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Community Empowerment in Tanjungan Village through a Medicinal Plants Showcase for Health Independence

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Abstract: *Tanjungan Village in Mojokerto Regency has an ecotourism area consisting of a reservoir and a forest, which has not been optimally utilized. The local community also faces limitations in managing their health independently. This community empowerment program aims to enhance health self-sufficiency through the development of a family medicinal plants (TOGA) showcase at Tanjungan Ecotourism. The program involves guidance on designing the layout of the showcase, medicinal plant cultivation techniques, and the implementation of a sprinkler irrigation system to improve water use efficiency. The results indicate a 17% increase in the community's knowledge and improved skills in planting and maintaining medicinal plants. Additionally, the use of sprinkler irrigation has reduced water consumption by up to 30%, significantly enhancing plant growth. In addition to providing health benefits, the presence of the TOGA showcase also has the potential to boost the village's tourism appeal. Therefore, the sustainability of this program needs to be maintained through the optimization of medicinal plant utilization and further assistance in post-harvest processing.*

Introduction

Tanjungan Village is one of the villages located in the Kemlagi District, Mojokerto Regency, East Java Province. This village consists of three hamlets: Jeruk Hamlet, Sukomulyo Hamlet, and Tanjungan Hamlet, each with its own unique traditions and stories. According to its monograph, Tanjungan Village is classified as a lowland area with

an elevation of 41 masl and a total area of 3.91 km^2.[1] The distance from Tanjungan Village to the capital of East Java Province, Surabaya, is approximately 60 km.

Tanjungan Village has significant potential due to its well-known natural tourist attraction, Tanjungan Ecotourism. This ecotourism site includes a reservoir and a forest. Tourist visits to Tanjungan Ecotourism are quite high, with an average of 1,000 visitors per month.[2] This environment- and culture-based tourist attraction can become a key attraction for Tanjungan Village and create a multiplier effect on the economy. It has led to the emergence of vendors at the tourist site, as well as creative businesses in culinary arts and handicrafts for souvenirs. However, the local community has not yet been able to fully optimize this potential. Beyond the economic aspect, public health is also a crucial issue, especially in the post-COVID-19 era. Every member of society must play a role in achieving both individual and community health. Health independence ensures that people remain fit and healthy while also fostering a greater sense of responsibility for their own well-being. It enables individuals to make informed decisions about a healthy lifestyle and manage their health conditions effectively.[3] However, challenges such as limited knowledge and skills in health management can hinder the community's ability to achieve health independence.

Based on discussions with the Tanjungan Village officials, it was found that the community is aware of the importance of maintaining health. This awareness is reflected in the village's work programs, which are overseen by the PKK (Family Welfare Movement) management. One of its flagship programs is the development of family medicinal plants (TOGA). TOGA consists of a collection of medicinal plants beneficial for family health, arranged into a garden that also holds aesthetic value.[4,5,6] Various studies have shown how the use of medicinal plants and ecotourism can improve community health. For instance, in Gunung Halimun Salak National Park, community-based ecotourism not only supports forest conservation but also improves the well-being and health of local communities through the utilization of medicinal plants that have been traditionally passed down through generations.[7] Meanwhile, in Nglanggeran Tourism Village, the development of ecotourism based on local wisdom has encouraged the

[1] Kartini Kartini et al., "Pelatihan Budidaya Secara Organik Untuk Mewujudkan Etalase Tanaman Obat Keluarga Di Desa Tanjungan Kabupaten Mojokerto," *RESONA: Jurnal Ilmiah Pengabdian Masyarakat* 8, no. 2 (2024).

[2] Anonim, "Profil Desa Tanjungan Kecamatan Kemlagi Kabupaten Mojokerto Tahun 2024," (2024).

[3] Priyaji Agung Pambudi, "Pandemi COVID-19: refleksi pentingnya optimasi lahan pekarangan sebagai penyokong kemandirian pangan dan kesehatan keluarga," *EnviroScienteae* 16, no. 3 (2020).

[4] R I Kementrian Kesehatan, "Peraturan Menteri Kesehatan Republik Indonesia No. 9 Tahun 2016 tentang Upaya Pengembangan Kesehatan Tradisional Melalui Asuhan Mandiri Pemanfaatan Taman Obat Keluarga dan Ketrampilan," ed. Kementerian Kesehatan Republik Indonesia (Jakarta2016).

[5] Husin Rayesh Malaleng et al., *Asuhan Mandiri Tanaman Obat* (Malang: Rena Cipta Mandiri, 2022).

[6] Kartini Kartini et al., "Meracik Tanaman Hasil Toga," (2025).

[7] Aditya Hani, Tri Sulistyati Widyaningsih, and Ratna Uli Damayanti, "Potensi dan pengembangan jenis-jenis tanaman anggrek dan obat-obatan di jalur wisata Loop-Trail Cikaniki-Citalahab Taman Nasional Gunung Halimun-Salak," *Jurnal Ilmu Kehutanan* 8, no. 1 (2014).

community to cultivate and utilize medicinal plants as part of their traditional healthcare system, positively impacting both economic welfare and public health.[8]

One initiative by the PKK management is assisting the community in utilizing their home yards to grow medicinal plants. Several types of medicinal plants have already been cultivated by residents in their respective yards. The PKK envisions guiding the community toward a healthy lifestyle in harmony with nature. However, there are several challenges in providing this assistance, particularly in the agricultural aspect. So far, the cultivation of medicinal plants has been sporadic and has not yet implemented proper agricultural practices. Community knowledge about selecting quality seeds, suitable planting media, plants that thrive in the local environment, and proper care for medicinal plants remains very limited. On the other hand, there is still unused land in the Tanjungan Ecotourism area that could be optimized. However, BUMDesa Tanjung Asri, the management body of Tanjungan Ecotourism, has yet to find an appropriate idea for developing this vacant land.

