

Study of Herbal Agro-Tourism as an Environmental Conservation Effort in Seberaya Village, Karo District, Indonesia

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Abstract

Seberaya village has a high biodiversity potential in flora, especially in herbal plants. The aim of this research is to identify the potential of herbal agrotourism as an environmental conservation measure to achieve sustainable development in the region. Descriptive qualitative method with observation and interview data collection. Data analysis techniques using the Miles and Huberman model. The results showed that there is potential for agritourism such as physical conditions, socio-economic conditions of the community and herbal plant commodities that support in Seberaya village. Visitors can enjoy cool, clean and beautiful natural panoramas, conduct tourism recreation with edufarming activities, namely the introduction of herbal plants, cultivation practices and herbal medicine processing. Herbal agritourism can contribute to environmental conservation by promoting organic practices, sustainable agriculture and raising awareness of the importance of conserving natural resources and biodiversity. With the existence of agritourism in Seberaya Village, it can promote local products, combat depopulation, protect nature in these areas, reduce the use of chemicals, meet the demand for healthy food, improve wildlife habitat, support local communities and encourage ethical choices, in line with the circular economy for a greener future

Keywords: Agritourism; Herbal plants; Nature conservation; Seberaya village



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INTRODUCTION

Indonesia is a tropical country with a potential biodiversity of 4,444 species of flora and fauna, bringing many benefits and impacts to both the country and the surrounding community (Kurniasanti, 2019). The "back to nature" lifestyle encourages people to travel to areas that are still intact and rich in potentially valuable resources (Suwarsito et al., 2022). It cannot be denied that Indonesia's natural resources are very important for improving the economy and development in Indonesia, such as

vegetables, fruits and spices, which are also commonly referred to as herbal plants (Suhartawan, 2022). Herbs, also known as medicinal plants, refer to plants that have been used for centuries for their medicinal, nutritional and therapeutic properties (Soundararajan, 2020). These plants contain a variety of phytochemicals that contribute to their pharmacological effects, making them a valuable source of traditional and modern medicine (Shaheen et al., 2019). Plants are rich in bioactive compounds such as polyphenols, carotenoids and flavonoids, which have antioxidant, anti-inflammatory, antimicrobial and immunomodulatory properties (Tumpa & Islam, 2019). They have been used to prevent and treat various human ailments, demonstrating their potential as natural remedies for health conditions. The use of herbs is not limited to medicinal purposes, but also extends to food, flavouring and spiritual practices, highlighting their diverse applications and significance in different cultures and societies (Matole et al., 2021).

Agritourism is an activity of the conservation movement that combines travel and tourism with aspects of agricultural activities. Tourist attraction based on Joint Decree No. 47/PW.DOW/MPPT-89 and No. 204/KPTS.HK/050/04/Year 1989 between the Minister of Tourism, Point of Sale and Telecommunications and the Minister of Agriculture. Agritourism as part of it is defined as a form of activity that uses agriculture as a tourist attraction with the aim of expanding knowledge, recreational experience and business relationships in agriculture (Lumbanraja & Lumbanraja, 2023). By developing agrotourism, we can emphasise local culture in land use, increase farmers' income, protect land resources and preserve local culture and technology (Akrob, 2023).

Herbal agritourism plays an important role in environmental conservation by promoting sustainable practices that benefit ecosystems and local communities. Integrating herbal tourism with agrotourism can promote the cultivation and conservation of medicinal plants, leading to the preservation of indigenous knowledge and biodiversity (Leco et al., 2013). Agritourism, particularly in the form of agroforestry, provides a strategic approach to establishing medicinal and aromatic plants in agricultural landscapes, securing the livelihoods of indigenous communities while conserving medicinal and aromatic plants (Jan & Abbas, 2018). In addition, the implementation of environmental management strategies in agri-tourism enterprises can further contribute to conservation efforts by overcoming barriers and maximising benefits in areas rich in natural resources, such as *Castilla y Leon* in Spain (Scherrer et al., 2023). Overall, the integration of herbal agrotourism not only supports sustainable development, but also contributes to the protection and sustainable use of medicinal plant resources, which ultimately promotes environmental conservation and community welfare (Türke et al., 2013).

Research has been conducted on the use of herbs for environmental conservation in various contexts. Studies have highlighted the importance of traditional medicinal plants in preserving local knowledge and sustainable resource management (Scherrer et al., 2023). Research has also focused on assessing the biodiversity of herbaceous species in areas under ecological pressure, with particular emphasis on the conservation status of certain plants such as *Rauwolfia serpentina* (Palla, 2022). Research has also explored the use of plant extracts, particularly from the Asteraceae and Lamiaceae families, to combat microbial colonisation of cultural

heritage artefacts, demonstrating the antimicrobial properties of these natural products (Luszczki et al., 2019). In addition, efforts have been made to replace chemical wood preservatives with herbal extracts such as *Acorus calamus*, which have demonstrated their potential to fix chromium in wood samples and offer a more environmentally friendly preservation alternative (Dhiman et al., 2020).

