IMPLEMENTATION OF SUSTAINABLE FOOD HOUSE AREA MODEL (SFHAM) IN CICADAS' VILLAGE, CIBEUNYING KIDUL SUB-DISTRICT, BANDUNG

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Abstract— ***This community service activity aims to implement the Sustainable Food House Area Model (SFHAM) as an effort to improve food security and community welfare in Cicadas Village, Cibeunying Kidul District, Bandung. The activity stages include site surveys and coordination with relevant parties, socialization of the SFHAM concept, and training in innovative farming techniques such as hydroponics, the Dutch Bucket System (DBS), and the Organic Tower Garden (OTG). The results of the activity demonstrate success in enhancing residents' knowledge and skills in managing their yards as sustainable food sources, as well as their ability to independently produce healthy food. SFHAM has proven to be an effective approach for local food security in urban areas when supported by continuous mentoring and active community participation. Evaluation and monitoring indicate the need for continuous mentoring and adaptation of methods to local conditions to ensure the sustainability of the program. Thus, the implementation of SFHAM is expected to support local food security, improve family economics, and contribute to sustainable environmental management in urban areas.***

Keywords— food security, SFHAM, urban farming, backyard, community empowerment.

I. INTRODUCTION

Food security issues and the community's dependence on imported foodstuffs pose serious challenges in Indonesia, including in urban areas such as the city of Bandung. Cicadas Village, Cibeunying Kidul District, as one of the densely populated areas, faces problems of limited agricultural land, high food prices, and low community awareness of the use of yards for family food security. According to data from the Central Bureau of Statistic of Bandung City (2023) [1], the city's dependence on food supplies from outside the region reaches 70%, necessitating community empowerment efforts to enhance food self-reliance.

One innovative solution that can be implemented is the Sustainable Food House Area Model (SFHAM), a program initiated by the Ministry of Agriculture of the Republic of Indonesia to encourage optimal utilization of backyard land through the cultivation of food crops, fruits, vegetables, and small-scale livestock [2]. The SFHAM concept aims not only to meet household food needs but also to improve community nutrition, reduce expenses, and support environmental sustainability through sustainable urban agriculture. Various studies have shown that the SFHAM program can improve the Food Consumption Pattern (FCP), reduce expenses for food needs, and encourage active community participation in local food production and consumption activities [3]. Studies conducted in several regions such as Lampung, Kediri, and Padang show that SFHAM not only increases food consumption diversification but also has a tangible economic impact through the sale of harvests and the processing of household agricultural products [4, 5, 6].

In Cicadas Village, the potential for implementing SFHAM is quite significant, given the presence of unused backyard land that has not been fully utilized. An initial survey conducted by the community service team revealed that 65% of households in this area have backyards ranging in size from 10–50 m², but only 20% of them use their backyards for growing vegetables or fruits (Primary Data, 2024). Additionally, the low level of public knowledge about urban farming techniques and harvest management systems poses a major challenge. This situation makes Cicadas a strategic location for the implementation of community service activities based on the SFHAM model.

Based on this background, the aim of this community service activity is to implement and develop a sustainable food house area model systematically, sustainably and oriented towards community empowerment in Cicadas village. It is expected that this activity can serve as a model for strengthening local food security in urban areas, reducing dependence on markets, and creating productive and sustainable green zones through collaboration between academics, government, and the community. This program aligns with Sustainable Development Goals (SDGs) 2 (Zero Hunger) and 12 (Responsible Consumption and Production) [7], while also supporting the Bandung City Government's program to realize Bandung as an Agropolitan City [8].

II. MATERIAL AND METHODS

The Community Service Activity (CSA) was conducted in RW 10, Cicadas Village, Cibeunying Kidul District, Bandung, from April to November 2022. This CSA activity utilized the Participatory Rural Appraisal, Participatory Technology Development, and Community Development approaches, employing non-technical and technical extension methods, as well as demonstrations and on-site guidance at a demonstration plot [9]. The implementation of the CSA was divided into several stages:

Preparation

Preparation activities included: (1) collecting initial information about potential resources and target groups, (2) meetings with relevant agencies to reach agreements on selecting target groups and locations, (3) coordination with the Bandung City Agriculture and Food Security Agency, (4) selecting mentors proficient in community empowerment techniques according to predetermined criteria.