Based on these discussions, an agreement was reached between the mentoring team and partners (PKK management and BUMDesa Tanjung Asri) to develop a family medicinal plant showcase (*Etalase TOGA*) at Tanjungan Ecotourism. TOGA showcase is a designated plot of land in a public or family area where medicinal plants are cultivated in an organized manner, utilizing the land's potential while incorporating aesthetic values to create a visually appealing space.[9] With the establishment of TOGA showcase, it is expected to help the community manage their health independently while also increasing tourist visits to Tanjungan Ecotourism.

Based on the explanation above, the goal of this program is to provide assistance and facilitate the transfer of knowledge and technology to partners regarding the design and arrangement of TOGA showcase, as well as the proper on-farm management of medicinal plant cultivation. This includes selecting medicinal plants suited to Tanjungan Village's environmental conditions, seedling techniques, planting methods, irrigation techniques, and plant care practices.

Method

The partner's issues were addressed through a mentoring approach and the development of solutions based on science and technology, tailored to the partner's needs and the expertise of the mentoring team. Therefore, the activities were carried out in the following 7 steps as follow and the problem-solving framework is presented in

[8] Yosephine Elisabeth Pasaribu and Lastiani Warih Wulandari, "Identifikasi Kearifan Pola Hidup Sehat (Wellness) Lokal Masyarakat Desa Wisata Nglanggeran sebagai Upaya Adaptasi Protokol Clean, Safety, Healthy, and Environment (CHSE)," *Kepariwisataan: Jurnal Ilmiah* 15, no. 3 (2021).

[9] Zumrotun Solichah, "Yuk, Melongok Etalase Tanaman Obat di WETO Unej," Antaranews, https://jatim.antaranews.com/berita/167367/yuk-melongok-etalase-tanaman-obat-di-weto-unej.

Figure 1. To evaluate the program's impact, assessments were conducted through pre- and post-tests to measure changes in participant knowledge and skills, as well as semi-structured interviews to capture qualitative insights on participants' experiences and perceived benefits of the intervention. The pre- and post-test data allow us to quantify measurable improvements, while the interview findings provide deeper contextual understanding.

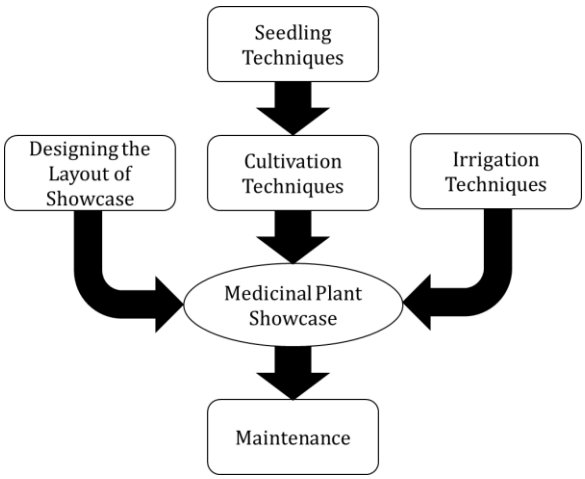

Figure 1. Problem-solving framework

Focus Group Discussion (FGD)

Discussions between the mentoring team and partners are conducted to gain a deeper understanding of the issues faced by the partners and to formulate appropriate solutions. Methods such as dialog consulting are applied to bridge communication between the mentoring team and partners, ensuring a mutual understanding of the problems and the solutions to be implemented.[10]

Designing the Layout of TOGA Showcase

The medicinal plant showcase is collaboratively designed by the partners and the mentoring team, adhering to fundamental garden design principles as follow.[11]

a. Theme (pattern): serving as a unifying element, the theme ensures cohesion and stylistic consistency throughout the garden.
b. Gradation: incorporating gradation introduces tranquil variations, establishes hierarchy, and creates a harmonious rhythm within the layout.
c. Contrast: implementing contrast adds vibrant diversity, enhances visual appeal, introduces focal points, and draws attention to specific areas.

[10] Tien Yulianti and Ari Sulistyawati, "Enhancing public speaking ability through focus group discussion," *JURNAL PAJAR (Pendidikan Dan Pengajaran)* 5, no. 2 (2021).

[11] Anton Gunarto, "Perencanaan Taman Obat Herbalia (TOBA) dalam Penataan Halaman Puskesmas," *Jurnal Rekayasa Lingkungan* 8, no. 1 (2012).

d. Control: maintaining balance through control ensures that elements are neither excessive nor deficient, resulting in a proportional and harmonious design.

These principles collectively contribute to a garden that is both aesthetically pleasing and functionally effective.

