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Home Garden Areas (KRPL) and Food Insecurity in Indonesia

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Abstract

Food security is essential to ensure the availability, access, and consumption of sufficient, nutritious, and safe food for all people. The Home Garden Areas or Kawasan Rumah Pangan Lestari (KRPL) in the local language is one of the government's food security programs. The number of KRPLs has steadily increased between 2017 and 2021. However, the level of food insecurity has risen since 2020. Variations in the number of KRPLs from 2017 to 2021 were accounted for in this study to estimate their impact on food insecurity. This study recommends that KRPL be accompanied by other policies, particularly poverty reduction programs in food insecurity interventions, at least in regencies/municipalities with "high" and "very high" food insecurity categories. The magnitude and significance of the relationship between KRPLs and food insecurity were estimated using this study's panel data analysis techniques with the Fixed Effect method. According to the simulation results, an additional 157 KRPL areas are required in each regency and municipality to bring the SaMaPua regions into the "moderate" food insecurity category. The total number of KRPL needed for the SaMaPua region becomes 14.915 areas. The average food insecurity in Java-Bali from 2017 to 2021 is nearly half that of non-Javanese and Bali food insecurity. The maximum value of food insecurity in non-Java and Bali areas is 83,6 percent, indicating that there are still areas with "very high" food insecurity outside Java-Bali. According to the estimation results, KRPLs significantly reduce food insecurity after one year, particularly in the Java and Bali regions.

Keywords: Home Garden; KRPL; Food Insecurity; Regencies/Municipalities

Introduction

While global food production has steadily increased since 1961, around 821 million people remained malnourished in 2019, due to limited access to food (Mbow et al., 2019; in Ngarava, 2022). This situation is intensified by the prevalence of stunting among 151 million under-five children and iron deficiency in 613 million women aged 15 to 49. Furthermore, over 2 billion people worldwide are estimated to suffer from micronutrient deficiencies, and one-third of the population in developing countries experiences food insecurity (Perez-Escamilla, 2017).

Addressing the growing challenges of food production and food insecurity requires multiple strategies. Home food gardening is perceived as a successful strategy that can contribute towards increasing food access. Although these gardens have changed over time with urbanization, they have long been a vital source of food for households worldwide (Gwacela et al., 2024). In many developing countries, such as those in Africa and Latin America, research on home gardens is generally related to food insecurity. While in developed countries, often highlight the informal nature of home gardens, as well as their enclosed and private nature (Gray et al., 2014).

Study in South Africa has shown that home gardens have proven effective in enhancing food security and resilience especially among impoverished communities. In contrast, successful initiatives promoted food sovereignty, community participation, and

access to appropriate resources. Overall, evidence shows that well-supported home and community gardens can significantly reduce hunger and malnutrition despite challenges such as drought and weakened social capital (Carstens, 2021). Food insecurity is strongly associated with both stunting and severe stunting, and effective interventions must therefore prioritize children living in food-insecure households (Agho et al., 2018).

Given the growing evidence that home gardens significantly improve food availability, dietary diversity, and household-level utilization, it becomes essential for the government to collaborate with non-governmental organizations to expand and promote home-garden practices as a strategic approach to enhancing food security and building resilience during challenging periods (Gebreigziabher et al., 2025). Building on this evidence, recent empirical findings further demonstrate the tangible impacts of expanding home-garden initiatives on household nutrition and food security.

The study reported a 21% decline in food insecurity from 2019 to 2022, largely driven by a 12% increase in home gardens that enhanced crop production and harvests. Dietary habits also improved during this period, with minimum diet diversity reaching 41% overall 62% among female-headed households, 41% among households with disabilities, and 67% among other vulnerable groups (Shrestha, 2025). Home gardens help families improve their financial situation, and farmers gain additional benefits by relying on family labor that significantly reduces production costs (Afreen, 2021).

Moreover, the typical Javanese home-garden structure in rural villages continues to exist and is still widely utilized by the community, demonstrating its enduring cultural and economic importance. This traditional system not only supports household livelihoods but also strengthens local resilience by providing accessible food and income sources for families across generations (Adityo, 2025). The traditional home gardens were once dominated by a wide variety of annual and perennial crops, but market-oriented economic development has significantly transformed their structure and functions. As a result, although household incomes have increased for families who shifted toward more commercial home-garden practices, many important ecological and socio-cultural roles of these systems have sharply declined (Prihatini, 2018).

Furthermore, although the value of home gardens in conserving plant genetic resources is well recognized, these ongoing changes create a substantial risk of losing local genetic diversity, particularly when traditional plant materials are replaced by high-yielding modern cultivars that threaten long-standing biodiversity (Korpelainen, 2023). Overall, home gardens can enhance household food security, improve the dietary quality of both men and women, and generate income gains among vulnerable farming populations, although they may still be insufficient to significantly improve child dietary quality and anthropometric outcomes (Ogutu, 2023).

