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Urban Farming in Polybag: Socialization for Urban Areas

Sosialisasi Urban Farming di Daerah Perkotaan

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Abstrak

Pertumbuhan wilayah perkotaan di Indonesia memicu penyusutan lahan produktif secara signifikan, yang berdampak pada kerentanan ketahanan pangan rumah tangga dan beban ekonomi akibat fluktuasi harga komoditas hortikultura. Fenomena ini terlihat jelas di Kelurahan Asemrowo, Kota Surabaya, di mana kepadatan pemukiman yang tinggi membatasi pemanfaatan pekarangan sebagai ruang produktif. Kegiatan pengabdian masyarakat ini bertujuan untuk meningkatkan pengetahuan dan keterampilan teknis warga dalam menerapkan urban farming berbasis polybag. Metode pelaksanaan mencakup tiga tahapan utama: pendidikan masyarakat melalui ceramah interaktif, pelatihan melalui praktik langsung budidaya cabai rawit (*Capsicum frutescens L.*) dan terung (*Solanum melongena*), serta pendampingan partisipatif. Efektivitas program diukur melalui instrumen pre-test dan post-test terhadap peserta. Hasil evaluasi menunjukkan peningkatan kompetensi peserta secara signifikan; rerata skor pemahaman konsep meningkat dari 30 menjadi 80, sementara rerata skor teknik dan penerapan meningkat dari 25 menjadi 80. Penggunaan media polybag terbukti memiliki tingkat penerimaan yang tinggi karena fleksibilitas dan efisiensi biaya bagi lahan sempit. Disimpulkan bahwa integrasi antara sosialisasi teori dan metode pendampingan praktis berhasil mengubah persepsi warga serta memberikan kemampuan dalam implementasi pertanian perkotaan sebagai strategi penguatan ketahanan pangan komunitas yang berkelanjutan.

Kata Kunci: ketahanan pangan, *polybag*, pemberdayaan masyarakat, *urban farming*.

Abstract

Urban expansion in Indonesia has led to a significant reduction in productive land, which has impacted household food security and created an economic burden due to fluctuations in horticultural commodity prices. This phenomenon is clearly evident in Asemrowo Village, Surabaya, where high residential density limits the use of backyards as productive spaces. This community service activity aims to enhance residents' knowledge and technical skills in implementing polybag-based urban farming. The implementation method comprises three main stages: community education through interactive lectures, training through hands-on cultivation of chili peppers (Capsicum frutescens L.) and eggplants (Solanum melongena), and participatory mentoring. Program effectiveness was measured using pre-test and post-test instruments administered to participants. Evaluation results indicated a significant improvement in participants' competencies; the average conceptual understanding score increased from 30 to 80, while the average technical and application score rose from 25 to 80. The use of polybags proved to have a high level of acceptance due to their flexibility and cost-efficiency for limited land. It was concluded that the integration of theoretical outreach and practical mentoring methods successfully changed residents' perceptions and provided them with the ability to implement urban agriculture as a strategy for strengthening sustainable community food security.

Keywords: food security, Polybag, community empowerment, urban farming

1. Introduction

Urbanization has significantly contributed to the decline of agricultural land in urban areas, creating growing pressure on household food security. Indonesia, as an agrarian country, faces increasing conversion

of agricultural land into residential and commercial zones, particularly in urban centers such as Surabaya [1]. In response to this challenge, the concept of urban farming has emerged as a strategic approach to support green spatial planning by optimizing the use of limited land for agricultural activities. Urban farming refers to the cultivation of crops within urban environments, enabling local communities to independently produce and directly utilize agricultural outputs [2]. Beyond fulfilling household food needs, urban farming contributes to environmental improvement, enhances urban aesthetics, and creates new economic opportunities. Food security at the household level depends on the ability of each family member to consistently access adequate nutrition to sustain healthy and productive lives [3]. Within the agricultural sector, horticulture represents a particularly promising subsector due to its relatively high market demand and comparatively low production costs [4]. Horticultural crops are generally easy to cultivate and require relatively low production costs. One practical form of urban farming involves planting chili and eggplant using polybag growing media, which is suitable for small-scale cultivation in densely populated areas [5]. The use of polybag media allows urban households to conduct productive agriculture in limited spaces such as home yards, balconies, and communal areas, thereby strengthening local food resilience without requiring large land areas [1].