Soil Preparation

The agreed-upon area for the establishment of the TOGA showcase is a vacant lot located on the west side of the Tanjungan Reservoir. The existing condition of the land consists of grass-covered terrain with some wild plants growing. Therefore, soil preparation is necessary to ensure optimal growth of the medicinal plants. In general, the steps and techniques carried out are as follows.[12,13]

a. Clearing the land of weeds, plant residues, and stones.
b. Plowing the soil by turning it over using a tractor.
c. Harrowing to break up large soil clumps, making the soil finer and more even.
d. Creating raised beds by piling up soil or elevating the surface using soil from trench excavation as bed boundaries.

Medicinal Plant Cultivation Training

To enhance partners' knowledge and skills in planting and maintaining medicinal plants, a medicinal plant cultivation training program was conducted. Key topics that partners need to understand include the potential of medicinal plant cultivation, the health benefits of medicinal plants, types of medicinal plants, propagation systems, as well as planting and maintenance techniques. The training consisted of four stages: (1) Pre-test – Participants completed a pre-test to assess their initial knowledge level, (2) Material Presentation – The mentoring team delivered interactive lectures on relevant topics, (3) Post-test – Participants completed a post-test to evaluate their knowledge after the training, (4) Feedback and Expectations – Participants shared their impressions, feedback, and expectations with the mentoring team to determine necessary follow-up actions. The pre-test helps measure participants' baseline knowledge, while the post-test assesses the knowledge gained. The interactive lectures ensure engagement and comprehension, and the feedback session provides insights into future improvements and actions after the training.

Preparation of Medicinal Plant Seedlings

Medicinal plant seedlings can be prepared through either generative or vegetative propagation. Generative propagation is done using seeds, while vegetative propagation can be achieved through techniques such as cuttings, grafting, budding, layering, and

[12] R I Kementerian Kesehatan, *Pedoman Umum Budidaya Tanaman Obat* (Jakarta: Kemenkes RI, 2011).

[13] Muhammad Alqamari, Dafni Mawar Tarigan, and Alridiwirsah, *Budidaya Tanaman Obat & Rempah* (Medan: UMSU Press, 2017).

tissue culture.[14] For efficiency, this program acquired seedlings by purchasing them from nurseries. The types and quantities of medicinal plants to be grown in the TOGA showcase were determined beforehand. A survey was then conducted to assess the availability, quality, and pricing of seedlings at various nurseries.

Planting Medicinal Plants and Maintenance of the Showcase

The planting of medicinal plants in the TOGA showcase was carried out gradually and collaboratively by the PKK management and BUMDesa Tanjung Asri, with guidance from the mentoring team. Periodically, the mentoring team visits the site to monitor the progress of the TOGA showcase and identify any challenges faced by the partners.

Installation of a Sprinkler Irrigation System

Irrigation is a critical aspect of medicinal plant cultivation, especially during prolonged dry seasons.[15] Therefore, this program introduced technology transfer and innovation to partners through the sprinkler irrigation system, also known as spray irrigation. Sprinkler irrigation is an advanced irrigation technique that utilizes specialized equipment to distribute pressurized water evenly across the cultivated area through a spraying mechanism. Sprinkler irrigation works by spraying water into the air, allowing it to fall onto the soil surface like rainfall.[16,17] The technology transfer process has started with designing the piping system and sprinkler placement, followed by installation, testing, regular use, and maintenance.

Result

Formulation of Solution

The discussion in the form of an FGD (Focus Group Discussion) (Figure 2) served as the initial stage of this mentoring program. This stage revealed that the partners lacked sufficient knowledge and skills regarding the layout design of the TOGA showcase and plant management practices. The key outcome of this stage was an agreement between the partners and the mentoring team to establish the TOGA showcase in the Tanjungan Ecotourism area.

[14] Muhammad Alqamari, Dafni Mawar Tarigan, and Alridiwirsah, *Budidaya Tanaman Obat & Rempah*

[15] Muhammad Alqamari, Dafni Mawar Tarigan, and Alridiwirsah, *Budidaya Tanaman Obat & Rempah*

[16] Robert G Evans et al., "Adoption of site-specific variable rate sprinkler irrigation systems," *Irrigation science* 31(2013).

[17] Haijun Yan et al., "Development in sprinkler irrigation technology in China," *Irrigation and Drainage* 69(2020).

Figure 2. FGD between the mentoring team and partners (left), and initial site inspection (right)

Designing the Layout of the TOGA Showcase

The TOGA showcase at Tanjungan Ecotourism was designed by incorporating garden design principles, as outlined in the method section. The applied garden pattern or model followed a modern or semi-formal layout, which combines elements of both formal and informal designs. This pattern emphasizes the harmonization of vertical and horizontal lines, along with simplified shapes that do not focus on intricate details. The initial layout design of the TOGA showcase is presented in Figure 3.

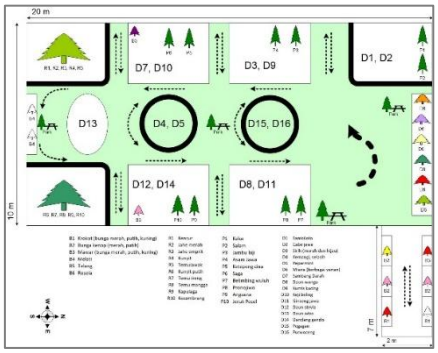

Figure 3. Layout of the TOGA showcase at Tanjungan Ecotourism

Soil Preparation

The grassy land on the west side of the Tanjungan Reservoir, allocated for the TOGA showcase, was prepared through a series of processes, including grass clearing, soil loosening, irrigation, and fertilization. These activities were carried out gradually by the partners under the guidance of the mentoring team (Figure 4).