Nevertheless, evidence from rural South Africa demonstrates that home gardens function as an effective livelihood strategy, and thus their long-term sustainability requires stronger government and NGO support, including subsidized inputs, targeted training programs, and active youth engagement to ensure broader and more equitable nutritional and economic benefits (Msengana, 2025). The issue of global food security is escalating due to concurrent factors, including population growth, climate change, and the degradation of productive land. Many nations are confronting significant challenges in ensuring stable, safe, and sustainable access to food for their entire populace.

Amidst these compounding pressures, small-scale, household-based agricultural models are increasingly being promoted as a vital strategy. This approach is instrumental in enhancing food self-sufficiency and effectively mitigating reliance on external supply chains. In Indonesia, the home food garden strategy is promoted through the Sustainable Home Food Area (*Kawasan Rumah Pangan Lestari*, *KRPL*) program. This program has

been implemented since 2010, with reducing food insecurity as the main objective. Since Indonesia's food insecurity has increased since 2020, KRPL, a government-developed national food security program, must be able to help reduce food insecurity.

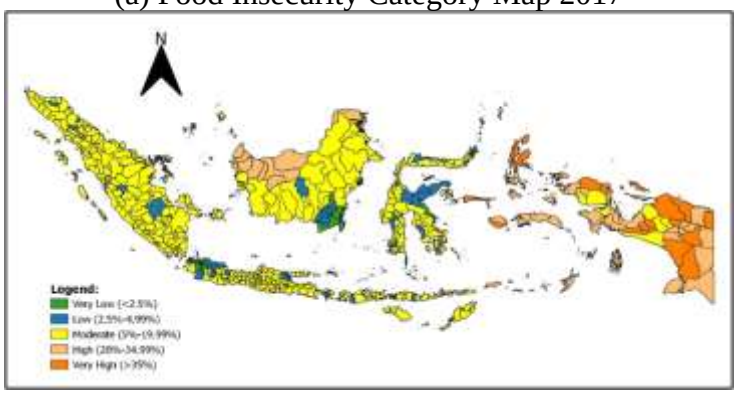
Therefore, it is essential to research how KRPL affects food insecurity in municipalities and regencies. Considerable research has been conducted on KRPL initiative as a strategy to combat food insecurity, though most studies has focused on specific local area (Rahayu et al., 2021; Kurniawan et al., 2018; Raisa et al., 2021). The implementation of KRPL has been regulated in several regulations, including Law Number 18 of 2012 concerning Food, Law Number 41 of 2009 concerning the Protection of Sustainable Food Agricultural Land, and Government Regulation Number 17 of 2015 concerning Food Security and Nutrition.

Implementation of the KRPL involves several levels, with primary responsibility resting with the National Food Agency. The primary task of the Sustainable Food Home Area (KRPL) is to empower the community to make optimal use of the yard to meet diverse, nutritious, balanced, and safe household food needs. Study in East Java Province has shown that the implementation of KRPL in several villages, like Sumberdadi and Wates Villages (Tulungagung Regency), Karangrejo Village (Magetan Regency), and Guyung Village (Ngawi Regency) reduced household grocery expenditures and support the development of small and medium-sized enterprises in the villages (Nailufar et al., 2021).

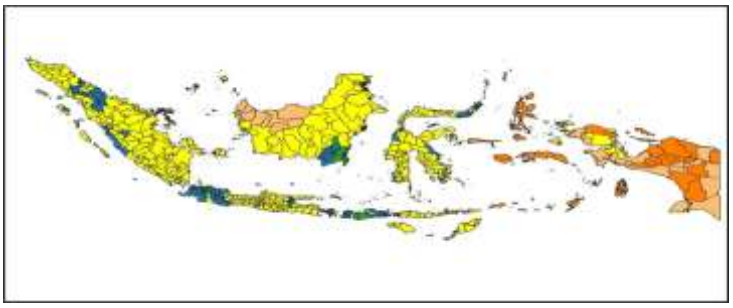
The optimization of KRPL in mitigating food insecurity during the COVID-19 pandemic in Bulu Kamase Village, Sinjai Regency, South Sulawesi Province showed that KRPL met household food needs, thereby reducing food insecurity during the pandemic (Raisa et al., 2021). Similarly, study in Surakarta city, revealing a positive correlation between the effectiveness of KRPL implementation and household welfare, which in turn reduced food insecurity (Kurniawan et al., 2018). The empirical review showed that growing KRPL plays a significant role in reducing food insecurity, which is consistent with previous studies on home gardens.

Therefore, the hypothesis in this study is that the growth of KRPL is negatively associated with food insecurity, whether at the national level, district and municipal level, or in village and urban village level. In the Indonesian context, these global challenges are manifested through food price fluctuations, dependence on the import of specific commodities, and the shrinking of agricultural land due to rapid urbanization. This prevailing situation necessitates a novel, more adaptive, and directly community-empowering approach. This is where the KRPL/ Sustainable Food Home Area) the program demonstrates strong relevance.

