Agroedutourism-Based Community Empowerment Strategy as the Implementation of a Sustainable Agriculture Program in Batulaya Village, West Sulawesi

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Abstract

The empowerment of communities as a concept of economic development encapsulates social values. Agroedutourism (AET) is one of the creative economic potentials in the agricultural sector that can positively impact the community's welfare. The development of agriculture-based sustainable agroedutourism integrates the excellent potential of Batulaya Village by conducting a mapping of internal and external factors analyzed using SWOT (Strengths, Weaknesses, Opportunities, and Threats). The number of respondents and community empowerment partners is 30 individuals, consisting of Batulaya Village government officials, youth groups, farmer groups, and PKK groups (Family Welfare Movement). The strengths include infrastructure, transportation access, natural resources, human resources, and land. Opportunities include educational activities and cultural tourism, often carried out in Batulaya Village. The appropriate development strategy for Batulaya Village's agroedutourism is to leverage the natural resources and tourism potential to attract community members or tourists to visit. Socialization, mentoring, and training have been conducted for hydroponic and aquaponic cultivation of plants and the management of organic household waste in Batulaya Village using the Black Soldier Fly (BSF). BSF infrastructure has been established to produce maggots that can be used as fish feed in the aquaponic system and generate organic fertilizer for hydroponics. Therefore, these three systems mutually support each other and sustain sustainable agricultural agroedutourism in Batulaya Village. The village government focuses on developing appropriate and sustainable agricultural products, thus providing more precise land management and investment allocation directions. The feasibility of investment and future agroedutourism development can be maximized and more focused.

Keywords: *Community Empowerment, Agroedutourism, Sustainable Agriculture*

1. Introduction

Agroedutourism in Indonesia is essential to stimulating economic growth and attracting domestic and international tourists. This sector is strategically situated in regions with cool climates and breathtakingly natural landscapes. These locations serve as alluring destinations for visitors who seek to relish the beauty of nature while gaining insights into natural and modern methods of product processing (Bwana et al., 2015). One such place is Batulaya Village, an iconic tourist spot in

Polewali Mandar Regency, West Sulawesi. This village boasts abundant tourism potential owing to its captivating natural beauty and a unique blend of cultural and geospatial tourism assets. Furthermore, the potential of marine tourism, a distinctive feature of Batulaya Village, serves to captivate visitors' interest. The village also offers diverse, economically creative locations encompassing agriculture, fisheries, and animal husbandry (Akbar et al., 2022). Sustainable agriculture integrates several factors within a systemic framework. These factors include agronomy, ecology, economics, and social and cultural dimensions (Salikin, 2003). According to Rival & Anugrah (2011), sustainable agricultural development in rural villages has become a strategic issue, receiving primary attention and being a worldwide discussion topic. Besides being a desired outcome, sustainable agricultural development has emerged as a fundamental paradigm in shaping agricultural developmental patterns.

Batulaya Village thrives on agriculture and animal husbandry as its primary sources of income. The agricultural potential in this area is supported by extensive land availability and human resource potential that can be sustainably empowered. Budiarti et al. (2013) highlighted the crucial role of the agricultural sector in generating employment opportunities and income for a significant portion of rural households in Indonesia. Despite these income sources, the Medium-Term Development Plan, or RPJM, in this village requires help in achieving its desired objectives. RPJM for Batulaya Village consists of two flagship programs aimed at community economic empowerment. These programs involve non-productive community groups such as the Batulaya Village Youth Organization or Karang Taruna and productive community groups such as the Bulu Sirua Farmer Group. Despite being in an agricultural area, both of these groups confront various challenges that directly impact the local community's welfare. The Batulaya Village Youth Organization has solely focused on cultivating the Black Soldier Fly (BSF). In contrast, the Bulu Sirua Farmer Group concentrates on conventional farming practices such as rice cultivation and hydroponic vegetable farming.