Figure 4. Land preparation process for the TOGA showcase

Training on Medicinal Plant Cultivation

To enhance the knowledge and skills of partners in establishing the TOGA Showcase, training on medicinal plant cultivation was conducted (Figure 5). The training took place at the Tanjungan Ecotourism Cultural Stage. The materials covered in this training included the potential of medicinal plant cultivation, the health benefits of medicinal plants, types of medicinal plants, propagation systems, planting methods, and plant care techniques.

The training participants consisted of 25 people. The activity began with a pre-test, followed by the delivery of materials using a lecture and discussion method. After the material session was completed, a post-test was conducted to measure participants' knowledge levels after the training. A summary of the pre-test and post-test results for each knowledge domain and total knowledge is presented in Figure 6. The figure shows an increase in knowledge scores across all domains. The total knowledge score increased from 71 to 83, representing a 17% improvement. Statistical analysis using the Wilcoxon matched pairs test indicated a significant increase in total knowledge scores after the training ($p = 0.0002$). This suggests that the training was effective in enhancing participants' knowledge regarding medicinal plant cultivation.

Figure 5. Atmosphere of the medicinal plant cultivation training

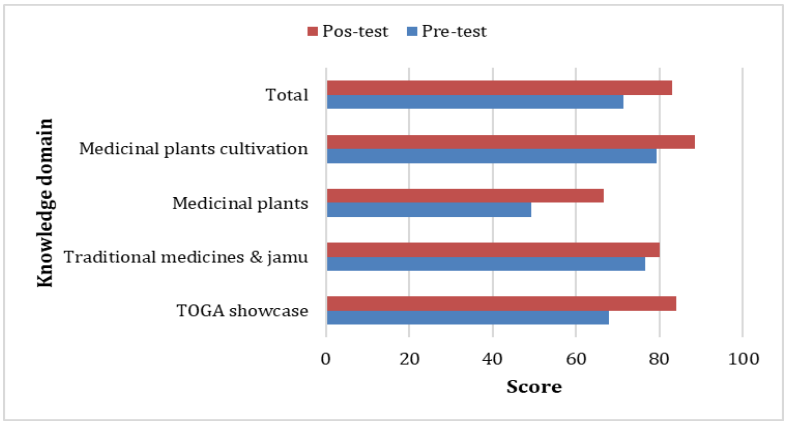

Figure 6. Comparison of knowledge levels before and after the medicinal plant cultivation training

Procurement of Medicinal Plant Seedlings

The TOGA showcase at Tanjungan Ecotourism has a limited land area of 456 m^2. Therefore, the medicinal plants selected for cultivation must meet the following criteria: they should be essential and beneficial for daily family health maintenance, easy to cultivate, space-efficient due to their canopy size, and suitable for the land conditions, including soil contour, shape, and the presence of trees or other structures. Based on these criteria, 29 types of medicinal plants were chosen for cultivation.[18,19,20] These plants are presented in Table 1.

Tabel. 1 List of medicinal plants grown in the TOGA showcase

No.	Scientific name	Local name	Habitus	Usage
1	*Psidium guajava*	*Jambu Biji*	Tree	Antidiarrheal, antibacterial
2	*Zingiber officinale*	*Jahe*	Herb	Boosts immune system, relieves colds, insect repellent, antifertility, antibacterial
3	*Senna alata*	*Ketepeng Cina*	Tree	Treats worm infections, tinea versicolor, ringworm, constipation, and mouth ulcers
4	*Curcuma longa*	*Kunyit*	Herb	Alleviates fatigue, digestive disorders, protects liver function, gallstones, fever, hemorrhoids, diarrhea, dysentery, acne, eczema, chickenpox, and nausea
5	*Abrus precatorius*	*Saga*	Tree	Relieves productive cough, anti-inflammatory, treats mouth ulcers
6	*Clitoria ternatea*	*Telang*	Climber	Antioxidant, helps maintain heart, brain, skin, and hair health, and aids in lowering blood pressure and blood sugar levels
7	*Euphorbia tirucalli*	*Patah Tulang*	Herb	Relieves toothache, heals wounds, and treats broken bones
8	*Piper retrofractum*	*Cabe Jawa*	Herb	Reduces fever, lowers cholesterol, treats erectile dysfunction, aphrodisiac, relieves colds

[18] Kementerian Kesehatan, *Pedoman Umum Budidaya Tanaman Obat*.

[19] R I Kementerian Kesehatan, *Pedoman Budidaya, Panen dan Pascapanen Tanaman Obat* (Jakarta: Kemenkes RI, 2015).

[20] Y Widiyastuti et al., "Vademekum Tanaman Obat untuk Saintifikasi Jamu Jilid 1," *Lembaga Penerbit Badan Penelitian dan Pengembangan kesehatan, Jakarta* (2012).