(a) Food Insecurity Category Map 2017



(b) Food Insecurity Category Map 2019



(c) Food Insecurity Category Map 2021

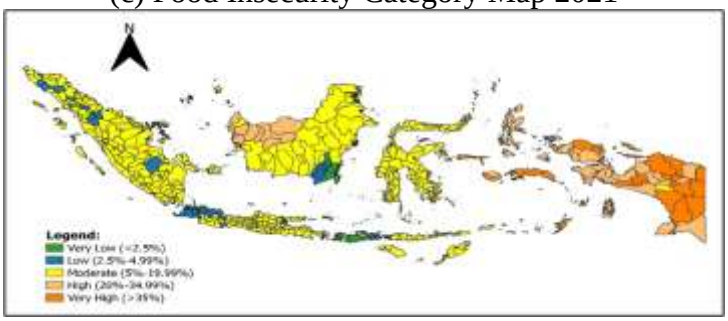


Figure 1. Indonesia's Food Insecurity Category Map Based on PoU
(Source: Processed data of the National Food Agency, 2022)

It offers a localized solution to a global issue by capitalizing on home gardens and yards as a source of nutritious food, thereby increasing dietary diversification and strengthening family-level food resilience. Understanding the classification of food insecurity based on PoU is essential for identifying priority areas for intervention. This categorization helps direct programs like KRPL to regions where food insecurity is more severe. Figure 1 highlights a sharp increase in food insecurity across eastern Indonesia in 2021, with many areas shifting from "low" to "moderate," "moderate" to "high," and parts of Papua reaching "very high." Notably, some regions in West Kalimantan have consistently remained in the "high" category.

Meanwhile, Papua Island is consistently dominated by "high" and "very high" food insecure areas. The food insecurity category is divided into the National Food Agency's category division. Regions with PoU above 35 percent are categorized as having "very high" food insecurity. Regions with PoU 20 percent to 34,99 percent are in the "high" category of food insecurity, 5 percent to 19,99 percent are in the "moderate" category, 2,5 percent to 4,99 percent are in the "low" category of food insecurity, and areas with PoU less than 2,5 percent are in the "very low" category. Based on the introduction above, it is interesting to examine: How do variations in the number of KRPL areas influence food insecurity across regencies and municipalities in Indonesia? The hypothesis in this study is that the number of KRPLs is negatively correlated with food insecurity levels.

Method

This study used quantitative methods to determine the magnitude of the relationship between KRPL and food insecurity as measured by PoU. The data is from all regencies and municipalities (514 regencies and municipalities) in Indonesia from 2017 to 2021, allowing panel data regression models to be used. The econometric model employed in this study is as follows: $FI_{it} = \alpha + \beta\ KRPL_{it-1} + \gamma\ X_{it} + \delta\ geo_{it} + \theta_t + \lambda_I + \lambda_{it}$ The magnitude of the relationship between the number of KRPL areas and food insecurity in regencies and municipalities is expressed by the coefficient β. The X_{it} vector is a set of socio-economic control variables for the regency/municipality i in the year t. The vector of geo_{it} are geographic control variables in the regency/municipality i in the year

of t. A statistical significance level was also obtained from the estimation results as a result of hypothesis testing, with significance levels of 1%, 5%, and 10%. The STATA® statistical application version 16.1 was used for the estimation process.

Results and Discussion

According to data from the National Food Agency, 11.085 KRPL areas were grown in Indonesia between 2017 and 2021. A total of 11.023 KRPL areas have been transferred to local governments. Meanwhile, the National Food Agency and its respective provincial governments oversee 62 KRPL areas. The number of KRPLs has increased by more than six times between 2017 and 2021. The most significant addition will be 3.469 Areas in 2021. These numbers demonstrate the government's commitment to the development of KRPL. Figure 2 depicts the number of KRPL areas in Indonesia from 2017 to 2021. The most notable surge occurred between 2020 and 2021, a period that coincided with the COVID-19 pandemic, when household-level food production became increasingly important in mitigating disruptions to food supply chains. This upward trend reflects the government's intensified efforts to strengthen local food systems

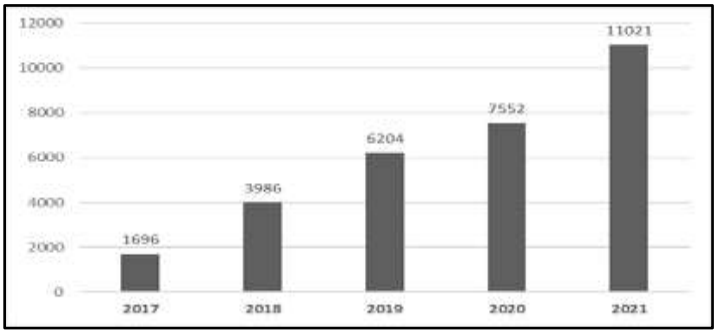


Figure 2. Number of KRPLs in Indonesia, 2017-2021 (Areas)
(Source: Processed data of the National Food Agency, 2022)

The largest number of KRPL areas was found in Java-Bali, followed by Sumatra Island, which had over 3,000 KRPL areas by 2021 (see Table 1). This condition could be because the number of regencies and municipalities on Sumatra and the islands of Java and Bali meet the priority criteria for the growth of new KRPLs more than other islands.