Group Formation

Target groups are households or groups of households within a Neighborhood Association or Community Association. The approach used is participatory, involving target groups, community leaders, and village officials. Groups are formed by, for, and in the interests of the group members themselves. By forming groups, the members will develop their own strength based on the principles of harmony, togetherness, and leadership.

Socialization

Conveying the purpose and objectives of CSA activities and making initial agreements on follow-up plans. Socialization activities are carried out with target groups, community leaders, and relevant agency officials.

Strengthening Group Institutions

Strengthening is carried out to enhance the group's capabilities: (1) to make decisions collectively through deliberation; (2) to comply with decisions made collectively; (3) to obtain and utilize information; (4) to collaborate within the group (cooperation); and (5) to collaborate with officials and other community groups.

Activity Planning

Planning/designing the utilization of backyard land by planting various food crops, vegetables, and medicinal plants, as well as preserving food crops for the future. These activities are carried out together with the group and relevant government agencies.

Training

Training is conducted prior to field implementation. The types of training include horticultural cultivation techniques, such as hydroponic technology systems, the Dutch Bucket System (DBS), and the Organic Tower Garden (OTG).

Implementation

The activities are implemented by the groups with technological supervision by the CSA team and guidance. Gradually, the implementation aims to achieve household food self-sufficiency, conservation of food crops for the future, and improved well-being.

Monitoring and Evaluation

Conducted to determine the progress of activities and assess the suitability of activities that have been carried out with the plan. Evaluators can be formed by groups. Evaluators can also serve as motivators for administrators and group members in improving their understanding of the management of available resources in their environment so that they are sustainable.

III. RESULT AND DISCUSSION

A. Site Survey and Coordination

The activity began with a site survey in RW 10, Cicadas Village, Cibeunying Kidul Subdistrict, Bandung City. The survey aimed to identify the potential of backyard land and community needs related to food security. Coordination was conducted with village officials, the RW 10 Chairman, RT Chairmen, and local members of Family Welfare and Empowerment to ensure support and active participation in the implementation of SFHAM.

The survey results show that:

- 65% of households have yards measuring 10–50 m², but only 20% are used for growing vegetables or fruit.
- Most of the community does not yet understand the concept of urban farming and modern cultivation techniques such as hydroponics.
- There is high interest among residents to participate in training, especially among Family Welfare and Empowerment mothers and local farmer groups.
- Coordination with the sub-district office is running smoothly, with full support for the provision of demonstration plots and facilitation of socialization.

Figure 1. Site survey and coordination

B. Socialization of the Sustainable Food House Area Model (SFHAM)

The socialization activity was held in the village hall and attended by 30 participants consisting of representatives from each neighborhood unit, village

officials, and representatives of members of Family Welfare movement. The materials presented included:

- The concept of the Sustainable Food Security Area Model (SFHAM) and its benefits.
- The potential for utilizing yards for family food security.
- Examples of successful SFHAM initiatives in other regions (e.g., in Bogor and Surabaya).

Participants showed high enthusiasm, as evidenced by the numerous questions and discussions during the session. The socialization successfully instilled an initial understanding among the community about the importance of household-based food self-reliance in urban areas. Participant responses were very positive, with 85% expressing interest in participating in further training.

Figure 2. Socialization of the Sustainable Food House Area Model (SFHAM)

C. Training on the Sustainable Food House Area Model (SFHAM)

The training is provided to introduce and develop innovative and efficient cultivation techniques in residents' backyards. Participants receive practical knowledge and direct guidance in applying horticultural cultivation technology in their yards. The training consists of:

a. Hydroponics Training

Hydroponics is a cultivation technique that does not use soil, instead using nutrient solutions [10]. This training aims to provide an alternative cultivation method that is space- and water-efficient. Participants are trained in basic hydroponic techniques, from setting up simple installations, selecting growing media, to plant care. Participants are taught how to sow seeds, prepare nutrient solutions, and assemble a household-scale NFT hydroponic system. Participants engage in hands-on planting of leafy vegetables such as water spinach, spinach, and lettuce using the hydroponic system, and receive training modules and practical materials to apply independently at home. This activity has received positive feedback as it is suitable for small plots of land and relatively easy to maintain.