Chili peppers (*Capsicum sp*.) and eggplants (*Solanum melongena L*.) are horticultural products commonly consumed by Indonesians and provide economic benefits. Chili peppers and eggplants were selected for the urban farming concept because they are suitable for limited land, heat-tolerant when grown in polybags, easy to maintain, have high economic value, and have a relatively fast cultivation cycle. Chili peppers are in high demand due to their distinctive spicy flavour and are widely used in the food, beverage, and pharmaceutical industries. They can also grow in various types of soil found on agricultural land, from lowlands to medium elevations, within a temperature range of 26–28°C and rainfall of 1,000–3,000 mm/year [6]. Cayenne pepper contains various nutrients and benefits for humans, including vitamins A, B, C, and E, as well as minerals such as calcium, iron, and phosphorus [7]. Cayenne pepper plants can be ornamental plants that can beautify gardens and home gardens. Cayenne pepper is also effective for increasing appetite, relieving nasal congestion in sinusitis, and treating migraines [8]. In the food processing industry, chili peppers are used as a natural preservative. As a basic ingredient in food processing, cayenne peppers also contain antioxidants such as capsaicin, phenols, and flavonoids that are beneficial to the body [9]. Research has shown that chili extract exhibits antibacterial activity against gram-positive bacteria such as *Staphylococcus aureus*, supporting its potential as a natural antimicrobial agent [8][10].

Eggplants (Solanum melongena L.) can be grown on a small scale and are quite adaptable to limited land conditions, thriving optimally in loamy soil with a pH of 6.5–7.0 at temperatures between 22–30°C [11]. Eggplant is one of the most popular vegetables among people from all walks of life, both in urban and rural areas, due to its nutritional content including proteins, carbohydrates, vitamins B1, B2, C, and minerals such as iron, phosphorus, and calcium [12]. Demand for eggplant, especially Japanese eggplant and Medan eggplant, continues to increase over time. This increase can be seen from the expanding marketing reach. Currently, eggplant is not only sold in traditional markets, but also widely available in various supermarkets [13]. Moreover, eggplant contains bioactive compounds such as polyphenols, saponins, and tannins that contribute to its potential as a functional food ingredient with health-promoting properties [14].

Asemrowo Subdistrict, Surabaya, is an area with a high population density, meaning its residents face two challenges: a lack of green open spaces and economic vulnerability due to fluctuations in food prices. Based on field observations and initial interviews with village officials and community representatives, the use of home gardens as a source of family food remains relatively low. Most residents lack adequate knowledge and skills regarding food crop cultivation techniques suitable for limited urban land. Additionally, the community in Asemrowo faces economic challenges due to fluctuations in the prices of staple foods, which frequently experience price spikes and directly impact household expenditures. Full reliance on market supplies makes urban households increasingly vulnerable economically and in terms of food security. The limited knowledge of farming systems on small plots of land, as well as the perception that farming requires large tracts of land, are the main obstacles to utilizing backyard plots as productive spaces.

Community service activities related to urban farming are useful in empowering urban communities to utilize their yards by planting various types of high-value crops. Community service activities were carried out by providing assistance to members of the PKK and Karang Taruna in RT 02 RW 01, Asemrowo Village, on cultivating chili and eggplant plants using polybag planting media. This assistance aimed to educate the community on cultivation techniques and the economic potential of chili and eggplant plants in small areas using polybag planting media. The focus of this community service activity includes outreach, training, and mentoring on the benefits of urban farming as a means of sustainable household food production through an educational-practical approach. The objective of this community service initiative is to enhance the knowledge, skills, and awareness of the residents of Asemrowo Village in implementing polybag-based urban farming as a way to productively utilize their backyard spaces. This initiative holds strategic importance in supporting the strengthening of urban household food security through the utilization of limited land.

2. Materials and Method

The implementation of this community service activity was designed using three main approaches: community education, training, and mentoring. The community education approach was implemented in the early stages of the activity through direct instruction to participants. The material presented includes the basic concepts of urban farming, the importance of household food security in urban areas, and an introduction to horticultural crops suitable for cultivation in small plots, particularly chili peppers and eggplants. The material is delivered through interactive lectures accompanied by discussions and Q&A sessions, enabling participants to grasp the basic concepts while relating them to the environmental conditions of their living areas [15].

The training approach was implemented through demonstrations and hands-on practice in growing chili peppers and eggplants using poly bags. At this stage, participants were guided in sowing seeds, preparing the growing medium, planting techniques, and plant care, such as watering and fertilizing. The cultivation techniques applied are adapted to the characteristics of urban environments with limited land availability and are based on horticultural practices that are simple, easy to implement, and environmentally friendly [16].

Assistance was provided throughout the activity through interactive discussions between the implementation team and the participants. This support gave participants the opportunity to share their challenges, questions, and experiences related to crop cultivation. Discussions were held openly to help participants find solutions tailored to the specific conditions of their respective households. This mentoring aimed to strengthen participants' understanding and encourage the continued practice of urban farming after the community service activity concluded. To measure the effectiveness of the training, an evaluation based on pre- and post-tests was conducted. A preliminary assessment was conducted to evaluate participants' understanding and practical application of urban agriculture concepts, consisting of 10 questions on the pre-test and post-test, with each correct answer scored as 10 and each incorrect answer as 0. Participants' understanding levels were classified into three categories: good (score >70), adequate (score 60–70), and insufficient (score <60) [17].

