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Herbal and Coffee Plant Agrotourism Development Model in Karo Regency, North Sumatra of Indonesia

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The goal of this study is to examine potential development strategies for herbal plant agrotourism in Seberaya Village, Karo Regency. This study uses a qualitative descriptive method. The population includes managers, farmer groups, communities, and government stakeholders, with a sample of 80 people selected by purposive sampling. We collected data through observation, focus group discussions (FGD), interviews, and questionnaires. Data analysis used the SWOT, IFAS, and EFAS analysis methods. The development of herbal plant agrotourism involves several key programs, such as environmental conservation, enhancing aesthetic value and natural beauty, and boosting recreational value. This program also aims to establish agrotourism as a hub for scientific activities and generate economic benefits for the community and region. The SWOT analysis reveals that this agrotourism falls into quadrant I (SO strategy), characterized by average internal factors and moderate external factors. The regional tourism development plan has the potential to incorporate this agrotourism as a new attraction. The QSP matrix results indicate that focusing on herbal plant cultivation and transparently managing agrotourism with community and farmer groups is the best strategy. The proposed cooperation model is participatory management, where the government acts as a motivator and facilitator, the private sector manages and develops agrotourism, and farmers and communities are involved in cultivation and tourism. Fostered farmer groups will train and assist farmers to ensure effective management. We propose a participatory management model for the development of herbal agrotourism in Seberaya Village, which involves farmers and the community in the development process and the formation of farmer groups. Each stakeholder will play a specific role in the development of this agrotourism.

Keywords: Agrotourism, herbal plants, farmers, regional development, tourism.

INTRODUCTION

Indonesia is an agricultural country with great potential for tourism development because of its abundant natural resources and biodiversity. When properly managed, the abundance of natural resources can boost economic growth (Budihardjo, 2017). It is undeniable that natural resources in Indonesia play an important role in increasing the economy and development, such as vegetables, fruits, and spices. Indigenous people generally use spices from Indonesia in three ways: as preservatives, food flavorings, and traditional medicines. Interestingly, this spice plant has been known since ancient times as a native Indonesian commodity with a high selling value (David, 2022).

The current era has led to the widespread processing of these spices into medicinal ingredients, which are in high demand for maintaining endurance, treating various diseases, preventing allergies, and treating other ailments. Indonesian spices are widely sought after by foreign countries around the world. Our country's unique soil enables the growth of a wide variety of plants and spices across Indonesia (Lo *et al.*, 2020). Herbal plants, in general, are plants that are well-known and closely associated with their use in maintaining vitality, healthy growth, and healing various diseases. The use of herbal plants as medicinal plants has developed, especially in eastern societies. The eastern world's contribution to the use of natural materials to maintain health and cure diseases is known to be very rich. In addition to the abundance of natural resources, the knowledge of eastern medicinal plants, which is richer than that of European societies, is also supported by aspects of knowledge and rich local wisdom (Hidayat and Tannady, 2023a).

Empirical experience in the use of various herbs in the art of eastern medicine has attracted the attention of western society

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to study herbal plants further as a source of future medicines. Exploration of the potential of herbs as medicinal plants is currently further strengthening the important role of herbs in modern medicine. Reports now indicate that various herbal plants offer health benefits and serve as significant medicinal plants (Kakamoukas *et al.,* 2021). The demand for herbal products has increased every year, especially since the beginning of the COVID-19 pandemic in 2020. The demand for herbal products has spiked along with increasing public awareness of the importance of increasing body immunity. Due to the trend of increasing endurance and self-medication, of course herbal medicinal plants are one of the alternatives chosen (Budiasa and Ambarawati, 2023).

PT. Varia Sekata (Varse) is one of the pharmaceutical companies in Indonesia that has received good manufacturing practice certification since 1995. It also processes herbal medicines in addition to chemical medicines. Especially since the pandemic, the demand for herbal products has continued to increase. However, the raw materials for herbal products that are derived from herbal plants still require supplies from other sources, as they have not yet been planted independently (Pranskuniene *et al.,* 2022; Samad *et al.*, 2021). This leads to uncompetitive product prices and delays in obtaining limited raw materials.

In Indonesia, places to plant or cultivate herbal plants are still rare. In fact, Indonesia is rich in various medicinal plants for health and beauty. This makes the use of herbal plants less than optimal. Tropical land and climate are very supportive of the procurement of planting areas. Various herbal plants have existed for thousands of years in Indonesia but are not optimal in their production and distribution activities (Utama *et al.,* 2022). This is due to a desire to use agricultural land to produce daily staple crops such as rice, corn, cassava, tobacco, oil palm, sago, and others. Fruit and vegetable plants also still dominate agricultural land. In addition, many agricultural sectors are currently combined with the concept of agrotourism, which offers natural beauty as well as processing locations where visitors can see the production process. However, agrotourism that incorporates the concept of herbal plants is still relatively rare. Agrotourism can also utilize the cultivation of herbal plants to provide raw materials for company production (Hidayat and Tannady, 2023b).