Given the challenges, a sustainable agroedutourism development strategy is needed for Batulaya Village. This promising approach aims to educate the local community about the significance of sustainable agriculture. Pambudi (2018) suggested several strategies, including educational approaches involving interaction and developing educational programs that encourage active visitor engagement. This could encompass farm tours, agricultural workshops, and direct participation in activities like gardening or harvesting. Through these initiatives, visitors can gain profound insights into sustainable agricultural practices. Collaboration with farmers and agricultural experts is required, involving local farmers and agricultural specialists in designing agroedutourism programs. This collaboration ensures accurate information and valuable knowledge exchange among visitors, farmers, and experts. Another activity is introducing local products and processed goods and presenting visitors with locally produced agricultural goods. This step allows farmers to diversify their income sources while supporting the local economy. Leveraging supportive technology, such as agricultural sensors, data analysis, and social media to enhance visitor experiences and monitor agricultural performance more efficiently.

Other supporting factors for sustainable agroedutourism development include community awareness. Increased awareness in society about the importance of sustainable agriculture and environmental aspects creates a strong demand for agricultural education. Government support is vital, too, as policies and incentives encouraging sustainable agriculture and tourism provide the impetus for agroedutourism development. Tourism growth also creates opportunities for agroedutourism to thrive as an alternative form of educational and sustainable tourism (Supriadi,

2021). A SWOT analysis is essential to evaluating the potential of sustainable agroedutourism development.

Considering the issues and potential outlined above, implementing the Empowerment Program for Partner Villages, "Farming for the Future: Agroedutourism-Based Community Assistance as a Model for Sustainable Agriculture in Batulaya Village, West Sulawesi." This program constitutes a community empowerment initiative in Batulaya Village that intends to promote sustainable agriculture through an agroedutourism-based approach.

2. Material and Methods

The research and community service program was conducted from June to August 2023 in Batulaya Village, Tinambung Subdistrict, Polewali Mandar Regency, West Sulawesi Province. The data utilized in this study encompassed both primary and secondary data. Primary data were collected directly from the Agroedutourism Development Area in Batulaya Village through on-site observations, interviews with village government officials and community members, and questionnaire surveys. The questionnaire surveys aimed to analyze community empowerment strategies for developing agroedutourism based on sustainable agriculture. Respondents, totaling 30 individuals, were selected based on their contributions to formulating and implementing strategies in the Batulaya Village agroedutourism area. Among them were four village government officials, nine members from the Batulaya Village youth organization, nine farmer groups, and eight Batulaya Village Women's Group (PKK) members. Secondary data were sourced from relevant agencies or departments, Batulaya Village documents, articles, books, and research findings related to village agroedutourism programs.

The collected data were analyzed using descriptive analysis and SWOT analysis. According to Rangkuti (2015), internal and external strategic factor analysis involves processing strategic factors in the internal and external environment. The internal environment analysis aims to identify strengths and weaknesses, while the external environment analysis aims to identify opportunities and threats. Strategic issues that are monitored must be determined, as they may affect the future potential of agroedutourism. The SWOT analysis method was employed to identify community empowerment strategies in developing Batulaya Village agroedutourism. According to Yunas (2023), SWOT analysis involves comparing external factors (opportunities and threats) with internal factors (strengths and weaknesses).

The community service programs were conducted through training and mentoring sessions on hydroponic vegetable cultivation to implement sustainable agriculture concepts, as well as training on organic waste processing for maggot BSF cultivation. The target participants included village government officials of Batulaya and partner groups, namely the Batulaya Village Youth Organization, farmer groups, and the Family Welfare Movement group (PKK). As per Nawawi et al. (2023), the activity comprised four stages: (1) preparation stage, (2) training stage, (3) mentoring stage, and (4) evaluation stage. The preparation stage involved location observation, interviews, the permitting process, and preparing training materials, tools, and supplies. In the training stage, the implementing team and guest speakers provided materials on hydroponic systems, aquaponic fish farming, and maggot BSF cultivation. The third stage encompassed mentoring in hydroponic, aquaponic, and maggot BSF cultivation practices conducted by the Batulaya Village Youth Organization, farmer groups, and the Family Welfare Movement group. The mentoring activities spanned approximately one month. The final stage, evaluation, encompassed assessing the program from preparation through the implementation process to the end of the activities.

