

The Effect of the Sustainability of Seribu Galon Program on Household Food Security of Women Farmers in Condongcatur, Sleman Regency

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ABSTRACT

The increasing scarcity of agricultural land in Condongcatur Village necessitates the sustained fulfillment of food demands. In this context, the Seribu Galon program was initiated for Women Farmers Group (WFG) to achieve household food security. Sustainability is crucial for guaranteeing the effectiveness of the program and the positive contribution to food security. Therefore, this research aims to assess the sustainability of the Seribu Galon program, identify the influencing factors, and assess the impact on household food security among WFG. Data collection was carried out by interview and observation on 60 members with 12 people drawn from each WFG Teratai Mekar, Lestari, Arum Melati, Dewi Sri, and Ijoro by simple random sampling. The data analysis used the proportion test, multiple linear regression test, and simple linear regression test. The results showed that the sustainability level of most members was high. The average level of sustainability of Seribu Galon Program is 78,72%. Moreover, Seribu Galon program was influenced by age, motivation, as well as role of group and extension workers. The sustainability of the Seribu Galon Program has significant impact on the household food security of women farmers in Condongcatur Village. The research recommends that production and marketing strengthening should be more prioritized to enhance the sustainability program, supported by the role of extension workers in monitoring and providing training support.

INTRODUCTION

The population of Indonesia has consistently shown an upward trend. In 2024, the total population reached an estimated 281.6 million individuals, representing an increase of approximately 25 million over the preceding decade (BPS, 2024). The growth has been accompanied by increasing population

needs and limited food availability. The needs of the population have exacerbated pressure on agricultural resources, as the availability of land and water for food production is decreasing (Subramaniam, 2023). Population expansion creates a dual impact on economic development and food security (Ridwan & Ismail, 2025). In

this context, the food security of an area can be fulfilled when the population possesses physical, social, and economic access to sufficient safe food and quality nutrition (Wardani and Yuliawati, 2023).

Food security is the second goal in the Sustainable Development Goals (SDGs) as it holds significant importance for the community. This extends beyond food availability, including crucial aspects such as utilization, accessibility, and the consistent stability of food supply for the entirety of the population (FAO, 2006). An important effort to promote food security is by urban farming, which uses yard space to increase production (Mahpudin et al., 2024).

Sleman is a peri-urban area that still maintains important agricultural activities in sub-districts such as Depok, Tempel, and Seyegan. However, ongoing infrastructure development and industrial expansion continue to reduce its agricultural land (Kurnianingsih & Rudiarto, 2014). Data from 2017 to 2021 showed that food availability in Sleman Regency remained relatively stable, averaging approximately 137 kilograms per capita per year and around 3,000 kilocalories per capita per day. Conversely, the increase in the number of food-insecure villages from 65 to 100 over the same period suggests that equitable access and distribution of food resources have not yet been fully achieved across villages (Data Kabupaten Sleman, 2022). According to Adji et al. (2024), agricultural land carrying capacity in the Central Sleman area is among the lowest, specifically in Kapanewon Depok, Condongcatur Sub-district. The

area is dominated by built-up land and functions as an economic and industrial center. In this context, 83.20% of the land area in Depok Sub-district covering 3,555 ha has been used for non-agricultural activities (Kecamatan Depok Dalam Angka, 2022).

Condongcatur Village government initiated the Seribu Galon program to support food security in alignment with creating green open spaces. The implementation of Seribu Galon is supported by the utilization of mineral water gallons as planting media, targeted at all hamlets through Women Farmer Groups (WFG). The crops produced from the program are mainly used to fulfill the consumption needs of WFG members at affordable prices, while some of the others are sold directly to the community. The main objective is to achieve household food security while also contributing to waste reduction, urban greening, and yard optimization amid limited urban agricultural land.

Previous studies on home-yard-planting based food security programs, such as Kawasan Rumah Pangan Lestari (KRPL), mostly factors that influence program sustainability. For instance, Purnaningsih & Lestari (2021) found that age, education, income, the role of extension workers, and land conditions were significant factors. Furthermore, Saptana et al., (2021) highlighted the role of planting media availability, seed provision, institutional support, and market access. Similarly, Masti et al. (2024) reported that education, family support, group support, and access to facilities shaped the sustainability level of KRPL in West Sumatra.

According to Sudalmi (2010), the concept of sustainability in agriculture emphasizes the long-term balance of ecological, economic, and social dimensions. Purnaningsih & Lestari (2021) added that the sustainability of yard land usage could be seen from the economic aspect of earning additional income, spending efficiency, the ecological aspect of a green environment and waste management, and the social aspect of empowering housewives. Ruhimat (2015) also emphasized the importance of equal access to information, knowledge, and social networks. A synthesis of these studies shows that sustainability must be understood as a multidimensional concept. The correlation between sustainable agricultural practices and household food security has been demonstrated in a broader rural context rather than in a specific community (Sahraei et al., 2022).