9	*Clinacanthus nutans*	*Dandang Gendis*	Herb	Antioxidant, anticancer, antidiabetic, boosts immunity, regulates blood sugar, and alleviates kidney disorders
10	*Polyscias scutellaria*	*Mangkokan*	Shrub	Aids wound healing, stimulates hair growth, reduces body odor, antioxidant, and antimicrobial
11	*Portulaca oleracea*	*Krokot*	Herb	Lowers blood pressure, prevents heart disease, reduces cholesterol, and prevents diabetes
12	*Ocimum basilicum*	*Kemangi*	Herb	Helps eliminate bad breath
13	*Menthae piperatae*	*Peppermint*	Herb	Relieves sore throat, soothes insect bites, antibacterial, muscle relaxant, and carminative (relieves gas)
14	*Coleus scutellarioides*	*Miana*	Herb	Anti-inflammatory, treats hemorrhoids, accelerates wound healing, antibacterial, and promotes menstruation
15	*Talinum paniculatum*	*Ginseng Jawa*	Herb	Treats erectile dysfunction, aphrodisiac, anti-inflammatory, and central nervous system stimulant
16	*Anredera cordifolia*	*Binahong*	Climber	Heals wounds, treats acne, and lowers cholesterol
17	*Excoecaria cochinchinensis*	*Sambang Darah*	Shrub	Treats itching, bleeding, dysentery, vomiting, and bloody cough
18	*Hibiscus sabdariffa*	*Rosela*	Shrub	Prevents high blood pressure and constipation
19	*Gomphrena globosa*	*Bunga Kenop*	Herb	Antioxidant, antibacterial, and antifungal
20	*Rosa cinnamomea*	*Bunga Mawar*	Shrub	Aids in weight loss, reduces stress, and alleviates hemorrhoid symptoms
21	*Zinnia L.*	*Kembang Ratna*	Shrub	Antioxidant, antibacterial, and antifungal
22	*Orthosiphon stamineus*	*Kumis Kucing*	Herb	Promotes urination, dissolves kidney stones, relieves high blood pressure, and soothes back pain

23	*Ocimum basilicum*	*Selasih*	Herb	Strengthens bones and teeth, controls cholesterol and blood sugar, boosts immunity, and supports digestive health
24	*Andrographis paniculata*	*Sambiloto*	Herb	Treats diabetes, high blood pressure, cholesterol, and fights diarrhea-causing bacteria
25	*Cymbopogon citratus*	*Sereh Dapur*	Herb	Relieves muscle aches, antibacterial, antifungal, alleviates bloating, and colds
26	*Curcuma xanthorrhiza*	*Temulawak*	Herb	Combats fatigue, aids digestion, protects liver function, treats gallstones, fever, hemorrhoids, diarrhea, dysentery, acne, eczema, chickenpox, and nausea
27	*Moringa oleifera*	*Kelor*	Tree	Addresses anemia, hepatitis, antioxidant, antimicrobial, improves digestion, diabetes, anti-inflammatory, and anticancer
28	*Kaempferia galanga*	*Kencur*	Herb	Relieves migraines, treats sprains, and soothes muscle pain
29	*Syzygium polyanthum*	*Salam*	Tree	Treats diabetes, high blood pressure, cholesterol, and fights diarrhea-causing bacteria

After determining the types and quantities of medicinal plants to be planted, a survey was conducted to procure seedlings from several nurseries, including Bratang Flower Market in Surabaya, the Urban Community Empowerment Center (Pusdakota) at the University of Surabaya, and the nursery at Universitas Veteran Jawa Timur. Based on several considerations, it was decided that the seedlings would be supplied by Pusdakota Ubaya and the Universitas Veteran Jawa Timur nursery. The seedling delivery process is shown in Figure 7.

Figure 7. Medicinal plant seedling delivery process

Planting and Maintenance of Medicinal Plants in the TOGA Showcase

The planting of medicinal plants in the TOGA showcase was carried out in stages through a collaborative effort involving the PKK management and BUMDesa Tanjung Asri, under the guidance of the mentoring team (Figure 8). After the planting process, the partners independently took care of the medicinal plants, primarily by watering them regularly every morning and evening (Figure 9). To monitor the progress, the mentoring team conducted periodic field evaluations (Figure 9).

Figure 8. Planting of medicinal plants in the TOGA showcase

Figure 9. Maintenance of the TOGA showcase by partners and monitoring by the mentoring team

Two months after planting, it was observed that most medicinal plants were growing well, with some even starting to bloom (Figure 10). However, certain plants did not thrive as expected, likely due to the extremely high temperatures.

Figure 10. Condition of some medicinal plants at 2 months after planting

In a garden, there are typically two main elements, hardscape and softscape. Hardscape refers to non-living, human-made elements that provide structure, such as ground surfaces, pavements, pathways, and garden buildings. Softscape consists of living components, including various types of plants, animals, and even people who interact within the garden. Hardscape elements enhance the functional aspects of a garden, while softscape elements soften and complement the hardscape, creating a balanced and aesthetically pleasing environment. A well-proportioned combination of both elements optimizes the garden's function and enhances its beauty.[21] To further beautify the TOGA showcase at Tanjungan Ecotourism, maintenance efforts included landscaping and the installation of hardscape elements (Figure 11). The hardscape elements implemented in the TOGA showcase included garden plot borders in rectangular and circular shapes made from lightweight bricks, pathways made from paving blocks and cement stepping stones, and a lotus-shaped fountain placed at the center of the TOGA showcase.