3. Results and Discussion

3.1. SWOT Matrix Analysis

Limitations exist when conducting a professional assessment of internal and external strategic factors. In the internal environment, the level of importance is based on the extent of influence the strategic factors have on its strategic position. In contrast, in the external environment, it is based on the potential to impact its strategic factors (Rangkuti, 2015).

Table 1.
Determination of Strategies Based on SWOT Matrix Analysis

	Strengths (S)	Weaknesses (W)
Internal	1. Natural resources. 2. Land availability. 3. Transportation access. 4. Government and community support.	1. The village-one enterprise just established. 2. Agricultural infrastructure. 3. Farmers' knowledge and skills. 4. Agricultural production is yet to be optimal. 5. Marketing programs.
Eksternal		
Opportunities (O)	Strategies S-O	Strategies W-O
1. Tourism prospects. 2. Educational and cultural activities. 3. Market demand. 4. Implementation of sustainable agriculture.	1. Utilizing natural resources in implementing sustainable agriculture to support the tourism prospects of Batulaya Village (S1-O1-O4). 2. Land availability can support the expansion of sustainable agriculture implementation (S2-O4). 3. Transportation access can enhance tourism prospects and market needs (S3-O1-O3). 4. Government and village community support facilitates the implementation of educational and cultural activities for the agroedutourism potential (S4-O2). 5. Government and village community support enhance the implementation of sustainable agriculture (S4-O3).	1. The newly established village-owned enterprise and marketing program can support market needs and tourism prospects (W1-W5-O3-O1). 2. Enhancing agricultural infrastructure to support the implementation of sustainable agriculture, educational, and cultural activities (W2-O4-O2). 3. Improving farmers' knowledge and skills in the marketing program to bolster the implementation of sustainable agriculture and tourism prospects (W3-W5-O4-O1). 4. Maximizing agricultural production to meet market demands (W2-O3).
Threats (T)	Strategies S-T	Strategies W-T
1. Agroedutourism visitor interest. 2. Uncertain climatic conditions. 3. Investment costs and facility development.	1. Harnessing the potential of natural resources to enhance visitor interest in agro-educational tourism in Batulaya Village (S1-T1). 2. Improving transportation access and land availability to attract visitors even in unpredictable climate conditions (S2-S3-T2). 3. Government and village community support to facilitate investor entry, thereby increasing investment costs and rural agroedutourism facility development (S4-T2).	1. Optimizing the newly established village-owned enterprise to facilitate investor entry for investment costs and facility development (W1-T3). 2. Enhancing agricultural infrastructure to boost visitor interest in agroedutourism under unpredictable climate conditions (W2-T1-T2). 3. Enhancing marketing promotion programs to attract visitor interest (W5-T1).

Based on the internal and external factors, the SWOT analysis is outlined as follows:

1. Strength-Opportunity (S-O) strategies utilized for developing sustainable agricultural agroedutourism by leveraging strengths and opportunities are as follows: (a) Utilizing natural resources in implementing sustainable agriculture to support the tourism prospects of Batulaya Village. (b) Land availability can bolster the expansion of sustainable agricultural practices. (c) Transportation access can bolster tourism prospects and address market needs. (d) Government and village community support facilitates the implementation of educational and cultural activities for the potential of agro-educational tourism. € Government and village community support enhance the implementation of sustainable agriculture. These strategies need implementation due to the critical role of managing human and natural resources in supporting the continuity of the sustainable agricultural agro-educational tourism program. The roles of the community and village government in land utilization are pivotal for realizing tourism prospects and enhancing educational and cultural capacities in Batulaya Village. According to Nuzil & Dayat (2020), physical resources require enhancement through the S-O strategy by effectively utilizing land to create a strategic advantage. The designated tourism area is too small, leading to customer complaints about limited and unattractive tourist areas. Addressing these shortcomings necessitates the involvement of human resources in managing the available natural resources in the region.
2. Weakness-Opportunity (W-O) strategies aim to minimize internal weaknesses, capitalize on external opportunities, and include strategies such as improving agricultural infrastructure to support sustainable agriculture, educational, and cultural activities. Conversely, there is a need to enhance farmers' knowledge and skills in marketing programs to reinforce the implementation of sustainable agriculture and boost tourism prospects. According to Suprayitno et al. (2018), farmers' capacity to optimize land use is pivotal in improving their quality of life through agrotourism management activities. In this context, capacity refers to identifying and utilizing opportunities and potential in farming business areas. Farmers in tourist areas can harness the opportunities the influx of tourists presents.
3. Strength-Threat (S-T) strategies involve leveraging internal strengths to address external threats, such as utilizing the potential of natural resources to heighten visitor interest, improving transportation access, and ensuring land availability to attract visitors, even in unpredictable climate conditions. According to Komalasari et al. (2023), local economic potential development is a collaborative process involving regional governments, community groups, and the private sector to generate jobs and stimulate the economy in a well-structured manner. Formulating strategic systems can take various forms, including new policies, training facilitation, collaborations, and physical and non-physical facilitations deemed beneficial for developing local economic potential.
4. Weakness-Threat (W-T) strategies minimize internal weaknesses and mitigate external threats. Strategies can be employed include optimizing the newly established village-owned enterprise to facilitate investor entry for investment costs and rural agro-educational facility development. According to Utama et al. (2022), optimizing Village-Owned Enterprises (BUMDES) is an effort in the development of rural agro-tourism that fosters partnerships between the community and Tour Operators to market and promote agro-tourism products, as well as between community institutions and relevant Tourism Departments and UPTs. Local economic development entails establishing regional institutions, such as BUMDES, enhancing human resource capacity to create superior products, expanding and seeking markets, enhancing knowledge and

technology, and supporting small industries and local-scale businesses (Polnaya and Darwanto, 2015).

3.2. Community Empowerment Program

The initial phase of the community empowerment program, based on the analysis of internal and external factors as well as the SWOT analysis, involves coordinating with the Batulaya Village government officials and partners, namely the youth organization, farmer group, and Family Welfare Movement group (PKK) of Batulaya Village. This coordination was conducted through focus group discussions (FGD) and public awareness sessions held in the Village Office's auditorium. The discussions revolve around the development of the "Farming for the Future: Agroedutourism-Based Community Assistance as a Model for Sustainable Agriculture" in Batulaya Village. The agreed-upon and implemented program components include: (a) Establishing Agroedutourism Systems: The agroedutourism system equips farmer groups within the village with the knowledge and skills necessary to enhance agricultural practices. This encompasses sustainable aquaponics, Black Soldier Fly (BSF) cultivation, and hydroponics. (b) Implementation of Sustainable Farming Practices: Sustainable farming practices, such as crop rotation, intercropping, and integrated pest management, are introduced to enhance soil health, reduce chemical use, and bolster crop resilience against climate variability. (c) Developing Community-Based Tourism Programs: The development of community-based tourism programs spotlighting the village's agricultural practices and products can increase farmer income and promote the village as a sustainable tourism destination. This introduces a new revenue source for the village and raises awareness about sustainable farming. (d) Improving Market Access: Improving market access through local market establishment or value chain development that connects farmers with buyers can boost farmer income and encourage the consumption of local products. (e) Empowering the Role of Youth Organizations in Agriculture: Youth organizations play a pivotal role in the sustainable agricultural development of the village. Providing them with training, resources, and necessary support can increase their involvement in agriculture and promote gender equality and youth empowerment.