Based on previous studies, internal factors such as age, motivation, and external factors, role of groups, role of extension worker, and chairman group are related to participation and commitment in sustaining community-based agricultural programs. The sustainability of agricultural programs is understood as a multidimensional construct encompassing economic, social, and ecological aspects. This perspective is applied in this study to analyze the Seribu Galon program, which not only contributes to household food provision but also reinforces the continuity of the program itself.

Therefore, this research aims to assess the level of sustainability of the

Seribu Galon program, identify the internal and external factors that influence its sustainability, and examine the impact of program sustainability on household food security among women farmer groups in Condongcatur. This study addresses the existing gap by analyzing the sustainability of the recently introduced Seribu Galon program as a localized innovation designed to strengthen household food security in a peri-urban area.

METHODS

This study employed a quantitative descriptive approach to capture the real conditions of the Seribu Galon program. Descriptive and quantitative methods were used to describe the events of an object or subject of research in real terms (Syahrizal & Jailani, 2023). This research was a survey conducted in five hamlets in Condongcatur Village, namely Soropadan, Gempol, Kentungan, Dabag, and Kaliwaru. The location for this research was determined using the purposive area method. These locations were selected based on the active Participation level of their Women Farmer Groups in Condongcatur village, as reflected by their achievements in various competitions and their continued participation in the Seribu Galon program. Two of these WFG also served as pioneers, having utilized gallon containers as planting media prior to the program implementation. The respective groups were WFG Teratai Mekar, WFG Lestari, WFG Arum Melati, WFG Ijo Royo, and WFG Dewi Sri.

The sample comprised 60 individuals, with 12 people drawn from

each WFG using simple random sampling. The sample size was determined based on Azwar (2015), who stated that a sample size of more than 60 respondents is statistically sufficient to meet the assumption of normal distribution. In this study, each WFG consisted of approximately 15–20 active members and with 12 members per group to ensure adequate representation while maintaining statistical validity. Primary data were collected through interviews and questionnaires, while secondary data were obtained from previous research, stakeholder archives, Condongcatur Village website, and Central Bureau of Statistics (BPS). The procedure for data analysis involved three main methods. First, the level of sustainability of the Seribu Galon program was measured by the proportion test through the following formula:

$$Z_{hit} = \frac{\frac{x}{n} - P_o}{\sqrt{\frac{0.5+(1-P_o)}{n}}}$$

Where x, n, and Po represent the number of women farmers with a high level of sustainability, the total sample of women farmers (60), and the proportion of the population (50%), respectively. H0 was rejected when the value of Z count was > Z table, since 50% of women farmers had a high level of sustainability.

The sustainability level of the Seribu Galon Program is classified into five categories based on 0-100% Likert scale range. Scores of 0-20% are very unsustainable, 21-40% is unsustainable, 41-60% is hesitant, 61-80% is sustainable, and 81-100% is very

sustainable. This classification was developed based on the sustainability framework proposed by Sahraei et al., (2022) which emphasizes that economic, social, and ecological dimensions are interrelated and collectively determine the overall sustainability of agricultural programs.

The hypothesis testing was conducted using a proportion test to determine the proportion of women farmers with a high level of sustainability in the Seribu Galon program. The hypotheses were formulated as follows H₀: P ≤ 50% (It is assumed that less than or equal to 50% of the women farmers have a high level of sustainability). H₁: P > 50% (It is assumed that more than 50% of the women farmers have a high level of sustainability). The 50% threshold was used as a benchmark to assess whether the majority of members demonstrated a high level of sustainability in the program.

Second, multiple linear regression analysis was used to determine the factors influencing sustainability. The regression equation model is $Y = A + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + e$, where Y, A, b₁, b₂, b₃, b₄, b₅, b₆, X₁, X₂, X₃, X₄, X₅, X₆, and e represent constant value, regression coefficients, age, education, motivation, role of women farmers, role of extension workers, role of chairman and error value, respectively. The hypotheses were formulated as follows H₀: The factors of age, education, motivation, the role of extension workers, the role of the chairman, and the role of women farmers have no significant effect on the sustainability level of the Seribu Galon program. H₁:

The factors of age, education, motivation, the role of extension workers, the role of the group leader, and the role of women farmers have a significant effect on the sustainability level of the Seribu Galon program.

Furthermore, simple linear regression analysis was used to determine the sustainability of the Seribu Galon program on the household food security of women farmers. The regression equation model is expressed as $Y = A + bX$, where Y and X represent household food security and the sustainability of the Seribu Galon program with a significance level of 0.05. The following hypotheses were formulated to examine the influence of program sustainability on household food security H_0 : The sustainability level of the Seribu Galon program has no significant effect on household food security. H_1 : The sustainability level of the Seribu Galon program has a significant effect on household food security.

RESULT AND DISCUSSION

Seribu Galon Program and Characteristics of Groups of Women Farmers in Condongcatur Village

The Seribu Galon program was initiated in Condongcatur Village to promote household-level food security through the independent community efforts by adopting used water gallons as planting media. The program was implemented in November 2023, targeting women farmer groups across 18 hamlets. The program was established in response to the increasing waste problem and limited agricultural land, aiming to support

local food security. It has achieved food security, increased household income, and maximized the availability of limited yard space into productive land. The women farmers' groups played a central role in coordinating program activities collectively, from collecting used gallons, maintaining the plants, to harvesting. The program was based on the mutual agreement of each group. Annually, the village government provided infrastructural support, including fertilizers and seeds, to groups actively implementing the program. The characteristics of women farmers in Condongcatur.