Table 1. Number of KRPLs in Each Major Island, 2017-2021 (Areas)

Food Insecurity's Category	The Number of KRPL Grown					Per Category's Total
	2017	2021	2022	2023	2024	
Very Low & Low	303	469	429	198	580	1979
	(96)	(110)	(129)	(88)	(78)	
Moderate	1245	1527	1436	1061	2556	7825
	(354)	(340)	(317)	(357)	(369)	
High & Very High	148	294	353	89	333	1217
	(64)	(64)	(68)	(69)	(67)	
per Year's Total	1696	2290	2218	1348	3469	
	(514)	(514)	(514)	(514)	(514)	

Source: Processed data of the National Food Agency (2022)

The Sumatra Island has 154 regencies and municipalities, while the Java and Bali Islands combined have 127. Kalimantan and Sulawesi each have 56 and 81 regencies and municipalities, respectively. In Papua Island, KRPL areas increase by 101,55 percent each year, the highest average compared to other islands, with as many as 42 regencies and municipalities. The most rapid growth is observed in Papua, Nusa Tenggara, Maluku, and

Kalimantan, each showing average increases above 78%, with Papua exceeding 100%. This pattern indicates that KRPL development is not only concentrated in densely populated regions but is increasingly penetrating historically underserved and food-insecure areas. Despite the growth of KRPLs, food insecurity in Indonesia decreased from 2017 to 2019 but rose again between 2020 and 2021, coinciding with further expansion of KRPLs.

Table 2 summarizes the increase in KRPLs by regencies/municipalities' food insecurity category from 2017 to 2021. Table 2 shows that even when the number of KRPLs grown in regions with "moderate" food insecurity is excluded, the number of KRPLs grown in regions with "low" and "very low" food insecurity is still relatively higher than in regions with "high" and "very high" food insecurity. This phenomenon may be due to the role of KRPLs' growth in areas with "low" and "very low" food insecurity being more significant than in areas with "high" and "very high" food insecurity categories.

Table 2. Number of KRPLs Grown

Islands	Year					Average Increase (%)
	2017	2021	2022	2023	2024	
Sumatera	550	1.220	1.793	2.199	3.081	57,88
Java & Bali	507	1.043	1.630	1.967	3.276	62,31
Nusa Tenggara	100	282	531	633	869	81,70
Kalimantan	136	391	593	755	1.113	78,47
Sulawesi	283	632	920	1.213	1.662	59,44
Maluku	57	173	256	286	435	78,83
Papua	63	245	481	499	585	101,55
Total	1.696	3.986	6.204	7.552	11.021	74,31

According to Regencies/Municipalities Food Insecurity Category

Note: The number in parentheses is the number of regencies/municipalities

Source: Processed data of the National Food Agency (2022)

A scatter plot diagram constructed from KRPL and PoU data can be used to obtain an overview of the correlations between KRPL and food insecurity (see Figure 3). A line of fitted values is added to the diagram. The slope of the line predicts the direction of the correlations between the two variables. Figure 3 shows that the direction of the correlations between food insecurity and KRPL is negative, marked by a line of fitted values that decrease from left to right. The line's slope appears close to becoming a ramp, implying a low correlation coefficient. Although the correlation is negative, its slope suggests that KRPL alone cannot substantially alter structural determinants of food insecurity.

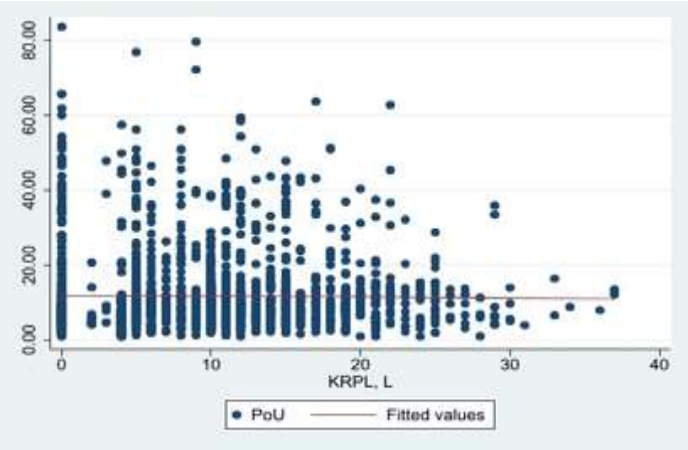


Figure 3. PoU and KRPL Correlations
(Source: Processed data of the National Food Agency, 2022)