Figure 11. Process and results of hardscape element installation in the TOGA showcase

The sprinkle irrigation system

The sprinkler irrigation system is a technology and innovation selected by the mentoring team to be transferred to partners. This irrigation system ensures even and efficient water distribution across the cultivated area. It is particularly suitable for regions with low wind speeds, minimizing water loss due to evaporation. As a result, a

[21] Gunarto, "Perencanaan Taman Obat Herbalia (TOBA) dalam Penataan Halaman Puskesmas."

higher irrigation efficiency can be achieved.[22,23] The piping system design and sprinkler placement are illustrated in Figure 12, where dots along the lines indicate sprinkler installation points. Meanwhile, the installation results are shown in Figure 13.

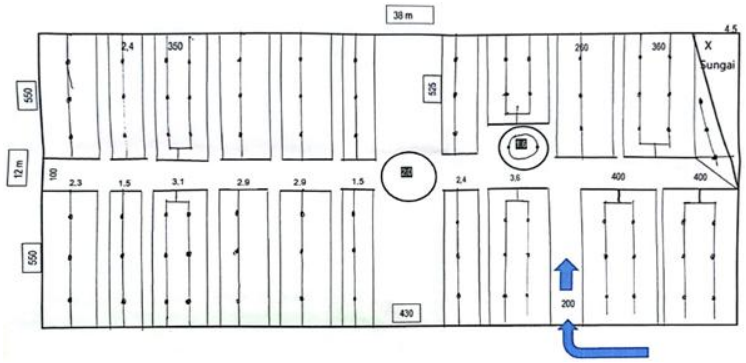

Figure 12. Design of the piping system and sprinkler placement

Figure 13. Implementation results of sprinkler irrigation technology in the TOGA showcase

Discussion

Various efforts can be made by the community for the maintenance, improvement, and restoration of health, as well as for disease prevention and treatment, including the use of medicinal plants. Medicinal plants can be cultivated in limited spaces, such as home gardens or yards.[24,25] Additionally, they can be planted in public facilities such as roadsides, small plots of land near reservoirs or lakes, city parks, schools, offices, and more. To ensure that these plants do not interfere with the primary function of the land, they can be arranged using the concept of a showcase garden or thematic garden. To optimize the Tanjungan Ecotourism area, this mentoring program has focused on the

[22] Yan et al., "Development in sprinkler irrigation technology in China."

[23] Rahmad Dwi Putra et al., "A Review of Climate Change Effect on Groundwater Irrigation in Indonesia " (paper presented at the 3rd World Irrigation Forum (WIF3), Bali, Indonesia, 2019).

[24] Setiyo Utomo et al., "Pemanfaatan Lahan Pekarangan dengan Tanaman Obat Keluarga (TOGA) dan Pembuatan POC " *Ruhui Rahayu: Jurnal Pengabdian kepada Masyarakat* 2, no. 2 (2023).

[25] I Kadek Wiranatha, Anak Agung Keswari Krisnandika, and I Made Agus Dharmadiatmika, "Model Desain Taman TOGA Pekarangan Rumah Desa Bukian, Kecamatan Payangan, Kabupaten Gianyar " *Jurnal Lanskap Indonesia* 13, no. 2 (2021).

development of the TOGA showcase (*Etalase TOGA*) in Tanjungan Ecotourism.

The term "etalase" originates from the French word *étalage*, which means arrangement or exhibition. In general, *etalase* refers to a glass display case, box, or rack used to showcase various items, such as artwork in galleries, antiques in museums, or merchandise in stores. Meanwhile, a garden is an area that consists of both hardscape and softscape elements, which complement each other and are intentionally designed to create a refreshing environment for both indoor and outdoor spaces.[26] Thus, a medicinal plant showcase (*Etalase TOGA*) can be interpreted as a designated plot of land in a public or private space, planted with medicinal plants that are arranged according to the land's potential while incorporating aesthetic values, making it visually appealing.

A total of 29 types of medicinal plants have been planted in the TOGA showcase at Tanjungan Ecotourism. These plants provide a variety of medicinal benefits. For instance, bay leaves help lower uric acid levels, bitter leaves (*sambiloto*) help reduce blood sugar levels, *saga* leaves relieve coughs, basil leaves freshen breath, ginger rhizomes alleviate pain, and roselle flowers boost the immune system, and among others.[27,28] The plant habits also vary, including herbs such as Javanese ginseng, shrubs such as roses, and trees such as *ketepeng Cina*.[29]

Medicinal plants require various maintenance activities, such as watering, fertilizing, loosening the soil, weeding, replanting, as well as pest and disease control.[30,31] The application of technology and innovation is crucial in medicinal plant care to ensure optimal production of secondary metabolites. The technology and innovation introduced to the partners in this program is the sprinkler irrigation system.

The main components of this irrigation system include a water pump, distribution pipes, sprinklers (which break water into small droplets), and an automatic control device. The sprinkler irrigation system offers several advantages, including: efficient water use, even water distribution, suitable for various types of land, including flat areas such as the TOGA showcase, compatible with different types of plants, including gardens, reduces soil erosion, saves energy and time, prevents excessive weed growth, and increases plant productivity.[32,33] To support the implementation of sprinkler irrigation, training sessions were conducted for partners on system installation and maintenance. Additionally, they were taught how to measure water requirements to prevent water shortages in the storage tank.