Village were determined from internal and external factors. Internal factors originated from an individual who could lead a change. Meanwhile, external factors were from beyond an individual. In this research, the internal factors of group members were age, education level, and motivation, adapted from Purnaningsih & Lestari (2021). External factors included roles of group, chairman, and extension workers.

Table 1 shows the descriptive characteristics of WFG members. For these data, age and education were presented using the most frequent category, while motivation, roles of Women Farmer Groups and extension workers are shown as average scores. Most members were in the early elderly age category of 46–55 years old, which represented the modal group with 47% of the total respondents. The members possessed a high school education, which was the most common level, accounting for 55% of all respondents.

Motivation to participate in the

Table 1. Characteristics of women farmers in Condongcatur

Characteristics of women farmers	Category
Age (x_1)	47%, 46–55 years old
Education (x_2)	55% High school
Motivation (x_3)	75.885%, High motivation
Role of Women Farmers (x_4)	75.57% Frequent
Role of Extension Workers (x_5)	70.29%, Frequent
Role of Chairman (x_6)	82.08%, Frequent

Source: Primary Data Analysis (2025)

Seribu Galon program was relatively high, reflected by a mean score of 75.88%, with participation primarily aimed to enhance connections with extension workers and the broader community.

The role of the group was found to often contributed to the implementation of the Seribu Galon program reflected by a mean score of 75.57% in their involvement in both farming processes and administrative management. Extension workers also provided educational support through training sessions particularly on pest and disease control or application of technology in farming practices, achieving a mean score of 70.29% which is categorized as frequent.

The group chairman, with a mean of 82.08%, often provided direction, motivation, and support to the members. The chairman actively promoted member participation in group meetings and scheduled duties. The chairman's presence was instrumental in guiding the implementation of the Seribu Galon program. This included decision-making in urgent situations, task delegation among members, and resolution of group problems.

The Sustainability of Seribu Galon Program

The implementation of sustainability was a long-term effort including the overall activities carried out through the adoption of home yards using gallon planting media. In this research, sustainability categorized into three dimensions, namely ecological, social, and economic. The results of the data analysis showed that the program achieved a sustainable implementation level of 75.72% across ecological, social, and economic dimensions. This indicated that the Seribu Galon program in Condongcatur achieved a fairly sustainable performance by meeting the dimensions of sustainability. The program continuity has brought positive benefits to members and opened opportunities to reach its main goal of improving household food security.

The highest level of sustainability was observed in the social dimension, at 80.24%. This showed that the Seribu Galon program effectively facilitated stronger relationships. The program supported the local village tradition of *gotong royong* within the community. Community participation was reflected in contributions such as donating used gallons, lending

agricultural tools, and assisting with plant maintenance in the surrounding environment. In the social dimension, the highest level was attributed to the desire to generate broader benefits in the group and the surrounding community. These collective actions enhanced cooperation and mutual trust, thereby reinforcing social cohesion within the group and the broader community. The social dimension of sustainability occurred because there was social equality in accessing information, knowledge and networking relationships (Ruhimat, 2015).

The ecological dimension, with a percentage of 75.85%, showed the farming activities are easier for members. Less productive yard areas were optimized for agricultural activities around the home yards of WFG members and the group demonstration plot by using gallons as planting media. Furthermore, the utilization of used gallons collected from the community reduced plastic waste and supported the concept of recycling in Condongcatur village. This initiative was particularly relevant since Condongcatur has a high number of university students and boarding houses, where single use gallons are commonly used. Although full substitution of plastics is not yet possible without risking food security, the adoption of alternatives with smaller environmental impacts within a clear socio-economic framework should be prioritized. This must be accompanied with efforts in monitoring, innovation, education, and incentives to encourage more sustainable use in agriculture (Hofmann et al., 2023).

The economic dimension at 69.07% indicated that the WFG members perceived benefits from the program's harvests, particularly in reducing the need to purchase vegetables for daily consumption. Additionally, the group income increased due to reduced production costs and supplementary earnings from the sale of crops as documented in annual performance reports. The reduction in production costs was primarily attributed to government assistance in providing seeds and fertilizers, while the use of recycled gallons as planting media further minimized expenses. Profits from crop sales were collectively managed and stored in the group's fund, which was distributed to members annually. Langellotto & Gardener (2014) reported that home vegetable gardens generally provide a post-harvest value exceeding production costs, particularly when labor is excluded. These gardens also reduce household spending on vegetables by supplying homegrown produce and offer the potential for additional income through the sale of surplus harvest. The proportion test reported that the calculated Z count was 30.187 with a Z table value of 1.64. The calculation results showed that the Z-value exceeded the Z-table value, leading to the rejection of the null hypothesis. Most members perceived the Seribu Galon program as a collaborative and environmentally friendly activity that strengthened social ties and improved household food access, yet it remained a secondary initiative rather than a main source of income. Approximately 50%