Table 3. Variables' Descriptive Statistics

Variables	Observations	Min.	Max.	Mean	Std. Deviation
Prevalence of Undernourishment *(PoU)*	2570	0,6	83,62	11,58	10,48
Number of KRPL Areas *(KRPL)*	2570	0	89	11,85	9,37
GRDP at Constant Price of 2010 *(GRDP)*	2570	120.555,83	460.081.046,07	20.986.817,32	45.807.881,21
Poverty Index *(P0)*	2570	1,68	43,65	12,3	7,71
Years of Schooling *(YoS)*	2570	0,71	12,83	8,21	1,65
Life Expectancy *(LifeX)*	2570	54,6	77,73	69,33	3,5
Population *(Pop)*	2570	13.785	6.088.233	521.267,44	639.115,87
Average Rainfall In a Year (Rain)	2565	0	6.608,50	3.497,36	1.123,54

Note: The dependent variable is PoU. The primary independent variable is KRPL. PoU and KRPL data are sourced from the National Food Agency. The Central Statistics Agency (BPS Indonesia) is the data source on GRDP, Poverty Index, Average Years of Schooling, Life Expectancy, and Population Numbers. Rainfall data is sourced from PERSIANN-CCS (CHRS).

Table 3 shows the data's descriptive statistics for each variable. The data used in this study are panel data for the years of 2017-2021 (5 years) at the regency and municipality levels. The total number of observations is 2570 for five years, or 514 every year, which is the number of all regencies and municipalities in Indonesia. No data on the

average rainfall was obtained for the Kepulauan Seribu Administration Regency (DKI Jakarta Province), so the number of observations was reduced to 2565 (513 regencies/cities). Food insecurity in the regions ranged from 0,6 percent to 83,62 percent, with an average of 11,58 percent.

This statistic means that from 2017 to 2021, the majority of regions in Indonesia were "moderate" food insecurity, as shown in Figure 2, where the majority of areas are yellow. The number of KRPL areas in each region varies between 0 and 89, with an average of 11,85. Thus, the average region has 12 KRPL areas, but some regencies or municipalities have been without KRPL until 2021. As shown in Table 1, most of the KRPLs are concentrated in Sumatra and Java-Bali Islands. So, it can be concluded that the regencies or municipalities without KRPL areas are outside the Sumatra and Java-Bali regions.

The KRPL plays a crucial role in enhancing both food availability and food access at the household level. By utilizing household yards to cultivate vegetables, fruits, medicinal plants, and plant-based protein sources, KRPL directly increases the daily food supply without relying entirely on market sources, aligning with the FAO definition of food availability, which encompasses domestic production, stocks, and effective distribution. Moreover, KRPL reduces household expenditure on food and provides physical access to nutritious products, thereby enabling vulnerable families to obtain sufficient nutrition and improve dietary quality.

Through this dual function, KRPL sustainably strengthens food security by simultaneously improving both the availability and access to food. A fixed-effect panel data analysis method was used to estimate the correlations between KRPL and food insecurity in regencies/municipalities. The findings of the estimation of the correlations between KRPL and food insecurity are summarized in Table 4. The independent variable of interest is the number of KRPLs in regencies and municipalities. Meanwhile, as measured by PoU at the regencies and municipalities levels, food insecurity is used as the dependent variable.

The greater a regency/municipality's PoU percentage, the greater the regency/municipality's food insecurity. A year-fixed effect is applied to each column. Table 4 shows the estimated results of growing KRPLs after one year, negatively associated with food insecurity in regencies and municipalities for all columns. Column (1) shows that each increase in 1 KRPL area is associated with a 0,0691 percent decrease in regencies and municipalities' PoUs. However, this result is biased because it only uses one independent variable and does not consider the influence of other factors on regencies and municipalities' food insecurity.

The KRPL coefficient (-0.0374) has relatively small economic significance, although it is statistically significant. Several control variables must be included for subsequent estimation, as shown in columns (2) to (4). When regencies and municipalities' economic variables are included in the model, the coefficient value decreases to 0,0655, and the R2 increases. When social variables are added to the model in column (3), the coefficient magnitude rises to 0,0719, and R2 rises to 0,1473.

Table 4. Estimated Correlations Between KRPL and Food Insecurity Results

	Dependent Variables: PoU				
	(1)	(2)	(3)	(4)	(5)
$KRPL_{it-1}$	-0,0691***	-0,0655***	-0,0719***	-0,0748***	-0,0374*
	(0,0222)	(0,0218)	(0,0219)	(0,0219)	(0,0209)

Economic Variables	No	Yes	Yes	Yes	Yes
Social Variables	No	No	Yes	Yes	Yes
Geographic Variables	No	No	No	Yes	Yes
Year Fixed Effect* Dummy Islands	No	No	No	No	Yes
Overall R-sq	0,0015	0,373	0,1473	0,1465	0,3234
Observations	2056	2056	2056	2052	2052
Regencies & Municipalities	514	514	514	513	513

Note: PoU dependent variables as a proxy for food insecurity. Economic Variables consist of GRDP on constant prices and the poverty index. Social Variables consist of the average years of schooling, life expectancy, and population. Geographical Variables consist of the average rainfall in a year and a set of dummy Islands. Data on food insecurity and KRPL are sourced from the National Food Agency. Data on GRDP, poverty index, years of schooling, life expectancy, and population are sourced from the Central Statistics Agency. Rainfall data is sourced from PERSIANN-CCS (CHRS). All columns involve year-fixed effects. The standard errors are written in parentheses. ***, **, * signifies statistically significance at the level of 1%, 5%, 10%, respectively.