Fig. 1. Overview of Technology Transfer in the Community Empowerment Program in Batulaya Village.

The first aspect of learning and training provided to the community is managing household organic waste in Batulaya Village using Black Soldier Fly (BSF). The Black Soldier Fly (BSF) is a beneficial insect transforming organic waste into high-quality organic fertilizer (Rehman et al., 2023). The process of creating organic fertilizer from BSF cultivation involves several stages: feeding BSF larvae with organic waste, harvesting mature larvae, and processing them into fertilizer. The proper technology is needed for organic waste processing to ensure the resulting products do not generate additional waste. The bioconversion technology utilizing BSF maggots can convert organic material with economic potential, as BSF maggots decompose organic waste faster than other insects. Additionally, products derived from organic waste processing by BSF maggots hold substantial economic value (Barrett et al., 2023). For instance, BSF maggots can serve as a protein source for animal feed, and the residual "kasgot" (maggot residue) can be used as an alternative substitute for government-provided NPK fertilizer.

The second aspect involves establishing hydroponic vegetable cultivation systems utilizing the fertilizer produced through the decomposition process by BSF. This community empowerment aims to enhance hydroponic cultivation and organic fertilizer utilization skills, knowledge, and productivity (Amaliyah, 2023). The targeted outcomes include (a) improved knowledge and skills, awareness, and motivation among target beneficiaries regarding utilizing vacant land or yards for food/self-sufficiency and alternative family income; (b) installation of simple hydroponic techniques and their maintenance for community use; and (c) the ability to produce organic fertilizer for plants, especially hydroponic and other conventional cultivation methods. Participatory methods are employed to actively engage beneficiaries in implementing hydroponic techniques and organic fertilizer production. Completed activities include introducing hydroponic installation methods and techniques, familiarizing with tools and materials, and understanding organic fertilizer production and application. This conducted community service program assists target beneficiaries in addressing challenges and enhancing their productivity (Renata et al., 2023).

The third aspect is the establishment of an aquaponic system. Aquaponics is an integrated system combining fish and vegetable cultivation, mutually benefiting each other. Fish cultivated in the system receive direct feed from the cultivators, while vegetables derive nutrients from fish waste and decomposed feed, aiding in plant protein synthesis. Fish feed includes processed Black Soldier Fly (BSF) maggots. Thus, these three systems support and sustain one another. A series of community service activities have been conducted, covering fish cultivation techniques in tarpaulin ponds using aquaponic systems and producing locally sourced fish feed and BSF maggots.

The knowledge innovations have been well received, even enhancing the knowledge and skills of beneficiaries [20, 21]. This increase in knowledge, skills, and motivation is anticipated to facilitate the continuity of these cultivation practices, positioning Batulaya Village as a model agroedutourism village for aquaponic fish cultivation techniques and pellet feed production in the future. Aquaponic fish cultivation is a novel practice for the Batulaya Village community, requiring time for implementation. Additionally, financial constraints were experienced in providing the necessary facilities for fish cultivation. Therefore, during activities, the team assisted in the form of tarpaulin ponds, catfish fingerlings, and pellet-making equipment to motivate local farmers. Subsequent activities focused on water quality management techniques for fish cultivation media, ensuring proper pond irrigation for optimal water quality and enhancing fish survival rates and growth. The Head of Batulaya Village has committed to this program by providing a Black Soldier Fly (BSF) cultivation facility at the Old Village Office measuring 8x10 meters. Furthermore, land measuring 8x20 meters and 6x10 meters has been allocated for hydroponic and aquaponic systems in the Batulaya Village Office compound.

Fig. 2. Socialization and Discussion on the Development of Agroedutourism in Batulaya Village.