Seberaya village in Karo regency, North Sumatra has the potential to be developed into herbal agro-tourism. Currently, encroachment of conservation forests in Karo regency has been carried out by many residents. If this forest encroachment is not anticipated, it will not only damage the ecosystem of the area but will also reduce the aesthetic and cultural value for future agritourism development. Therefore, the purpose of this study is to analyse the potential of agritourism as an environmental conservation measure to achieve sustainable development in Seberaya village, Karo regency, North Sumatra.

METHOD

The research location was carried out in Seberaya village, Karo regency, North Sumatra based on the area has the potential for herbal plant agro-tourism which can later be developed as a tourist destination. The data observed in this study are the physical condition of the area namely altitude (relief), regional boundaries, forests and agricultural crops, the socio-economic conditions of the community, most of whom are herbal plant farmers and the herbal plant products produced by farmers. This research is a type of qualitative research that provides a clear picture of agro-tourism as an effort to conserve the environment.

Data collection techniques in this study were (a) observation through field visits to find out the condition of the physical and biological environment and the socio-cultural environment of the local community, and (b) interviews conducted to obtain information from the community around the research site. Data analysis is deductive, using interactive analysis in the form of (a) data collection, this stage involves collecting all the data relevant to the research or analysis. Data can come from a variety of sources, such as surveys, interviews, observations, documentation, and others; (b) reduction aims to simplify and organise the data collected to make it easier to understand and analyze. Techniques often used at this stage are data coding, selection of relevant data, grouping of data and data abstraction; and (c) verification, it is at this stage that the researcher interprets the data that has been presented and attempts to infer findings or patterns from the data (Miles et al., 2014).

