Buruan Sae in the city of Bandung: Realizing ideas from urban society

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Abstract. Buruan Sae is part of an integrated urban farming program implemented in the city of Bandung. The program relates to various urban farming products, which are mainly to meet their own food needs, and some are sold to the local markets. One of the targeted products is lime, but its cultivation is not yet well described. This study aimed to determine activities in cultivating lime in Buruan Sae. The study used a qualitative method, and the data were collected from 61 locations in Bandung city through observation, interviews, and literature review. In general, the results of this study showed that Buruan Sae includes the cultivation of vegetables, livestock or fish, fruit trees, family medicinal plants, processed urban farming products, seedling processes, and composting processes. An example for fruit trees is lime cultivation described in this paper, including land preparation, seed preparation, planting, maintenance, harvesting, and post-harvest. One site, namely Buruan Sae Jasmine, was found to be good learning for showing improvement in cultivation.

1. Introduction

Urban agriculture is one form of green open space which is important for improving the city's lifestyle. However, agriculture in the city is displaced by urban activities (e.g., services, industry, and trade) due to rapid development. Agriculture practice is one of the important activities to support food production. Yunus [1] states that unused land in the city can be used or developed as newly cultivated land without interfering with the city's development. Urban agriculture is an effort to optimize land [2].

Urban farming or urban agriculture is the production of the field for food and non-food in urban and suburban areas. It can be organic farming, vertical farming, roof gardening, fisheries, farms, urban forest, family medical plants, and so on [3]. According to Setiawan and Dwiata Hadi Rahmi, who conducted studies in Bandung, Surabaya, Yogyakarta, Cirebon, Salatiga, and Pacitan, urban agriculture could provide benefits to fulfill the food demand, increasing income level, and job opportunities by utilizing available land in the city [4]. One of them is Buruan Sae in Bandung that becomes part of an integrated urban farming program in the city of Bandung, promoted by the Office of Food Security and Agriculture of the city of Bandung, to combine agricultural components, such as
plants, livestock, fish in a unified whole [5]. Buruan Sae is also a program to utilize the existing yard or land by gardening to meet the family’s food needs and the rest to be sold to the local community.

The Buruan Sae includes activities such as processing the urban farming produce, fish, livestock, composting, seeding, family medical plants, vegetables, and fruit trees. Especially in Bandung, lime cultivation is not a new thing for Indonesian people in general. Our country’s climate, which receives direct sunlight, is an ideal condition for the growth of Citrus aurantifolia [6]. Cultivation of lime (Citrus aurantifolia) is promoted because lime is useful as a traditional medicine from several literature reviews can be used as antibacterial, antidiabetic, antihypertensive, anti-inflammatory, antilipidemic activity, antioxidant, anti-parasitic, and antiplatelet. Other functions that can be used for the treatment of cardiovascular disease, liver, osteoporosis, and urolithiasis also act as a fertility promoter.

In addition, in urban farming activities, lime can be used for natural insecticide [7]. The present study was conducted to determine the best practices ranging from capacity building to cultivating lime under the Buruan Sae program.

2. Methods

This study was conducted in November 2020 in Bandung City, the capital of West Java province, which has an area of approximately 16,731 hectares and includes 30 districts [8], especially in Buruan Sae. This study uses qualitative methods of descriptive approach type [9]. The descriptive qualitative approach is suitable for use in qualitative research as a lens or theoretical perspective to guide research [10].

Data collection was carried out through observation, interview, and literature study. Interviews were conducted by in-depth interviews through key informants who were determined by purposive sampling showing active members of Buruan Sae based on experience and understanding in lime cultivation. The sample size is 61 locations of Buruan Sae with an area ranging from 100 - 500 m² which developed from unused land/ public facilities, as presented in the table below (table 1).