Table 2. Sustainability of Seribu Galon Program

Indicators	Interval Scor	Average Scor	Sustainability Rate (%)	Categories
A. Ecology dimension				
The program preserves the environment	0-5	4.07	81.33	very sus- tainable
The program reduces the risk of soil erosion	0-5	3.93	78.67	Sustainable
The program encourages environmentally friendly use	0-5	4.07	81.33	very sus- tainable
Program to utilize vacant land into produc- tive land	0-5	3.62	72.33	Sustainable
The program increases reforestation	0-5	3.67	73.33	Sustainable
The program increases biodiversity in the surrounding environment	0-5	4.2	84	very sus- tainable
The program increases community awareness	0-5	4.2	84	very sus- tainable
The program can reduce plastic waste in the community	0-5	3.68	73.67	Sustainable
The program supports the implementation of the recycling system (utilization of used gallons)	0-5	3.6	72	Sustainable
Average(A)			77.85	Sustainable
B. Social dimension				
The program encourages community involvement in agricultural activities	0-5	4.05	81	very sustain- able
The groups of women farmers actively participate	0-5	4.15	83	very sus- tainable
The program receives support from the sur- rounding community	0-5	3.97	79.33	Sustainable
The program strengthens social relations between members of WFG	0-5	4.18	83.67	very sus- tainable
The program strengthens WFG members' relationship with the surrounding community	0-5	4.2	84	very sus- tainable
Program support for gotong-royong and cooperation habits in the community	0-5	3.53	70.67	Sustainable
The program is under cultural values (habits)	0-5	3.93	78.67	Sustainable
The program is under the norms	0-5	3.95	79	Sustainable
The program provides new knowledge, skills, and experiences related to the utilization of the yard	0-5	4.2	84	very sustain- able
The program received support from the extension	0-5	4	80	Sustainable
The program received support from the Waste Bank	0-5	3.92	78.33	Sustainable

Lanjutan.....

The program received support from community leaders	0-5	4.23	84.67	Sustainable
Good communication between members and parties working in Seribu Galon Program	0-5	3.93	78.67	Sustainable
The Program provides attention and participation from the local community.	0-5	3.92	78.33	Sustainable
Average (B)			80.24	Sustainable
C. Economic dimension				
The program reduces daily food spending	0-5	4	80	Sustainable
The program can provide production facilities and resources independently	0-5	3.98	79.67	Sustainable
It is easier to get information on the current selling price	0-6	3.85	64.17	Sustainable
The harvest from the program has the opportunity to be sold	0-6	3.83	63.89	Sustainable
The harvest is easy to sell	0-6	3.67	61.11	Sustainable
There is a definite market for the harvest	0-6	3.47	57.78	Hesitant
Additional income from the harvest	0-5	3.73	74.67	Sustainable
Family food needs are met through the sale of program products	0-6	3.72	61.94	Sustainable
The program encourages families to be economically prosperous and independent	0-5	3.83	76.67	Sustainable
Average (C)			69.07	Sustainable
Total (A+B+C)	0-176	132.89		
Total Average (A+B+C)			75.72	Sustainable

Source: Primary Data Analysis (2025)

of women farmers had a high level of sustainability. In this context, the program provided long-term benefits to WFG members by integrating ecological, economic, and social Dimensions.

Factors Affecting the Sustainability of the Seribu Galon Program

The factors significantly affecting the sustainability of the Seribu Galon program were age, motivation, as well as the role of women farmers and extension workers. Education level and the role of

chairman had no significant effect on the dimension since the significance values exceeded the alpha level of 0.05. Variations in role of chairman and educational attainment of members did not influence sustainability. Although women farmers had different education levels, based on interviews, the Seribu Galon program was sustained due to their strong motivation to learn and benefit from the activities. The role of the chairman did not significantly affect sustainability, as members demonstrated high awareness and voluntarily participated in all group activities in

accordance with their responsibilities within the group.

Age of Women Farmers Group Members

The age variable had a significance value (p-value) of 0.045, smaller than the alpha level of 0.05, and a negative regression coefficient of -0.305. This showed a statistically significant inverse relationship between age and the sustainability of the Seribu Galon program. A negative correlation was observed between the age of women farmers and the level of sustainability.

Younger women farmers had greater enthusiasm in implementing the Seribu Galon program due to their energetic physical condition and openness to innovation. In some groups, younger members were designated as group administrators. Older members preferred to manage crops directly on the demonstration

plot because collecting and lifting the gallon containers was physically demanding. They found cultivating directly in the soil easier, as it did not require lifting and moving the gallon containers. Oktafia et al. (2022) showed that farmers over the age of 50 had more difficulty adopting new knowledge and continuing long-standing practices. This tendency was influenced by physical conditions and psychological maturity formed by life experiences, which affected the capacity to absorb new information.