[26] Gunarto, "Perencanaan Taman Obat Herbalia (TOBA) dalam Penataan Halaman Puskesmas."
[27] Malaleng et al., *Asuhan Mandiri Tanaman Obat*.
[28] Susi Mindarti and Bebet Nurbaeti, "Buku Saku Tanaman Obat Keluarga (TOGA)," (Balai Pengkajian Teknologi Pertanian Jawa Barat, 2015).
[29] Kartini et al., "Meracik Tanaman Hasil Toga."
[30] Kementerian Kesehatan, *Pedoman Umum Budidaya Tanaman Obat*.
[31] Alqamari, Tarigan, and Alridiwirsah, *Budidaya Tanaman Obat & Rempah*.
[32] Evans et al., "Adoption of site-specific variable rate sprinkler irrigation systems."
[33] Yan et al., "Development in sprinkler irrigation technology in China."

The implementation of sprinkler irrigation technology in the TOGA showcase at Tanjungan Ecotourism is highly relevant to the needs and challenges faced by the local community. This technology or innovation is necessary because:

a. This sprinkler irrigation system was designed to address water access issues faced by partners in Tanjungan village, which experiences low rainfall and limited water resources.
b. With this technology, partners can save up to 30% of water usage (Figure 14) and significantly enhance the growth of medicinal plants.
c. Besides water efficiency, this technology helps maintain soil fertility and reduce erosion risk, ensuring that agriculture remains productive in the future.

Figure 14. Comparison of water consumption between conventional irrigation (left) and sprinkler irrigation (right)

One of the main challenges of this program is the prolonged dry season, which makes it difficult for plants to grow optimally. To address this, partner participation is the key to the successful implementation of technology and innovation. In this program, partners are actively involved through the following approaches:

a. Discussions were held with partners to understand their needs and gather input before selecting the most suitable irrigation system.
b. Training sessions were provided to ensure that partners could operate and maintain the bulk irrigation system effectively.
c. The irrigation equipment was facilitated by the mentoring team's program, but its maintenance is the responsibility of the partners.
d. Partners were involved in regular system inspections and provided feedback for further improvements, such as checking clogged sprinklers and finding solutions to address the issue.

In addition to being showcased to the public for educational purposes and enhancing the appeal of Tanjungan Ecotourism, medicinal plants in the TOGA showcase can also be harvested for further use. The harvesting and post-harvest process of

medicinal plants includes harvesting, wet sorting, washing, draining, drying, dry sorting, packaging, and storage. The harvesting and post-harvest process of medicinal plants requires special treatment, which differs from food crops or plantation crops.[34,35,36] Therefore, further mentoring is needed to enhance partners' knowledge and skills in the harvesting and post-harvest handling of medicinal plants.

Conclusion

The village empowerment program through the development of the TOGA showcase at Tanjungan Ecotourism has successfully optimized unused land for medicinal plant cultivation while serving as an educational platform for the community. The mentoring process, including training in cultivation techniques and the sprinkler irrigation system, has improved partners' understanding and skills in managing medicinal plants. The TOGA showcase not only supports community health independence through the use of medicinal plants but also enhances the village's tourism appeal. However, key challenges include plant maintenance under extreme weather conditions and ensuring the program's sustainability beyond the mentoring period.

To ensure long-term sustainability, several concrete steps are recommended. First, further training on post-harvest processing—such as drying, extraction, and packaging techniques—should be provided to help the community increase the economic value of medicinal plants. Second, the formation of a dedicated management group consisting of local farmers and community representatives is essential to oversee the ongoing maintenance and development of the TOGA showcase. Third, collaboration with academic institutions and the village government should be strengthened to support research, innovation, and market access for medicinal plant-based products. Finally, regular monitoring and maintenance of the sprinkler irrigation system must be carried out to optimize water usage efficiency, especially during prolonged dry seasons. By implementing these measures, the TOGA showcase has the potential to become a sustainable community asset that not only promotes health independence but also contributes to local economic development and ecotourism growth.

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[34] Kementerian Kesehatan, *Pedoman Budidaya, Panen dan Pascapanen Tanaman Obat*.

[35] Anjali Thakur, Babita Thakur, and Rakesh Kumar, "Post-harvest management of medicinal and aromatic plants: Current trends and recent advances," *Journal of Essential Oil Bearing Plants* (2025).

[36] Hakibu Tanko et al., "Pre-and post-harvest processing of medicinal plants," *Plant Genetic Resources* 3, no. 2 (2005).

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References

Alqamari, Muhammad, Dafni Mawar Tarigan, and Alridiwirsah. *Budidaya Tanaman Obat & Rempah*. Medan: UMSU Press, 2017.

Anonim. "Profil Desa Tanjungan Kecamatan Kemlagi Kabupaten Mojokerto Tahun 2024." (2024).

Evans, Robert G, Jake LaRue, Kenneth C Stone, and Bradley A King. "Adoption of Site-Specific Variable Rate Sprinkler Irrigation Systems." *Irrigation science* 31 (2013): 871-87.

Gunarto, Anton. "Perencanaan Taman Obat Herbalia (Toba) Dalam Penataan Halaman Puskesmas." *Jurnal Rekayasa Lingkungan* 8, no. 1 (2012): 27-41.