Fig. 3. Training and Mentoring Activities with Beneficiaries/Partners in Batulaya Village

4. Conclusion and Recommendations

Based on the Community Service Program activities conducted in Batulaya Village, it is known that the strengths possessed include infrastructure, transportation access, natural resources, human resources, and land. The opportunities available include educational activities and cultural tourism in Batulaya Village. A suitable development strategy aligned with the agroedutourism development of Batulaya Village involves leveraging the natural resources and tourism potential to attract local people or tourists to visit. Awareness-raising, mentoring, and training have been conducted for hydroponic and aquaponic cultivation and managing household organic waste in Batulaya Village using Black Soldier Fly (BSF). An infrastructure for BSF has been established to generate maggots that can serve as fish feed in the aquaponic system and produce organic fertilizer for hydroponics. Thus, these three systems mutually support each other for sustainable agroedutourism in Batulaya Village.

Agroedutourism benefits the local community's economy by creating jobs and generating income for small-scale farmers and local businesses. Additionally, it can support preserving local culture and traditions by promoting sustainable farming practices and endorsing the use of local products. The village government is focused on developing appropriate and sustainable agricultural products, ensuring land management and investment allocation have a more precise

development direction. The feasibility of investment and the future development of agroedutourism can be maximized and made more purposeful.

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References

[1] Bwana, M. A., Olima, Andika, D, Agong, Stephen, G., Hayombe, P. 2015. Agritourism: Potenti al Socio-Economic Impacts in Kisumu County. *Journal of Humanities and Social Science*, 20(3):78-88.

[2] Akbar A, Burhanuddin, Ali A, Mustafa MY. 2022. PKM Peningkatan Mutu UMKM Pariwisata Ekonomi Kreatif melalui Program Short Course of Basic English for Marketing. *Prosiding Seminar Nasional Hasil Pengabdian*. Universitas Negeri Makassar.

[3] Salikin AK. 2003. *Sistem Pertanian Berkelanjutan*. Yogyakarta: Kanisius.

[4] Rival RS & Anugrah IS. 2011. Konsep dan Impelentasi Pembangunan Pertanian Berkelanjutan di Indonesia. *Forum Penelitian Agro Ekonomi*. Vol. 29 No.1.

[5] Budiarti T, Suwarto, & Muflikhati I. 2013. Pengembangan Agrowisata Berbasis Masyarakat pada Usahatani T erpadu guna Meningkatkan Kesejahteraan Petani dan Keberlanjutan Sistem Pertanian. *Jurnal Ilmu Pertanian Indonesia*, 18(3), pp 200–207.

[6] Pambudi SH, Sunarto, Setyono P. 2018. Agrotourism Development Strategy in Supporting Agriculture Development - Case Study Desa Wisata Kaligono (Dewi Kano) of Kaligesing District of Purworejo Regency. *Analisis Kebijakan Pertanian* 16 (2) pp. 165-184.

[7] Supriadi, R. .2021. Pengembangan Agroeduwisata Kebun Buah Kelengkeng (Dimocarpus Longan) Bumdes Graha Mandala Sebagai Model Pemberdayaan Masyarakat (Studi Kasus di Desa Borobudur, Kecamatan Borobudur, Kabupaten Magelang) (Doctoral dissertation, Politeknik Pembangunan Pertanian Yogyakarta).

[8] Rangkuti F. 2015. *Analisis SWOT: Teknik Membedah Kasus Bisnis Cara Perhitungan Bobot, Rating, dan OCAI*. Jakarta: Penebit PT.Gramedia Pustaka Utama.

[9] Yunas, N. S. 2023. The Pentahelix Model in the Development of Agro-Culture-Based Edutourism in the TNBTS Buffer Village Area (Study in Tosari Village, Kabupaten Pasuruan and Sapikerep Village, Kabupaten Probolinggo). *Sodality: Jurnal Sosiologi Pedesaan*, 11(1), 76-86.