Motivation of Women Farmers Group Members

The motivation of women farmers, driven from the need to fulfill personal goals, had an important role in the sustainability of the Seribu Galon program. The motivation variable had a significance value of 0.001, lower than the standard of 0.05, with a positive

Table 3. Factors Affecting the Sustainability of Seribu Galon Program

Variables	Regression	T score	Sig	Note
Age (x_1)	-0.305	-2.051	0.045	*
Education (x_2)	-0.677	-1.204	0.234	NS
Motivation (x_3)	0.644	5.481	0.001	*
Role of Women Farmers (x_4)	0.236	1.908	0.062	**
Role of Extension Workers (x_5)	0.299	3.618	0.001	*
Role of Chairman (x_6)	0.047	0.475	0.637	NS
Constanta	46.844			
R	0.763			
R square	0.582			
Adjusted Square	0.552			
F score	19.149			
F table	2.39			

Note : *significant in $\alpha=5\%$, **significant in $\alpha=10\%$, NS Non Significant in $\alpha = 5\%$ and 10%

Source: Primary Data Analysis (2025)

regression coefficient of 0.644. Therefore, the sustainability of the program increased by 0.644 with a one-unit rise in motivation. The strong motivation among members was mainly driven by the desire to fulfill related needs.

The preeminent need identified among members was relatedness, characterized by an inclination to forge connections and social relationships with fellow members and the wider community. Field observations indicated that members believed active participation in the program and the cultivation of extensive social connections enhanced their sense of recognition and acceptance within the women farmers' group and the broader community. This in turn reinforced their motivation to engage in program activities. Fulfillment of social relatedness through recognition and appreciation from others significantly enhances individual motivation and engagement within the community context (Vo et al., 2022).

Condongcatur Village was classified as an urban area with limited agricultural land. This condition allowed members to collectively implement the program carried out. Members were motivated to participate in the Seribu Galon program because it facilitated collaboration between the Women Farmers Group and the broader community. Activities such as collecting used gallons promoted mutual cooperation and engagement, enabling members to gain support from the village, extension workers, and local residents, thereby strengthening the program's social sustainability,

particularly in an urban context with dense population and limited agricultural land. Community urban farming programs offer a place for people to work and connect with each other to reduce feelings of loneliness in crowded cities (Tabrez, 2025).

The program was implemented through collaboration in providing agricultural facilities and infrastructure. Used gallons were collected from the community, while seeds and fertilizers were obtained from the village administration and extension workers. Need-based encouragement played an important role in improving sustainability, since the varying levels of sustainability were determined by the influence of motivation (Dzikrillah et al., 2017).

Role of Women Farmers

The role of women farmers had a significance value (sig) of 0.062 which was less than alpha (10%), and a regression coefficient of 0.236. Therefore, the role of WFG had a significant effect on sustainability. An increase of one unit in WFG role variable corresponded to a 0.236 rise in sustainability. Women farmers typically fulfilled crucial functions as learning, cooperative, and productive agents at every phase of program execution. These roles comprised serving as an educational setting for group knowledge acquisition, a collaborative platform for community members to enhance agricultural output, and a manufacturing unit for developing beneficial products (Fatmawati et al., 2022).

As a learning unit, members shared information and engaged in

discussions about plant cultivation, pest and disease management, and the use of gallons as planting media. The meetings are routinely facilitated during scheduled group meetings. Functioning as a cooperative unit, members consistently perform duties according to an established schedule. If a member was unable to attend, the duty was rescheduled. As a production unit, the Seribu Galon program was maximized by cultivating various sites, such as WFG areas, home gardens, and roadside verges. The women farmers group also implemented structured administrative practices, including annual program planning and monthly performance evaluations. The role of WFG as a production unit was essential in developing a business entity capable of achieving economies of scale in terms of quantity, quality, and sustainability (Santi et al., 2024).

Role of Extension Worker

The role of extension workers had a significance value (sig) of 0.001 which was less than the alpha level of 0.05, and a positive regression coefficient of 0.299. Role of extension workers was directly proportional to the sustainability of the Seribu Galon program. According to Wahyudi et al. (2024), the role included functioning as educators, facilitators, motivators, and evaluators. Extension workers conducted monthly visits to WFG to monitor the progress of all ongoing initiatives, including the Seribu Galon program.

As an educator, extension workers often provided training according to the topic needed by the group. Topics included the use of social

media for marketing, post-harvest processing, production of biological agents, and pest and disease management strategies. Furthermore, extension workers always provided discussion sessions for members to share their complaints and aspirations during farming activities as a facilitator. As motivators, extension workers routinely provided encouragement and praise, guiding members toward opportunities concerning capital, marketing strategies, commodities, and WFG products. They also frequently encouraged groups to actively participate in program activities and to engage in inter-regional WFG competitions. In the capacity as evaluators, these professionals dispensed constructive criticism, insights, and proposals designed to augment the enduring sustainability of the program. Extension workers monitored crop conditions and assessed existing challenges before providing constructive feedback and recommendations to the group and WFG members. Extension workers contributed to sustainable agricultural development through comprehensive roles to facilitate learning, provide information, assist farmers, resolve issues, offer guidance, and conduct monitoring and evaluation (Dea et al., 2024).