Hani, Aditya, Tri Sulistyati Widyaningsih, and Ratna Uli Damayanti. "Potensi Dan Pengembangan Jenis-Jenis Tanaman Anggrek Dan Obat-Obatan Di Jalur Wisata Loop-Trail Cikaniki-Citalahab Taman Nasional Gunung Halimun-Salak." *Jurnal Ilmu Kehutanan* 8, no. 1 (2014): 42-49.

Kartini, Kartini, Ramdan Hidayat, Idfi Setyaningrum, and Jatie Kusmiati Kusna Pudjibudojo. "Meracik Tanaman Hasil Toga." (2025).

Kartini, Kartini, Idfi Setyaningrum, Ramdan Hidayat, and Jatie K Pudjibudojo. "Pelatihan Budidaya Secara Organik Untuk Mewujudkan Etalase Tanaman Obat Keluarga Di Desa Tanjungan Kabupaten Mojokerto." *RESONA: Jurnal Ilmiah Pengabdian Masyarakat* 8, no. 2 (2024): 247-58.

Kementerian Kesehatan, R I. *Pedoman Budidaya, Panen Dan Pascapanen Tanaman Obat*. Jakarta: Kemenkes RI, 2015.

———. *Pedoman Umum Budidaya Tanaman Obat*. Jakarta: Kemenkes RI, 2011.

Kementrian Kesehatan, R I. "Peraturan Menteri Kesehatan Republik Indonesia No. 9 Tahun 2016 Tentang Upaya Pengembangan Kesehatan Tradisional Melalui Asuhan Mandiri Pemanfaatan Taman Obat Keluarga Dan Ketrampilan." edited by Kementerian Kesehatan Republik Indonesia. Jakarta, 2016.

Malaleng, Husin Rayesh, Siti Mudaliana, Fitria Rahmawati, Sabriana Aprilisa Martha, Rocky Fahriar Reza, and Ratna Yulianti. *Asuhan Mandiri Tanaman Obat*. Malang: Rena Cipta Mandiri, 2022.

Mindarti, Susi, and Bebet Nurbaeti. "Buku Saku Tanaman Obat Keluarga (Toga)." Balai Pengkajian Teknologi Pertanian Jawa Barat, 2015.

Pambudi, Priyaji Agung. "Pandemi Covid-19: Refleksi Pentingnya Optimasi Lahan Pekarangan Sebagai Penyokong Kemandirian Pangan Dan Kesehatan Keluarga." *EnviroScienteae* 16, no. 3 (2020): 408-23.

Pasaribu, Yosephine Elisabeth, and Lastiani Warih Wulandari. "Identifikasi Kearifan Pola Hidup Sehat (Wellness) Lokal Masyarakat Desa Wisata Nglanggeran Sebagai

Upaya Adaptasi Protokol Clean, Safety, Healthy, and Environment (Chse)." *Kepariwisataan: Jurnal Ilmiah* 15, no. 3 (2021): 162-72.

Putra, Rahmad Dwi, Andre Putra Arifin, Ahmad Taufiq, and Anggita Agustin. "A Review of Climate Change Effect on Groundwater Irrigation in Indonesia " Paper presented at the 3rd World Irrigation Forum (WIF3), Bali, Indonesia, 2019.

Solichah, Zumrotun. "Yuk, Melongok Etalase Tanaman Obat Di Weto Unej." Antaranews, https://jatim.antaranews.com/berita/167367/yuk-melongok-etalase-tanaman-obat-di-weto-unej.

Tanko, Hakibu, Danielle Julie Carrier, Lijun Duan, and Ed Clausen. "Pre-and Post-Harvest Processing of Medicinal Plants." *Plant Genetic Resources* 3, no. 2 (2005): 304-13.

Thakur, Anjali, Babita Thakur, and Rakesh Kumar. "Post-Harvest Management of Medicinal and Aromatic Plants: Current Trends and Recent Advances." *Journal of Essential Oil Bearing Plants* (2025): 1-23.

Utomo, Setiyo, Ahmad Ali Sombili, Dinda Amelia Damanik, and Christina Natalia Lun. "Pemanfaatan Lahan Pekarangan Dengan Tanaman Obat Keluarga (Toga) Dan Pembuatan Poc ". *Ruhui Rahayu: Jurnal Pengabdian kepada Masyarakat* 2, no. 2 (2023): 108-13.

Widiyastuti, Y, S Haryanti, N Supriyati, Sugiarso S Katno, A Damayanti, D Subositi, E Widayanti*, et al.* "Vademekum Tanaman Obat Untuk Saintifikasi Jamu Jilid 1." *Lembaga Penerbit Badan Penelitian dan Pengembangan kesehatan, Jakarta* (2012).

Wiranatha, I Kadek, Anak Agung Keswari Krisnandika, and I Made Agus Dharmadiatmika. "Model Desain Taman Toga Pekarangan Rumah Desa Bukian, Kecamatan Payangan, Kabupaten Gianyar ". *Jurnal Lanskap Indonesia* 13, no. 2 (2021): 45-53.

Yan, Haijun, Xin Hui, Maona Li, and Yuncheng Xu. "Development in Sprinkler Irrigation Technology in China." *Irrigation and Drainage* 69 (2020): 75-87.

Yulianti, Tien, and Ari Sulistyawati. "Enhancing Public Speaking Ability through Focus Group Discussion." *JURNAL PAJAR (Pendidikan Dan Pengajaran)* 5, no. 2 (2021): 287-95.