**Table 1. Research location**

| No. | Group Name Buruan Sae | Village       | District          |
|-----|-----------------------|---------------|-------------------|
| 1.  | Gending Mas           | Pasir Jati    | Ujungberung       |
| 2.  | Al Biru               | Mekarjaya     | Rancasari         |
| 3.  | Saluyu Indah          | Derwati       | Rancasari         |
| 4.  | Guyub                 | Pakemitan     | Cimambo           |
| 5.  | Gegersuni             | Gegerkalong   | Sukasari          |
| 6.  | Teras Sadulur         | Gegerkalong   | Sukasari          |
| 7.  | Pemuda Mandiri        | Sukawarna     | Sukajadi          |
| 8.  | Selendang Mayang      | Pelindung Hewan | Astana Anyar  |
| 9.  | RW 06 Karasak         | Karasak       | Astana Anyar      |
| 10. | Pemuda                | Cibadak       | Astana Anyar      |
| 11. | Binangkit             | Panjunan      | Astana Anyar      |
| 12. | LKK Pajajaran         | Pajajaran     | Cikendo           |
| 13. | Bursa 10              | Husen Sastranegara | Cicendo   |
| 14. | Panama                | Cijerah       | Bandung Kulon    |
| 15. | Kebun Bougenvile      | Antapani Kidul | Antapani         |
| 16. | Jasmine               | Antapani Tengah | Antapani        |
| 17. | GPII                   | Kebunwaru     | Batununggal      |
| 18. | Bestari PKK           | Kacapiring     | Batununggal      |
| 19. | PKK RW 08             | Cibangkong    | Batununggal      |
| 20. | Buruan Sae Cicipung   | Kebon Gedang  | Batununggal      |
| 21. | JITU                  | Braga         | Sumur Bandung    |
| 22. | Sabilulungan          | Burangrang    | Lengkong          |
The size of the informants taken was determined from the saturation of the data in the theoretical saturation concept [11]. Secondary data were obtained from journals, previous research results, and reports from the Office of Food and Agriculture, Bandung City.

3. Result and discussion
Buruang Sae is part of the limited home yard utilization program aimed at tackling the inequality of food problem in the city of Bandung. One of the problems is that the supply of food ingredients, such as rice, meat, food, fish, and fruit, comes from outside Bandung, a metropolitan area and not a producing area. This has an impact on Bandung city, vulnerable to food availability, prone to safe and
healthy food quality, and prone to inflation because 96% of food ingredients come from other cities [12].

The solution is Buruan Sae which is actually integrated urban farming has an important impact on food independence, the food chain, and the center of excellent food security. Buruan Sae needs role stakeholders, such as major, vice mayor, legislative, and other departments, so that they can cut the long food supply chain and reduce food dependence [12]. The general profile of Buruan Sae in Bandung and the various farming technologies used in 30 sub-districts are presented in the table below (table 2).

| No | Group Name       | District            | Farming Extension Officer (PPL) | Farming Technologies                                                                 |
|----|------------------|---------------------|---------------------------------|-------------------------------------------------------------------------------------|
| 1  | Gending Mas      | Ujung berung        | Beni Komara                     | OTG, Potted Plant                                                                  |
| 2  | Al Biru Saluyu Indah | Rancasari          | Beni Komara                     | OTG, Potted Plant, Vertikal Farming, BudiKDamBer                                   |
| 3  | Guyub            | Cinambo             | Herry Suprapto                   | OTG, Potted Plant, Green House                                                     |
| 4  | Gegersuni Teras Sadulur | Sukasari        | Herry Suprapto                   | Medical Plant, Green House, Hidroponik, OTG, Potted Plant                           |
| 5  | Pemuda Mandiri   | Sukajadi            | Herry Suprapto                   | OTG, Potted Plant, Rooftop                                                         |
| 6  | Selendang Mayang | Astana Anyar        | Vivi Apanti                      | OTG (Organik Tower Garden), Potted Plant, Hidroponik, Green House, Aquaponik (BudiKDamBer) |
| 7  | LKK Pajajaran Bursa 10 | Cicendo            | Vivi Apanti                      | Hidroponik, OTG, Potted Plant, BudiKDamBer, Medical Plant                           |
| 8  | Panama           | Bandung Kulon       | Vivi Apanti                      | OTG, BudiKDamBer                                                                   |
| 9  | Kebun Bougenvile | Antapani            | Hesti R. Asri                    | OTG, Potted Plant, Medical Plant, BudiKDamBer                                      |
| 10 | GPII Bestari PKK | Batununggal         | Hesti R. Asri                    | OTG (Organik Tower Garden), Potted Plant, Hidroponik, Green House, Aquaponik (BudiKDamBer) Vertikal Farming |
| 11 | JITU             | Sumur Bandung       | Hesti R. Asri                    | OTG, Potted Plant, Hidroponik                                                      |
| 12 | Sabilulungan     | Lengkong            | Gustiar Hadiyahya                | OTG, Potted Plant, Hidroponik                                                      |
| 13 | Tamansari Sae    | Bandung Wetan       | Gustiar Hadiyahya                | OTG, Potted Plant, Hidroponik                                                      |
| 14 | Tani Sajjar Sauyunan Srikandi Jakapurwa | Bandung Kidul | Gustiar Hadiyahya                | OTG (Organik Tower Garden), Potted Plant, Aquaponik (BudiKDamBer), Vertikal Farming |
| 15 | Rumasa Berseka Pokbun Family | Andir | Susi Susilawati | OTG, Potted Plant, Rooftop, BudiKDamBer, Hidroponik |
Buruan Sae includes the cultivation of vegetables, livestock or fish, fruit trees, family medicinal plants, processed urban farming products, seedling processes, and compost processes \[5\]. For fruit trees, an example is a lime cultivation that is already practiced with the following activities: land preparation, seed preparation, planting, maintenance, harvesting, and post-harvest.