For Indonesia, as an archipelagic country, it is necessary to control the variation of fixed island characteristics. Therefore, column (4) adds a geographical variable consisting of sets of dummy islands. Geographical variables also include continuous variables on the average rainfall of regencies and municipalities in a year. The coefficient magnitude increased to 0,0748 as a result of the estimation. Furthermore, to account for the variation in each island's characteristics that were not observed during the observation period, the interaction of the year-fixed effect with the islands' dummies was added in column (5).

The estimation results showed a decrease in the coefficient value to 0,0374 with an increase in R2. The final estimates in column (5) of Table 4 are interpreted as the growth of 1 KRPL area contributing to a 0,0374 percent reduction in food insecurity after one year, which is statistically significant at the 10% level. Appendix 1 contains the complete estimation results. According to Appendix 1, the poverty variable (P0) had a more statistically significant relationship than KRPL. P0 positively correlates with food insecurity, with a coefficient magnitude of 1,2144. The estimated results were interpreted as a 1% reduction in poverty correlated with a 1,2144 percent decrease in food insecurity, which was statistically significant at the 1% level.

These estimation results can be interpreted to mean that, compared to growing KRPLs, a significant decrease in the poverty rate substantially reduces food insecurity. In general, these findings are consistent with the empirical reviews of Home Garden and KRPL, which found that Home Garden and KRPL have a role in decreasing food insecurity. To statistically demonstrate the suitability of lag used in the estimation model with KRPL conditions in Indonesia, the estimated correlations between KRPL and food insecurity during the growth period are compared to the year after growth. Table 5 shows the estimated results for each period. Both periods were estimated using Fixed-Effect,

with lag 1 (KRPLit-1) applied to the KRPL variable for one year after growth and without lag (KRPLit-0) for the estimated period when KRPL was grown. As in the previous section, dependent, independent, and control variables are the same.

Table 5. Comparison of KRPLit-0 and KRPLit-1 Estimations

	Dependent Variable: PoU	
	$KRPL_{it-0}$	$KRPL_{it-1}$
	(1)	(2)
β	-0,0121 (0,0113)	-0,0374* (0,0209)
Control Variables	Yes	Yes
Year Fixed Effect* Dummy Islands	Yes	Yes
Overall R-sq	0,376	0,3234
Observations	2565	2052
Regencies & Municipalities	513	513

Note: The Control Variables consist of GRDP on constant prices, poverty index, average years of schooling, life expectancy, population, average rainfall in a year, and sets of dummy islands. All estimations involve years-fixed effect. ***, **, * signifies statistically significance level at 1%, 5%, 10%, respectively. Standard Errors are in parentheses.

The estimation results in Table 5, columns (1) and (2), both shows negative correlations between KRPL and food insecurity. Whereas KRPLit-0 is not statistically significant, KRPLit-1 is significant at the 10% level. The magnitude of the KRPLit-1 coefficient (0.0374) is more than twice that of KRPLit-0 (0.0121). To conclude, using lag on the KRPL variable in the model improves statistical significance and coefficient magnitude. To assess KRPL's varying impact on food insecurity, we grouped the data into five island categories Sumatra; Java-Bali; Kalimantan; Sulawesi; and SaMaPua (Nusa Tenggara, Maluku, Papua) based on observation counts and territorial similarities, then ran separate estimations for each. Table 6 presents the comparative results.

The estimation results for each group (columns 1-5) shows negative correlations between KRPL and regencies/municipalities' food insecurity in all groups. Only the results in column (2), Java-Bali, are statistically significant. These findings show that growing one KRPL area in Java-Bali is associated with a 0,0262 percent decrease in regencies and municipalities' food insecurity after one year, which is statistically significant at the 10% level.

Table 6. Estimated Results of the KRPL Correlations with Food Insecurity On Indonesia's Big Islands

	Dependent Variable: PoU				
	Sumatera	Java & Bali	Kalimantan	Sulawesi	SaMaPua
	(1)	(2)	(3)	(4)	(5)
$KRPL_{it-1}$	-0,0288 (0,0238)	-0,0262* (0,0137)	-0,0058 (0,0498)	-0,0091 (0,0364)	-0,0954 (0,1014)
Control Variables	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes

Overall R-sq	0,007	0,1642	0,0942	0,0698	0,0522
Observations	616	508	224	324	380
Regencies & Municipalities	154	127	56	81	95

Note: SaMaPua consists of Nusa Tenggara, Maluku, and Papua. The Control Variables consist of GRDP on constant prices, poverty index, average years of schooling, life expectancy, population, and yearly rainfall. All estimates involve years-fixed effect. ***, **, * signifies statistically significance level at 1%, 5%, 10%, respectively. Standard Errors are in parentheses.