The Sustainability of the Seribu Galon Program on Household Food Security of Women Farmers

The sustainability of the Seribu Galon program was identified as an important aspect of household food security. This context represented an important method of achieving

long-term food provision for the family members of women farmers. Conversely, a lack of this dimension compromised future food systems in the context of limited agricultural land.

According to Government Regulation of Indonesia (PPI No. 68 of 2002), household food security refers to the condition in which women farmers can access and fulfill their food needs. This condition was assessed based on the four dimensions of food security as defined by the FAO (2006), which included availability in terms of quality and quantity, household access, stability of supply over time, and the utilization of food by members. The program's sustainability on household food security was determined through the results of simple linear regression analysis.

The women farmer members highlighted that the Seribu Galon program should be sustained because of the multiple benefits of its harvests. They reported that the program ensured sufficient vegetable availability for household consumption, with produce obtained regularly from home yards or WFG demonstration plots, thereby reducing the need to visit markets. Access to production inputs was facilitated by village government support, which minimized additional costs and enabled efficient farming practices. Harvests were perceived as nutritionally superior and safe due to organic cultivation and enhancing food utilization. Despite limited land and fluctuating market prices, the program provided a stable supply of produce, demonstrating its contribution to consistent household food security.

Table 4 shows that the sustainability of the Seribu Galon program has a significant effect on the household food security of women farmers. This was reported through the significance value (sig) of 0.001 which was less than alpha (0.005) with a positive regression coefficient of 0.607. Therefore, an increase of one unit in the sustainability dimension corresponded to a 0.607 rise in household food security. The sustainability of the program in relation to household food security among women farmers was a critical factor in ensuring consistent availability. The dimensions contributed to and influenced long-term household food security.

The sustainability of ecological dimension played an important role in supporting food availability and utilization. The program was implemented using environmentally conscious methods, specifically including the repurposing of used gallons acquired from the community, the deployment of organic fertilizers, and the independent manufacture of vegetable-based pesticides. Therefore, the harvests contributed to the consumption of more nutritious food since the crops were grown without chemical inputs. From the perspective of WFG members, the choice to use organic methods was fundamentally driven by the desire to provide safe food and to manage waste effectively. The repurposed gallons are not merely seen as containers but as a necessity due to limited urban space. The program also optimized the use of limited yard space through gallons. This study aligns with the findings from Richardson (2010)

Table 4. Effect of the Sustainability of the Seribu Galon Program on Household Food Security of Women Farmers

Variables	Regression coefficient (B)	T score	Sig	Note
The Sustainability of the Seribu Galon Program	0.607	9.733	0.001	*
Constanta	-3.041			
R	0.788			
R square	0.620			
Adjusted Square	0.614			
F score	94.732			
F table	4.01			
T table	1.67356			

Note : *significant in $\alpha=5\%$, **significant in $\alpha=10\%$, NS Non Significant in $\alpha = 5\%$ and 10%

Source: Primary Data Analysis (2025)

which also showed that food security depended on the sustainable use of natural resources and provision of ecology services in developing countries.

The sustainability of the social dimension played a significant role in enhancing food access, stability, and utilization. Cooperation between group members and the waste bank in providing program facilities was good. This cooperation was widely viewed by members as the most essential element of sustainability, creating strong social capital that mitigates the risk of individual failure. Furthermore, wider networks were actively built to obtain physical support and recognition in the community. This cooperation and mutual assistance facilitated members' access to production resources from stakeholders.

The sustainability of the economic dimension directly influenced access to food. Members reduced their food expenditures by acquiring program harvests at reduced prices. These savings enabled the reallocation

of funds to procure food items and optimize overall access. Beyond mere cost savings, the members' long-term economic goal was to achieve financial independence and generate supplementary group income by securing stable market access. Furthermore, the establishment of a stable market, characterized by consistent pricing, contributed to maintaining household food stability, independent of fluctuating prices.

Berry et al. (2015) stated that sustainability from the ecology dimension, such as the availability of natural resources and biodiversity preservation, maintained food availability. In the context of economic and social aspects, this dimension allowed equal access to food. Furthermore, social sustainability played a role in supporting good food utilization. The three aspects maintained food stability to sustain the food security system. Food security is a product of a complex system dependent on ecological, economic, and social functions (Clapp et al., 2022).

CONCLUSION AND SUGGESTION

In conclusion, this study found that most women farmers reported high sustainability of the Seribu Galon program. This result was significantly impacted by age, motivation, the functions of women farmers, and the contributions of extension workers. In contrast, education and the role of chairman did not show a significant effect. The sustainability of the program had a significant positive impact on the food security of household members. Therefore, a higher level of the dimension corresponded to increased food security among households of women farmers.

As a recommendation to maximize the sustainability of the program, efforts to enhance economic sustainability should focus on increasing production volume and maintaining consistent harvest yields. This can be achieved through improved cultivation management, including careful selection of crop commodities, and effective pest and disease control, with the active implementation by the WFG. The growth of harvest yields with market potential can be strategically addressed by using online platforms, such as a WhatsApp pre-order system, to commence community-level product commercialization. Furthermore, the role of extension workers should be strengthened by providing ongoing training support and regular monitoring to ensure the motivation and active participation of women farmers.