Figure 3. Hydroponics

b. Dutch Bucket System (DBS) Training

The Dutch Bucket System (DBS) is a hydroponic system that uses buckets as planting media containers and is continuously supplied with nutrients [11]. DBS was introduced as a solution for growing fruit crops (tomatoes, chili peppers, eggplants) in limited land areas. The training covers the installation of DBS, water and nutrient circulation settings, and plant maintenance. DBS training is focused on fruit and large vegetable crops such as tomatoes and chili peppers. The system is applied at a demonstration site using recycled paint buckets, charcoal husk media, and water pumps. Participants learn to build a simple DBS installation using recycled buckets and a drip irrigation system. DBS offers an efficient alternative for gardens with adequate lighting.

Figure 4. Dutch Bucket System (DBS)

c. Organic Tower Garden (OTG) Training

The Organic Tower Garden (OTG) is a space-efficient vertical farming system that prioritizes the use of organic materials and the management of organic waste as fertilizer [12]. OTG is a vertical farming technique using organic media (compost and cocopeat) that is suitable for vegetable crops such as spinach, pak choi, and water spinach. This training covers the assembly of planting towers from PVC pipes and used drums, filling with organic planting media, and nutrient-dense planting techniques. Participants are very interested because OTG allows for the cultivation of

up to 30–40 planting holes in one small unit, making it very efficient in limited areas.

Figure 5. Organic Tower Garden (OTG)

D. Success of Activities

The implementation of SFHAM at the pilot site showed promising initial success. Several indicators of success achieved include:

- Increased community knowledge and skills in managing yards as a source of sustainable food.
- The formation of 3 SFHAM groups, each consisting of 10–15 members.
- A 50 m² demonstration plot was successfully established with various crops (vegetables, fruits, and herbs).
- 70% of participants have applied the techniques taught in their own homes.
- Increased interest among other residents to replicate the OTG and hydroponic systems in their own homes.
- Availability of vegetable harvests such as pakcoy, kangkung, and tomatoes within less than two months.

Socially, this activity also fostered a spirit of cooperation and strengthened positive interactions among residents, particularly in joint garden maintenance activities.

E. Evaluation and Monitoring

Monitoring is conducted periodically to monitor crop development and the sustainability of SFHAM implementation. Periodic monitoring is carried out through field visits, interviews, and questionnaires to assess the sustainability and impact of activities. This monitoring is also used to respond to technical challenges that arise and provide practical solutions to residents. Evaluation covers technical aspects of cultivation, community participation, and the impact on food security and family economics.

Evaluation results show:

- 90% of participants found the training easy to understand and applicable at home.
- 75% of participants stated they had begun planting on their own using the system learned.
- The main challenges encountered were limited initial capital for purchasing hydroponic equipment, availability of materials such as pumps and hydroponic nutrients, and lack of knowledge about marketing harvested products.
- Recommendations for sustainability:
- Establishment of a neighborhood seed bank to ensure seed availability.
- Advanced training on harvest processing and marketing.
- Collaboration with the Bandung City Agriculture Department for intensive mentoring.

IV. CONCLUSION

Community service activities through the implementation of SFHAM in Cicadas Village successfully increased the utilization of backyard land, knowledge of modern cultivation techniques, and household food security. Hydroponic training, the Dutch Bucket System (DBS), and the Organic Tower Garden (OTG) were well-applied by residents, though further guidance is still needed for sustainability and program development in the future. Thus, the SFHAM program in Cicadas Village can serve as a model for sustainable food production development in other urban areas, provided there is continuous support, collaboration between academics, government, and the community, and access to infrastructure supporting urban agriculture. Overall, this program has a positive impact on food security, community well-being, and environmental management in urban areas.

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