Meanwhile, other estimation results cannot be concluded because the relationship between KRPL and food insecurity on other islands is not statistically significant. The estimation results, which are statistically significant only in Java-Bali, are most likely explained by the fact that the average level of food insecurity in Java-Bali is lower than in the non-Java and Bali islands. Table 7 compares the average level of food insecurity in Java-Bali to that of the non-Java and Bali regions.

Table 7. Comparison of Food Insecurity (PoU) in Java-Bali To Non-Java & Bali Regions from 2017 to 2021

Regions	PoU			
	Min.	Max.	Mean	Std. Deviations
Java & Bali	0,87	19,80	7,55	4,32
non-Java & Bali	0,60	83,62	12,91	11,53

Source: Processed data of the National Food Agency (2022)

According to Table 7, the average food insecurity in Java-Bali from 2017 to 2021 is nearly half that of non-Javanese and Bali food insecurity. The maximum value of food insecurity in non-Java and Bali areas is 83,6 percent, indicating that there are still areas with "very high" food insecurity outside Java-Bali. Meanwhile, the highest food insecurity value in Java-Bali is 19,80 percent, indicating that the areas with the highest food insecurity in Java-Bali are classified as "moderate" food insecurity. As previously stated, there is a negative correlation between KRPL and regencies/municipalities' food insecurity.

This correlation implies that an increase in KRPL areas corresponds to a decrease in regencies' and municipalities' food insecurity. In other words, differences in food insecurity status are influenced by the variety in the number of KRPL areas between regions. Various government and non-government program interventions are needed to supplement efforts to reduce national food insecurity, particularly in areas with "high" and "very high" food insecurity, such as SaMaPua (Figure 2). These efforts are expected to bring SaMaPua into the "moderate" food insecurity category, as do most Indonesian regions.

One possible intervention is to increase the number of KRPL areas in SaMaPua. The average PoU SaMaPua for the 2021 period is 25,85 percent, putting it in the category of "high" food insecurity. Using the regression coefficient estimated in the previous section (-0,0374), the number of KRPL areas that must be grown in the SaMaPua regions to be classified as having "moderate" food insecurity (maximum PoU value = 19,99 percent) can be calculated. According to the simulation results, an additional 157 KRPL

areas are required in each regency and municipality to bring the SaMaPua regions into the "moderate" food insecurity category. As a result, the total number of KRPL needed for the SaMaPua region becomes 14.915 areas. In comparison, the government only intended to grow KRPL in as many as 4.500 areas throughout Indonesia in 2021. According to the Chief of the Food Security Agency's document (2019), the amount of government assistance for the growth phase of the KRPL area is determined by the predetermined regional zone. Zone 2 includes West Nusa Tenggara Province, while Zone 3 includes East Nusa Tenggara Province, Maluku Island, and Papua Island. The government would contribute 50 million Rupiah to the growth of each KRPL in Zone 2 and 65 million Rupiah to Zone 3. Thus, growing 14.915 KRPL in the SaMaPua area is equivalent to an Rp 945.925.000.000,- government investment.

Conclusion

Efforts to reduce poverty are therefore more impactful in addressing food insecurity than expanding KRPL areas alone" Fixed-effects analysis revealed a statistically significant relationship between KRPL development and food security at both regency and municipality levels, where the addition of one KRPL area is associated with a 0.0374 percent decrease in food insecurity after one year; moreover, this impact underscores the importance of integrating poverty-alleviation policies, strengthening food literacy, and reinforcing local institutions as key strategies for ensuring the long-term success of KRPL. KRPL contributes significantly, yet within certain limitations, to the reduction of food insecurity. The combination of poverty-alleviation policies, enhanced food literacy, and strengthened local institutions constitutes a central determinant of KRPL's future success.

References

Adityo, & Shibata, Y. (2024). Transformation Of Traditional Home Garden (Pekarangan) Spatial Structure In Rural Javanese Garden Houses Compound, Indonesia. *Journal of Asian Architecture and Building Engineering*, *24*(5), 4148-4171.

Afreen, Seyida, S. M. M., Begum, S. L. R., & Himaya, S. M. M. S. (2021). Review of Home Garden as an Economic Approach. *Sri Lankan Journal of Technology*, *SLJoT 2021*, *2*(2), 20-26.

Agho, K. E., Mukabutera, C., Mukazi, M., Ntambara, M., Mbugua, I., Dowling, M., & Kamara, J. K. (2018). Moderate And Severe Household Food Insecurity Predicts Stunting And Severe Stunting Among Rwanda Children Aged 6-59 Months Residing In Gicumbi District. *Maternal & Child Nutrition*, *15*(3), e12767.