This study is limited in scope to

identifying factors influencing program sustainability and food security. For future research, the scope can be expanded to add other factors that are not yet studied and might influence program sustainability, such as the availability of materials and tools for farming operations. Furthermore, to make the research comprehensive, it is recommended to develop a research model that can measure the direct and indirect influence of variables such as age, motivation, the role of WFG, and the role of extension workers on the household food security of WFG members.

REFERENCES

- Adji, A. R. P., Santosa, L. W., & Harini, R. (2024). Kajian Daya Dukung Lingkungan Berdasarkan Produktivitas Lahan Pertanian dalam Menunjang Swasembada Pangan di Kabupaten Sleman Daerah Istimewa Yogyakarta. *Syntax Literate ; Jurnal Ilmiah Indonesia*, 9 (4), 2904–2921. <https://doi.org/10.36418/syntax-literate.v9i4.15334>
- Azwar, S. (2001). Asumsi-Asumsi Dalam Inferensi Statistika. *Buletin Psikologi*, 9(1), 8–17.
- Badan Pusat Statistik. (2020). *Kepadatan Penduduk Menurut Kecamatan (Jiwa/KM2), 2020-2022*. <https://slemankab.bps.go.id/id/statistics-table/1/ODIjMQ==/luas-wilayah-banyaknya-penduduk-dan-kepadatan-penduduk-per-km2-menurut-kecamatan-di-kabupaten-sleman-2016.html>
- Berry, E. M., Dernini, S., Burlingame, B., Meybeck, A., & Conforti, P. (2015). Food Security and Sustainability: Can One Exist without the Other? *Public Health Nutrition*, 18(13), 2293–2302. <https://doi.org/>

- [10.1017/S136898001500021X](https://doi.org/10.1017/S136898001500021X)
- Clapp, J., Moseley, W. G., Burlingame, B., & Termine, P. (2022). Viewpoint: The Case for a Six-Dimensional Food Security Framework. *Food Policy*, 106, 102164. <https://doi.org/10.1016/j.foodpol.2021.102164>
- Data Kabupaten Sleman. (2022). Diakses dari <https://data.sleman.kab.go.id/data/group/perikanan> [28 Maret 2025]
- Dea, A. Y., Kaleka, M. U., dan Ngaku, M. A. (2024). Peran Penyuluh Pertanian dalam Mendukung Pembangunan Pertanian berkelanjutan. *Jurnal Agribis*, 17(1): 2280-2290. <https://doi.org/10.36085/agribis.v17i1.5950>
- Dzikrillah, G. F., Anwar, S., & Sutjahjo, S. H. (2017). Analisis Keberlanjutan Usahatani Padi Sawah Di Kecamatan Soreang Kabupaten Bandung. *Jurnal Pengelolaan Sumberdaya Alam Dan Lingkungan (Journal of Natural Resources and Environmental Management)*, 7(2), 107-113. <https://doi.org/10.29244/jpsl.7.2.107-113>
- FAO. (2006). Food Security: FAO policy brief. Diakses dari <http://www.fao.org/forestry/131280e6f36f27e0091055bec28ebe830f46b3.pdf>. [10 April 2025].
- Fatmawati et al. (2022). The Role of Women Farmer Groups in Household Income in Kediri. *AGROSOCIONOMICS: Jurnal Sosial Ekonomi Dan Kebijakan Pertanian*, 6(2), 339-347. <https://doi.org/10.14710/agrisocionomics.v6i2.13375>
- Hofmann, T., Ghoshal, S., Tufenkji, N., Adamowski, J. F., Bayen, S., Chen, Q., Demokritou, P., Flury, M., Hüffer, T., Ivleva, N. P., Ji, R., Leask, R. L., Maric, M., Mitrano, D. M., Sander, M., Pahl, S., Rillig, M. C., Walker, T. R., White, J. C., & Wilkinson, K. J. (2023). Plastics Can be Used more Sustainably in Agriculture. *Communications Earth and Environment*, 4(1), 1-11. <https://doi.org/10.1038/s43247-023-00982-4>
- Kecamatan Depok dalam Angka. (2022). Diakses dari <https://slemankab.bps.go.id/id/publication/2025/09/26/c86e423b812a5ce6af6107cf/kecamatan-sleman-dalam-angka-2025.html> [4 April 2025]
- Kurnianingsih, N. A., & Rudiarto, I. (2014). Analisis Transformasi Wilayah Peri-Urban pada Aspek Fisik. *EJournal Undip*, 10(3), 265-277.
- Langellotto, G. A. (2014). What are the Economic Costs and Benefits of Home Vegetable Gardens? *Journal of Extension*, 52(2), 0-7. <https://doi.org/10.34068/joe.52.02.14>
- Mahpudin, M., Dewi, S. K., Yaman, K., Sari, N., & Efrizal, R. (2024). Urban Farming: Mendorong Ketahanan Pangan Keluarga Melalui Pelatihan Budidaya Ikan Dan Sayuran Menggunakan Media Ember. *JMM (Jurnal Masyarakat Mandiri)*, 8(2), 1742. <https://doi.org/10.31764/jmm.v8i2.21671>
- Masti, S. E., Syahni, R., & Rusda Khairati. (2024). Kinerja Fasilitator Dalam Keberlanjutan Kawasan Rumah Pangan Lestari. *Jurnal Niara*, 17(1), 69-78. <https://doi.org/10.31849/niarav17i1.19911>
- Oktafia, R., Damiri, A., Harta, L., & Robiyanto. (2022). Respon Petani Terhadap Budidaya Padi Sawah Farmers Response On Rice Cultivation Abstrak. *Jurnal KaliAgri*, 3(1). <https://doi.org/10.56869/kaliagri.v3i1.329>
- Purnaningsih, N., & Lestari, E. (2021). Sustainability of the Kawasan Rumah Pangan Lestari Program for a Farmer Women Group in Beji Village, Wonogiri Regency, Central Java Province. *Jurnal Agro*