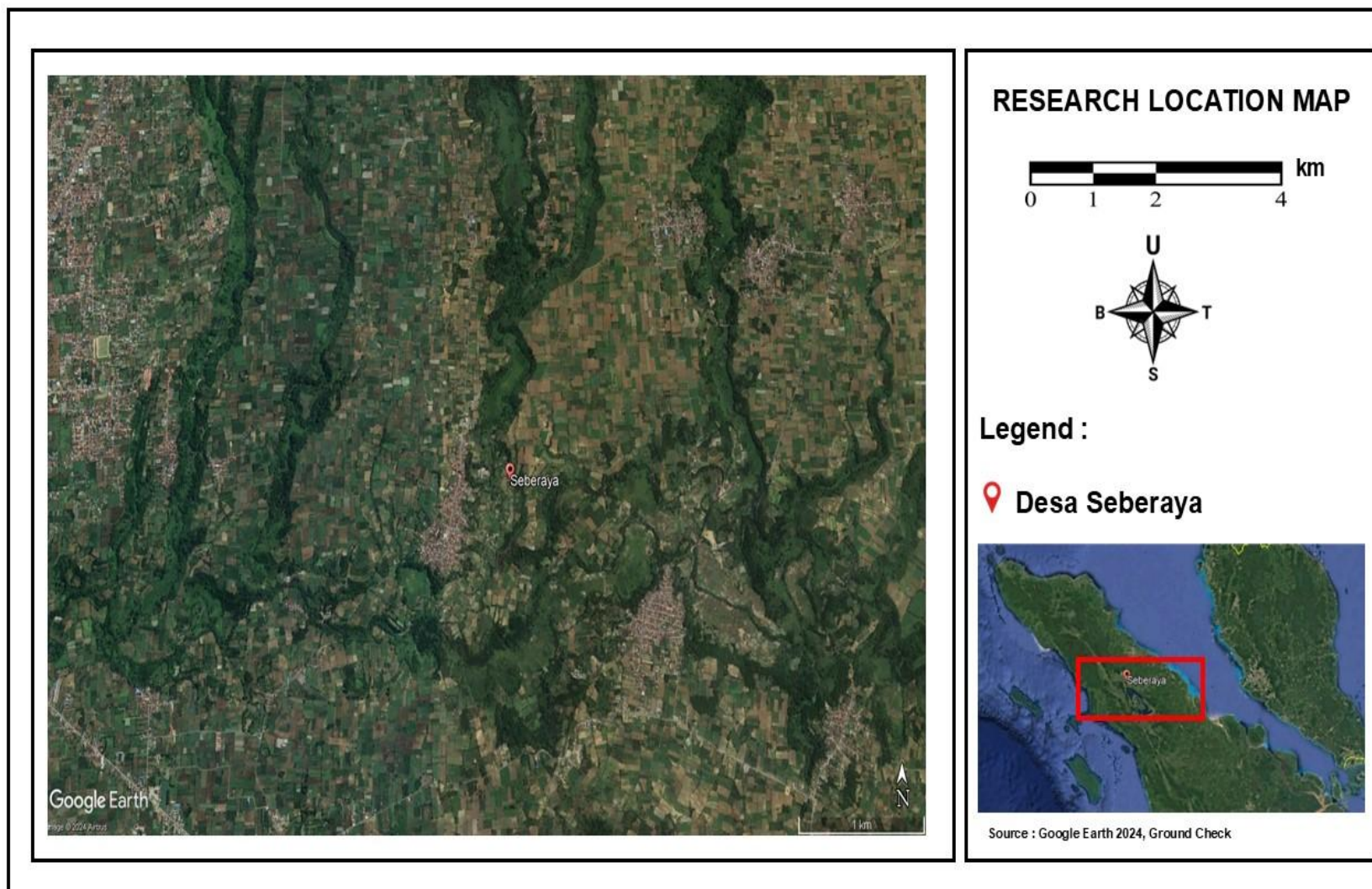


Figure 1. Map of the location of Seberaya Village

RESULTS

Seberaya Village Physical Condition

Seberaya is one of the villages in Tiga Panah sub-district, Karo regency, located about 85 km from Medan Polonia airport and 8 km from the regency. Geographically, Seberaya is bordered by the villages of Kutabale, Ajimbelang, Bertah, Lepar Samura and Kutajulu. The topographical location of the land is flat and slightly hilly, with most of the land used by the community as agricultural land, so most of the people in Seberaya are farmers.

The Seberaya village area is located on the Sukanulu road and is in Kubucolia village with site boundaries, namely: North bounded by Ajimbelang village; South bounded by Kuta Bale and Tiga Panah villages. To the west it is bounded by the village of Lepar Samura, and to the east by the villages of Kubucolia and Sukanalu. Agricultural land is 1.117 Ha, residential land is 45 Ha and forest land is 30 Ha. The great potential of agriculture, forest (nature) and culture in this village can be a creative potential for this management in the future. In terms of topography, the land conditions of Seberaya village are mostly flat areas, valleys and a few hills with an altitude from sea level of 1200 - 1300 m. And the average rainfall is 1,000 mm to 1,400 mm/year. The average temperature is 17 °C to 24 °C, with this situation, the community uses the land mostly as agricultural land as a community livelihood.

The demographic aspect is that the residents who have introduced Seberaya village are surnamed Depari. One of the famous figures such as composer Djaga Depari, along with the development of times in this village, based on data from the [BPS-Statistics Indonesia \(2023\)](#), the population is increasing even until 2023 it is estimated that the population will be approximately 3,270 with details of 1,607 men and 1,663 women with a population density of 163.50 people/km. In this village there are 45 people who work as civil servants, 661 head of household (a.k.a hh) are farmers and 661 hh are entrepreneurs: 661 hh and 56 hh entrepreneurs. In this area there are also 6 churches, 1 mosque, 2 primary schools, 1 community health centre and 3 medical centres.

Community Socio-Economic Situation

The community of Seberaya village is a pluralistic society consisting of various tribes, religions and customs, but despite this, Karo customs are still maintained until now. The background is based on an event in the 1980s. In that year, 10 traditional leaders were elected throughout Karo regency. The economic existence of the Seberaya community can be categorised by the tribal development that occurred in this village. In terms of economic development (when compared to other villages within the sub-district), Seberaya is one of the richest villages in Tiga Panah subregency, but no matter how rich Seberaya is, there is still a group of people who are less well-off.

Herbal Plant Commodities

Karo regency is well known as a producer of agricultural products such as fruits and vegetables, which is quite a lot both in terms of capacity and types of fruits and vegetables. Data on the area of fruit and vegetable crops in Seberaya village, which have potential as agro-tourism herbal crops, are shown in Table 1.