Lime (\textit{Citrus aurantifolia}) cultivation activities in Buruan Sae are done in places with good direct sunlight and the site suitability of plants as described in the table below (table 3) \[13\].
Table 3. Plant suitability [13]

| Plant suitability                  | Ranges from                                      |
|-----------------------------------|--------------------------------------------------|
| Altitude                          | 200 - 1.300 m about the sea level                |
| Annual rainfall                   | 1.000 - 1.300 mm/year                            |
| Wet month (above 100 mm/month)    | 5 - 12 months                                    |
| Dry season (month, below 60 mm/month) | 0 - 6 months                                    |
| Air temperature                   | 200 - 300 °C                                     |
| Humidity                          | medium-high                                      |
| Radiation                         | medium                                           |
| Type of soil                      | latosol, aluvial, andosol                        |
| Texture                           | loam sandy loam, clay loam                       |
| Drainage: good groundwater depth  | 40 - 170 cm from ground level                    |
| Root depth                         | below 40 cm from ground level                    |
| Acidity (pH)                      | 4 - 9                                            |
| Fertility                          | medium-high                                      |

Lime (*Citrus aurantifolia*) cultivation activities in Buruan Sae start from land preparation, seed preparation, planting, maintenance, harvesting, and ends at post-harvest through the fruit plant system in pots, often called TABULAPOT (*Tanaman Buah dalAm POT*) in Indonesia. Land preparation is done by planting holes measuring 50 cm x 50 cm x 40 cm in the topsoil separated from the soil below, then manure. After that, the soil is put back in. Furthermore, seed preparation was obtained from the results of the grafting and grafting system propagation, and then the plastic wrapping of the root media was opened and then planted. Then, planting in the prepared holes with an ideal spacing of 6 m x 6 m.

Furthermore, maintenance is carried out by taking care of plants that include the following activities: i) weeding by cleaning according to the frequency of growth, ii) timely fertilization once a month for nine months with increasing doses every month, iii) soil hoarding, often called “pembumbunan” in Indonesia, if the root base has begun to appear, iv) pruning to form the tree canopy and remove diseased, dry, or unproductive branches, v) watering at least once a week in the dry season and not to overlook the roots, vi) fruit thinning is done so that the tree is able to support growth and weight, also vii) monitoring of pests and diseases. Then, viii) harvesting is done when the limes are optimally ripe, usually between 28-36 weeks old using pruning shears with estimated productivity of each tree can produce 300 - 400 fruit/year, sometimes up to 500 fruit/year. Finally, ix) post-harvest is done by collecting in a shady and clean place; sorting and classifying; storage in a healthy place with room temperature 8 - 10 °C; also packing before shipping for local needs in bamboo baskets with a capacity of 50 - 60 kg [14, 15].

The provision of lime cultivation training at Buruan Sae was carried out for four days from November 24-27 November 2020, in the PKK Dispangtan meeting room in Bandung, Jalan Arjuna number 45 from 09.00-12.00 WIB, as shown in figure 1 and figure 2. The training expects the presence of representatives of the Buruan Sae group in each sub-district so that they can produce their own limes for their food needs. One of the successful lime cultivation is in Buruan Sae Jasmine, Rukun Warga (RW) 19, Antapani Tengah Village, Antapani District, Bandung City in February 2021 [16].

Buruan Sae Jasmine is one of the best community groups that can be used as a learning site for improvement lime cultivation. This is because Buruan Sae Jasmine is an integrated urban farming area in which there is a place for processing organic waste, fish and laying hens cultivation, vegetable cultivation, family medicinal plants, and fruit, including lime trees. Lime trees seem to be thriving because organic fertilizers in Jasmine fields are very good for meeting protein, vitamin, and nutrient intakes in the city of Bandung, especially in Antapani Tengah [16, 17].
4. Conclusion
Buruan Sae can become one of the community's efforts to support food security in the city of Bandung. As shown by training on lime cultivation, a capacity building is expected that in each sub-district's production for local food needs is strengthened. One of the best community groups that can be used as a learning site for improvement is Buruan Sae Jasmine because it can meet the needs of protein, vitamin, and nutritional intake.

5. References
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