- Ekonomi*, 39(1), 69–80.
- Richardson, R. B. (2010). Ecosystem Services and Food Security: Economic Perspectives on Environmental Sustainability. *Sustainability*, 2(11), 3520–3548. <https://doi.org/10.3390/su2113520>
- Ridwan & Ismail, M. (2025). Population Growth Has an Impact on The Economy and Food Availability. *Journal of Posthumanism*, 5(6), 2819–2827. <https://doi.org/10.63332/joph.v5i6.2400>
- Ruhimat, I. (2015). Status Keberlanjutan Usahatani Agroforestry pada Lahan Masyarakat: Studi Kasus di Kecamatan Rancah, Kabupaten Ciamis, Provinsi Jawa Barat. *Jurnal Penelitian Sosial Dan Ekonomi Kehutanan*, 12(2), 99–110.
- Sahraei, S., Pakravan-Charvadeh, M. R., Gholamrezai, S., & Rahimian, M. (2022). Assessing the association of sustainable agriculture with rural household food security (considering ecological, economic, and social aspects). *Frontiers in Nutrition*, 9(1). <https://doi.org/10.3389/fnut.2022.899427>
- Santi, W. O., Hamzah, A., & Jayadisastira, Y. (2024). Pemberdayaan Petani Melalui Peran Kelompok Tani Padi Sawah Di Kelurahan Baruga Kecamatan Baruga. *Jurnal Ilmiah Penyuluhan Dan Pengembangan Masyarakat*, 4(3), 228–237. <https://doi.org/10.56189/jippm.v4i3.30>
- Saptana, N., Indraningsih, K. S., Ashari, N., & Mardiharini, M. (2021). Prospek Keberlanjutan Program Kawasan Rumah Pangan Lestari. *Analisis Kebijakan Pertanian*, 19(1), 69–87. <https://doi.org/10.21082/akp.v19n1.2021.69-87>
- Subramaniam, Y. (2023). Population Growth, Biofuel Production, and Food Security. *Green and Low-Carbon Economy*, 2(4), 259–268. <https://doi.org/10.47852/bonviewGLCE3202948>
- Sudalmi, E. S. (2010). Pengembangan Pertanian Berkelanjutan. *INNOFARM: Jurnal Inovasi Pertanian*, 09(2), 15–28. <https://doi.org/10.33061/innofarm.v9i2.28>
- Syahrizal, H., & Jailani, M. S. (2023). Jenis-Jenis Penelitian Dalam Penelitian Kuantitatif dan Kualitatif. *Jurnal QOSIM Jurnal Pendidikan Sosial & Humaniora*, 1(1), 13–23. <https://doi.org/10.61104/jq.v1i1.49>
- Tabrez, Z. (2025). Sustainable cities: enhancing food systems with urban agriculture. *Discover Food*, 5(1). <https://doi.org/10.1007/s44187-025-00439-x>
- Vo, T. T. D., Velásquez, K., & Chung-Wen, C. (2022). Work Motivation: The Roles of Individual Needs and Social Conditions. *Behavioral Sciences*, 12(Behav. Sci. 2022, 12, 49.), 49. <https://doi.org/10.3390/bs12020049>
- Wahyudi, A. F., Sumekar, W., & Prasetyo, A. S. (2024). Peran Penyuluh Terhadap Partisipasi Petani Pada Program Pendampingan Kelompok Di Kecamatan Blora. *Jurnal Ekonomi Pertanian Dan Agribisnis*, 8(1), 64. <https://doi.org/10.21776/ub.jepa.2024.008.01.6>
- Wardani, R. D., & Yuliawati, Y. (2023). Pengaruh Kondisi Sosial Ekonomi Terhadap Tingkat Ketahanan Pangan Rumah Tangga Di Kota Salatiga Pada Masa Pandemi Covid-19. *Jurnal Ilmiah Mahasiswa AGROINFO GALUH*, 10(1), 360. <http://dx.doi.org/10.25157/jimag.v10i1.8992>