[10] Nawawi, N., Dafrita, I. E., Trisianawati, E., Sari, M., Herditiya, H., & Manisa, T. 2023. Pelatihan Pemanfaatan Hidroponik Atraktif bagi PKK Desa Wajok Hilir Kabupaten Mempawah. Bubungan Tinggi: *Jurnal Pengabdian Masyarakat*, 5(1), 514-521.

[11] Nuzil, N. R., & Dayat, M. 2020. Pengembangan Kawasan Agroeduwisata Berbasis Potensi Unggulan Desa (Studi kasus di Desa Wisata Kalipucang Kecamatan Tutur Kabupaten Pasuruan). *Media Trend*, *15*(1), 157-173.

[12] Suprayitno, M. A. A., Fatchiya, A., & Harijati, S. 2018. Kapasitas Petani Pengelola Agrowisata di Kabupaten Malang, Jawa Timur. *Jurnal Penyuluhan*, *14*(2).

[13] Komalasari, N. D., Susiantoro, A., & Puspaningtyas, A. 2023. Strategi Bumdes dalam Optimali sasi Ekonomi Desa Melalui Pengelolaan Agrowisata D'ganjaran Kecamatan Taman Kabupate n Sidoarjo. *PRAJA observer: jurnal penelitian administrasi publik (e-ISSN: 2797-0469)*, *3*(01), 118-129.

[14] Utama, Y. H. C., Mamuaya, C. L., & Poerwanti, S. D. 2022. Optimalisasi Badan Usaha Milik Desa (BUMDES) Sebagai Upaya Pengembangan Desa Agrowisata di Kabupaten Sidoarjo. *BERDAYA: Jurnal Pengabdian kepada Masyarakat*, 1(1), 38-45.

[15] Polnaya, G. A., & Darwanto, D. 2015. *Strategi Pengembangan Ekonomi Lokal untuk Meningka tkan Daya Saing Pada Ukm Ekonomi Kreatif Batik Bakaran di Pati, Jawa Tengah* (Doctoral dis sertation, Fakultas Ekonomika dan Bisnis).

[16] Rehman, K. U., Hollah, C., Wiesotzki, K., Rehman, R. U., Rehman, A. U., Zhang, J., & Aganovic, K. 2023. Black soldier fly, Hermetia illucens as a potential innovative and environmentally friendly tool for organic waste management: A mini-review. *Waste Management & Research*, 41(1), 81-97.

[17] Barrett, M., Chia, S. Y., Fischer, B., & Tomberlin, J. K. 2023. Welfare considerations for farming black soldier flies, Hermetia illucens (Diptera: Stratiomyidae): a model for the insects as food and feed industry. *Journal of Insects as Food and Feed*, *9*(2), 119-148.

[18] Amaliyah, L. S. 2023. Pelatihan Budidaya Sayuran Hidroponik sebagai Upaya Mengembangk an Usahatani Terpadu dan Berkelanjutan di Desa Sindagsari Kecamata Petir Kabupaten Sera ng. *Jurnal Abdi Masyarakat Indonesia*, *3*(3), 859-868.

[19] Renata, E. A., Alhamdany, S. N. A., & Tondang, I. S. 2023. Pemberdayaan Masyarakat Melalui Hidroponik Sederhana Bagi Masyarakat Rungkut Kidul Kota Surabaya. *Jurnal Pelayanan dan Pengabdian Masyarakat Indonesia*, *2*(3), 45-50.

[20] David, J., & Rosanto, S. 2023. Analisa Penerapan Community Based Tourism Pada Desa Wisata: Kampung Wisata Kreatif Cigadung, Jawa Barat. *Jurnal Fusion*, *3*(08), 809-823.

[21] Kurniasanti, S. A. 2019. Analisis Strategi Pengembangan Agrowisata. *Journal of Tourism and Creativity*, 3(1). 65-76.