Carstens, G., Hay, R., & Laan, M. V. D. (2021). Can Home Gardening Significantly Reduce Food Insecurity In South Africa During Times Of Economic Distress?. *South African Journal of Science*, *117*(9-10).

Chief of Food Security Agency (2019). *Decree of the Chief of Food Security Agency Number 87 / KPTS / RC.110 / J / 12/2019 concerning Technical Guidelines for Strengthening Household Food Security through Home Garden Areas in 2020*. Food Security Agency-Ministry of Agriculture of the Republic of Indonesia: Jakarta.

Gebreigziabher, A., Beyene, A., Abraha, Z., Zeweld, W., Negash, T., Gebreslassie, L., Endrias, G., Hagos, T., Mamoy, G., Redae, A., Gebrehiwot, A., & Gebremicheal, W. (2025). Impact Of Home Garden Practices On Urban Households Food Security Dimensions During The Tigray War: The Case Of Mekelle City, Ethiopia. *International Journal of Vegetable Science*, *31*(4), 439-467.

Gwacela, M., Ngidi, M. S. C., Hlatshwayo, S. I., & Ojo, T. O. (2024). Analysis Of The Contribution Of Home Gardens To Household Food Security In Limpopo Province, South Africa. *Sustainability*, *16*(6), 2525.

Gray, L., Guzman, P., Glowa, K. M., & Drevno, A. G. (2014). Can Home Gardens Scale Up Into Movements For Social Change? The Role Of Home Gardens In Providing Food Security And Community Change In San Jose, California. *Local Environment*, *19*(2), 187-203.

Karyono, K. (2000). Traditional Homegarden And Its Transforming Trend. *Bionatura*, *2*(3), 218427.

Korpelainen, H. (2023). The Role Of Home Gardens In Promoting Biodiversity And Food Security. *Plants*, *12*(13), 2473.

Kurniawan, A., Susilawati, S., & Iryanti, R. (2018). Kajian Program Kawasan Rumah Pangan Lestari (KRPL) Dalam Upaya Peningkatan Ketahanan Pangan Rumah Tangga Di Kota Surakarta. *Jurnal Pengabdian Magister Pendidikan IPA*, *3*(2), 65-72.

Msengana, B. Z., Naidoo, D. K., Mdoda, L., & Tamako, N. (2025). Contribution of home gardens to household food security in Umzimvubu Local Municipality, Eastern Cape, South Africa. *Cogent Food & Agriculture*, *11*(1), 2565714.

Nailufar, F. D., Yunas, N. S., & Mujiburrohman, M. A. (2021). Sustainable Food House Area Policy To Increase Food Security In The Vulnerable Area. *International Journal Of Research In Business And Social Science*, *10*(5), 216-223.

Ogutu, S. O., Mockshell, J., Garrett, J., Labarta, R., Ritter, T., Martey, E., & Gonzalez, C. (2023). Home Gardens, Household Nutrition And Income In Rural Farm Households In Odisha, India. *Journal of Agricultural Economics*, *74*(3), 744-763.

Ngarava, S. (2022). *The Interconnectedness of Food Availability, Utilization and Access from Sustainable Home-Gardens in Raymond Mhlaba Local Municipality, South Africa*. Switzerland: Springer.

Pérez-Escamilla, R. (2017). Food Security And The 2015–2030 Sustainable Development Goals: From Human To Planetary Health. *Current Developments In Nutrition*, *1*(7), 1-8.

Prihatini, J., Iskandar, J., Partasasmita, R., & Nurjaman, D. (2018). The Impacts Of Traditional Homegarden Conversion Into The Commercial One: A Case Study In Sukapura Village of the Upstream Citarum Watershed, West Java, Indonesia. *Biodiversitas*, *19*(5), 1926-1940.

Rahayu, L., Nadida, A., & Rusimah, S.Y. (2021). Factors Affecting Optimization Of Sustainable Food House Programs Of Accelerating Food Consumption Diversification in Bantul Regency, Yogyakarta, Indonesia. *IOP Conf. Series: Earth and Environmental Science*, *733*, 012122.

Rahayu, L., Nadida, A., & Rusimah, S. Y. (2021). Factors Affecting Optimization Of Sustainable Food House Programs Of Accelerating Food Consumption Diversification in Bantul Regency, Yogyakarta, Indonesia. *IOP Conference Series: Earth and Environmental Science*, *733*(1), 012122.

Raisa, D. M., Ahmad, A., Nurdin, F., Qinayah, M., Alamsyah, R., & Megawati, M. (2021). Optimalisasi Penerapan Rumah Pangan Lestari dalam Penyediaan Sayuran untuk Memperkuat Ketahanan Pangan di Masa Pandemi COVID-19. *Tarjih: Agribusiness Development Journal*, *1*(2), 58-63.

Shrestha, S., Maraseni, T., & Apan, A. (2025). Enhancing Food Security Through Home Gardening: A Case Study in Phoukhoud District, Lao PDR. *Agriculture*, *15*(7), 716.