood resilience of farmers and diagnosing obstacle factors under the impact of COVID-19 in Jiangsu Province, China. *Frontiers in Sustainable Food Systems*, *7*, 01–14. https://doi.org/https://doi.org/10.3389/fsufs.2023.1250564

Izzah, I. Y. U., & Jazilah, H. (2022). Farmer Resilience in Maintaining Agricultural Production During the COVID-19 Pandemic: Study in Solokuro Subdistrict, Lamongan. *Society*, *10*(1), 126–140. https://doi.org/10.33019/society.v10i1.335

Josefsson, J., Berg, Å., Hiron, M., Pärt, T., & Eggers, S. (2017). Sensitivity of the farmland bird community to crop diversification in Sweden: Does the CAP fit? *Journal of Applied Ecology*, *54*(2), 518–526. https://doi.org/10.1111/1365-2664.12779

Knorr, D., & Khoo, C. S. H. (2020). COVID-19 and food: Challenges and research needs. *Frontiers in Nutrition*, *7*(December), 1–5. https://doi.org/10.3389/fnut.2020.598913

Kurnaedi, D., Purnomo, E. P., Salsabila, L., Setiawan, D., Fathani, A. T., & Agustiyara. (2021). Strengthening Food Security during the Covid-19 Pandemic: Case Study in Temanggung District, Central Java Province, Indonesia. *IOP Conference Series: Earth and Environmental Science*, *837*(1), 1–9. https://doi.org/10.1088/1755-1315/837/1/012005

Memon, Q. U. A., Wagan, S. A., Chunyu, D., Shuangxi, X., & Jingdong, L. (2019). An analysis of poverty situation of landless peasants: Evidence from Sindh Pakistan. *Journal of Poverty*, *23*(4), 269–281. https://doi.org/10.1080/10875549.2018.1550462

Mudzielwana, R. V. A., Mafongoya, P., & Mudhara, M. (2022). An Analysis of Livelihood-Diversification Strategies among Farmworker Households: A Case Study of the Tshiombo Irrigation Scheme, Vhembe District, South Africa †. *Agriculture (Switzerland)*, *12*(1866), 1–17. https://doi.org/10.3390/agriculture12111866

Mwololoa, Muli, H. N., Makau, Jonathan, Githinjib, & Mugure, L. (2022). Determinants of farmer empowerment in agriculture in Kenya: A Tobit approach. *Heliyon*, *8*, 1–8.

Ofuoku, A. U., & Ekorhi-Robinson, O. I. (2018). Social inclusion of landless farmers in extension services in delta state, Nigeria: Implications for agricultural development. *Open Agriculture Journal*, *3*(1), 226–235. https://doi.org/10.1515/opag-2018-0024

Sabin, S., Amani, A., Paraison, G., Brito, D. L., Vergara, M. M., Santos, G. F., Chin, C., & Morikawa, R. (2020). Smallholder farmer resilience: a multi-year multidimensional study in the Dominican Republic and Haiti. *Trees, Forests and People*, *7*(100189), 774–774. https://doi.org/10.1007/978-3-319-95675-6_300076

Sekabira, H., Tepa-Yotto, G. T., Ahouandjinou, A. R. M., Thunes, K. H., Pittendrigh, B., Kaweesa, Y., & Tamò, M. (2023). Are digital services the right solution for empowering smallholder farmers? A perspective enlightened by COVID-19 experiences to inform smart IPM. *Frontiers in Sustainable Food Systems*, *7*, 1–10. https://doi.org/10.3389/fsufs.2023.983063

Sinha, D. (2021). Hunger and food security in the times of Covid-19. *Journal of Social and Economic Development*, *0123456789*. https://doi.org/10.1007/s40847-020-00124-y

Authors' Contribution

All 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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