3. Results and Discussion

The community service activity was attended by 10 participants, consisting of members of the PKK (Family Welfare Program), Karang Taruna youth organization representatives, and the head of RT 02 RW 01, Asemrowo Village. The selection of this target group was based on its strategic role in household management, decision-making regarding family food consumption, and active involvement in various community activities within the neighbourhood. The activity began with distributing flyers. The flyers contained information about the concept of urban farming, the benefits of urban farming, and step-by-step illustrations of how to plant chilies and eggplants. Community engagement through informational materials such as flyers has been recognized as an effective approach in knowledge dissemination during community service programs [2].

Figure 1. Flyer about Urban Farming Techniques for Chili Peppers and Eggplants in Polybags

The next activity involved a presentation on the concept of urban farming and the potential for utilizing backyard spaces that have not yet been optimally utilized. The presentation was conducted using a participatory approach through two-way discussions and a question-and-answer session. This approach provided an opportunity for participants to share their experiences, challenges, and initial perceptions regarding gardening activities in urban environments. The participants' enthusiasm was evident in their active participation in the discussions, particularly when addressing issues such as limited land availability, lack of gardening experience, and concerns about the success of plant cultivation amidst the conditions of a densely populated residential area.

Figure 2. The presentation of urban farming information to the residents of Asemrowo Village

The activity continued with a demonstration and hands-on practice of sowing chili and eggplant seeds by the university students. This practical phase is designed as a continuation of the socialization activities, with the aim of providing participants with hands-on experience so they can independently understand and apply horticultural cultivation techniques in small spaces. The practical phase prepares participants to implement sustainable urban farming as a means of utilizing backyard spaces and strengthening household food security [18]. Hands-on learning approaches in community service have been shown to significantly improve participant comprehension and skill retention compared to lecture-only methods [5].

Figure 3. Audience Conducting Field Practice

During the hands-on session, participants were directly involved in filling the growing medium, planting chili and eggplant seedlings, and positioning the polybags to ensure adequate sunlight exposure. This active involvement provided a concrete learning experience and boosted participants' confidence in independently cultivating plants. The two-way interaction between facilitators and participants also allowed for immediate discussion of questions and challenges that arose, making the learning process more participatory [19]. Some community members admitted that they still had difficulty in determining the right planting media, the appropriate watering methods, and how to care for seedlings so that they grow strong and healthy. Others shared their experiences and complaints that their plants were not bearing fruit. The team of lecturers and students explained various simple tips, such as choosing loose planting media, adjusting light intensity, using chicken liver and fermented chicken manure as natural fertilizer by spraying it on plants that were not bearing fruit, and the importance of maintaining moisture in the planting trays. The application of organic fertilizers such as fermented chicken manure has been reported to positively influence plant growth and fruit production in chili and eggplant cultivation [9][20].

Table 1. Comparison of Pre-Test and Post-Test Results on Urban Farming

Evaluation Aspects	Pre Test (Average)	Post Test (Average)
Understanding the concept of urban farming	30	80
Urban Farming Techniques and Applications	25	80

Based on the results of the evaluation conducted using pre-test and post-test instruments, there was a significant improvement in participants' competencies after participating in a series of community service activities on urban farming. Before the activities began, the average score for conceptual understanding was 30, while for the technical application of urban farming, it was only 25. Prior to the activities, most participants did not understand the concept of urban farming and still believed that farming required a large area of land and substantial capital.

After receiving an intervention consisting of theoretical instruction and hands-on practice, the participants' skills saw a dramatic surge. The average score for the pre-test and post-test is 80. This result ranks into the "good" category. This indicates that the practical mentoring and demonstration methods were effective in helping residents understand how to apply urban farming, reflecting the effectiveness of the combined lecture, demonstration, and hands-on approach employed during the program [5]. This activity also resulted in a positive change in the community's attitude towards the use of limited land in urban areas. This aligns with findings from similar community empowerment programs, which report that practical engagement significantly shifts participants' perceptions about the feasibility of urban agriculture in constrained environments [1][2]. Community service activities also fostered public awareness of the economic potential of chili and eggplant cultivation. Explanations were provided on the economic value of chili and eggplant and the opportunities for processing them into value-added products. The cultivation of chili and eggplant using polybags represents a cost-effective strategy that can reduce household food expenditure while simultaneously generating supplemental income when produce is sold or processed [13][14][21]. These outcomes underscore the importance of sustained urban farming education programs as part of broader strategies for achieving urban household food security in Indonesia [3].

4. Conclusion

A community service program on urban farming conducted in Asemrowo Village, Surabaya, has successfully enhanced the community's capacity to utilize limited land productively. Through a participatory approach that combined theoretical instruction with hands-on practice in growing chili peppers and eggplants using poly bags, participants acquired the technical skills to independently implement urban farming. The program's effectiveness can be evaluated through a significant improvement in participants' competencies across two main aspects: the cognitive aspect (conceptual understanding), which saw an average score increase from 30 to 71. These results demonstrate the success in changing participants' perception that agriculture requires vast land and substantial capital. Second is the psychomotor aspect (techniques and application), which saw an average score increase from 25 to 73. This confirms that the use of poly bags as an appropriate technology solution has a high level of acceptability due to their flexible, economical, and practical nature for dense residential environments.

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