Table 1. Types of herbal plants in the village of Seberaya

No	Herbal Plants	Species Name
1	Vanila	<i>Vanilia planifolia</i>
2.	Cloves	<i>Syzygium aromaticum</i>
3.	Cinnamon	<i>Cinnamomum verum</i>
4.	Orange	<i>Citrus aurantiifolia</i>
5.	Tobacco	<i>Nicotiana tabacum</i>
6.	Passion fruit	<i>Passiflora edulis</i>
7.	Coconut	<i>Cocos nucifera</i>
8.	Candlenut	<i>Aleurites moluccanus</i>
9.	Pineapple	<i>Ananas comosus</i>
10.	Asparagus	<i>Asparagus officinalis</i>
11.	Aren tillapia	<i>Arenga pinnala</i>
12.	Cabbage	<i>Brassica oleracea</i>
13.	Rice	<i>Oryza sativa</i>
14.	Corn	<i>Zea mays</i>

DISCUSSION

The Potential for Herbal Agro-Tourism in the Village of Seberaya

Herbal agro-tourism has been developed with the aim of being an environmentally friendly educational tourism park, and can be used as a processing and development of herbal medicines to increase people's love for the preservation of herbal plants. In Seberaya village, there are 14 species of herbal plants that can be used as agro-tourism. Herbal agrotourism in Seberaya village has an attraction, namely objects that can be seen in the form of various herbal gardens and edufarming activities, namely the introduction of herbal plants, cultivation practices and herbal medicine processing. Several other types of natural potential in Seberaya village include rice fields, gardens and water that flows throughout the year.

The potential for herbal agritourism in Indonesia is significant, as various regions of the country have rich resources that can be developed into attractive tourist destinations. Study in Bali (Utama et al., 2022), Malang regency (Putra et al., 2023), Banyuwangi (Hakim et al., 2016), dan Bandung regency (Kartika & Edison, 2021) highlights the diverse opportunities for developing agri-tourism based on herbs and spices. The region has identified many species of herbs and spices with unique values that can be used to create tourism products ranging from agrotourism to culinary and wellness experiences. In addition, research on agrotourism in Gunungsari Kopeng (Naibaho & Nuswantara, 2023) emphasised the importance of marketing strategies in attracting tourists to agritourism sites and showed a correlation between marketing mix elements and visitor interest in return visits. Overall, Indonesia's agrotourism potential is promising, offering a blend of natural beauty, cultural experiences and agricultural richness for tourists to explore.



Figure 2. Core zone for agro-tourism with herbal plants

Herbal Agrotourism As A Conservation Measure

Karo regency is known for its natural resource potential. Seberaya village is one of the villages in Karo regency where the majority of the people work as farmers. With the existing herbal plants, this village will be used as a natural agrotourism area. [Mikhailova et al., \(2023\)](#) explained that nature agritourism is a form of tourism that integrates agricultural activities with the exploration of natural resources in rural areas, with the aim of increasing the income of local people while promoting sustainable practices and cultural exchange.



Figure 3. Community Nucleus Plantation Zone (*Source Photocad application*)

Herbal agritourism can contribute to environmental conservation by promoting organic practices, sustainable agriculture and raising awareness of the importance of conserving natural resources and biodiversity. Agritourism in Seberaya village can promote local products, combat depopulation, protect nature in these areas, reduce the use of chemicals, meet the demand for healthy food, improve wildlife habitat, support local communities and encourage ethical choices, in line with the circular economy for a greener future (Figure 3).

Herbal agritourism promotes environmental conservation by preserving natural resources, This form of agritourism integrates herbal cultivation, traditional practices, and eco-tourism activities, contributing to the maintenance of the rural environment (Ciolac et al., 2022). By combining agriculture and tourism, herbal agritourism adds value to agribusinesses while preserving local ecosystems and promoting rural development (Pakalla & Ghozali, 2022). Studies show that agrotourism initiatives, such as Tanjung Sakti Agrotourism, can have a positive impact on environmental conservation by using natural resources wisely and encouraging community involvement in conservation efforts (Utami & Shomedran, 2023). In addition, the cultural and social aspects of agritourism, as seen in villages like Kandri, play an important role in preserving local traditions and raising environmental awareness among visitors (Sriyanto et al., 2019). Overall, herbal agrotourism represents a holistic approach to sustainable development. It benefits local communities and the environment (Shen et al., 2020).

CONCLUSION

Seberaya village has the potential for agro-tourism because it has physical conditions in the form of natural panoramas that are still cool, clean and beautiful, and there are many herbal plants that will be able to provide edufarming for tourist visitors. With the existence of agritourism in Seberaya village, it can promote local products, combat depopulation, protect nature in these areas, reduce the use of chemicals, meet the demand for healthy food, improve wildlife habitat, support local communities and encourage ethical choices, in line with the circular economy for a greener future.

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Conflict of interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Author contributions

All authors contributed to the study's conception and design. Material preparation, data collection and analysis were performed by all authors. The first draft of the manuscript was submitted by [Theodora Ginting Munthe]. All authors contributed on previous version and revisions process of the manuscript. All authors read and approved the final manuscript.