Since the prolonged monetary crisis has driven up the price of medicines, people have begun to look at traditional medicines, which are in fact no less efficacious than modern medicines and much cheaper (Chen and Diao, 2020). Many people who have recovered from traditional medicines have developed a desire to learn more about medicinal plants, including their physical form, cultivation methods, efficacy, and proper use. This is where herbal plant agrotourism has emerged as a viable alternative form of tourism for enthusiasts of herbal plants (Toria *et al.,* 2021).

There has been limited prior research on the development of herbal plant agrotourism. Previous researcher had analyzed the strategy of developing traditional medicine agrotourism and conducted a SWOT analysis to identify four potential strategies to improve agrotourism performance. These strategies include optimizing agrotourism's benefits and management, as well as maintaining high and effective product quality (Zaman *et al.,* 2022). Furthermore, the study highlighted the importance of adapting to the shift in consumer tourism preferences, which is increasingly shifting from mass tourism to environmentally friendly tourism. By understanding and adapting to these changes, the development of herbal plant agrotourism can become more relevant and attractive to consumers who prioritize sustainability and a more natural tourism experience (Sumantra, 2017).

In the management and planning of environmental systems, one of the main requirements in environmental system management and planning is the ability to estimate simple and complex conditions that may occur in the future (Andry *et al.,* 2023). Creating a model for managing agrotourism in a specific area can help identify needs. This modeling process will identify fundamental aspects such as data collection and environmental management requirements. We hope that the creation of a management model will enable various stakeholders to comprehend the integration of agrotourism with the core plasma pattern in a forest area (Rauniyar *et al.,* 2021).

This study aims to develop a model for the development of herbal plant agrotourism in Karo Regency, North Sumatra, based on the community's integrated farming and a People's Core Pattern partnership pattern, with the goal of enhancing the welfare of both farmers and the community. Partnership mechanism was implemented to gauge the degree to which we can achieve these goals. The company invites the community to cooperate in cultivating herbal plants by making a joint agreement with the community and forming a group of farmers who are willing to cooperate with the company. The success of a partnership pattern depends on its implementation. The key to partnership is a process that involves increasing the intensity of core and plasma relationships based on real and measurable trust between each other. Partnerships must have a commitment that satisfies both parties and fosters interdependence (Mishra *et al.,* 2023). The mechanism, rights and obligations, and effectiveness of cooperation by both parties serve as the benchmark for the success of a partnership. Partnerships must have a commitment between partners (both parties) and foster interdependence (Nurpriyatin *et al.,* 2020). The mechanism of a partnership pattern and the obstacles encountered during its implementation set the benchmark for its success. Factors that need to be considered to ensure that partnerships or cooperation between the two parties are successful include excellent communication.

MATERIALS AND METHODS

This study employs a qualitative descriptive method to elucidate the development of Seberaya Village Herbal Agrotourism as a popular tourist destination, with significant potential benefits for farmers, managers, the community, and the government. Through this approach, the study focuses on an in-depth assessment of various aspects that influence agrotourism's success and development. This study's population includes managers, company management, farmer groups, the community, and government stakeholders involved in the development of Seberaya Village Herbal Agrotourism. A sample is a part of a population that is selected based on certain characteristics that are considered representative. In this study, we selected 80 samples, not all members of the population, to streamline the observation and data analysis process.

The sampling technique used is non-probability sampling, where not all members of the population have the same opportunity to be selected as samples. Purposive sampling, a technique in this category, selects samples based on specific considerations relevant to the research objectives. We obtained research data through observation, focus group discussions (FGD), interviews, and questionnaires. We process the data using inductive techniques, aiming to draw conclusions from the collected data. We use a qualitative descriptive method for data analysis, employing a SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis approach. In this analysis, we measure internal and external factors using a Likert scale questionnaire, and then analyze them using IFAS (Internal Factor Analysis Summary) and EFAS (External Factor Analysis Summary).

RESULTS AND DISCUSSION

Integrated programs that prioritize environmental sustainability, community welfare, and local economic contribution can foster the development of herbal agrotourism (Rana *et al.,* 2024). With this holistic approach, herbal agrotourism can become a tourist destination that is not only aesthetically attractive but also functions as a center for environmental conservation and scientific development. One potential program is environmental conservation. This program aims to maintain and preserve the natural environment around the herbal agrotourism area. Replanting lost native trees, controlling soil erosion, and implementing sustainable water management are examples of conservation measures. In addition, it is important to provide environmental education to visitors and local communities to raise awareness of the importance of nature conservation (Rana *et al.,* 2024; Widayati *et al.,* 2024). By implementing environmentally friendly and sustainable agricultural practices, we can set an example for other areas in terms of responsible environmental management.

Furthermore, the development of aesthetic value and natural beauty is an important step in making it an attractive agrotourism destination. We can achieve this by designing a beautiful and harmonious landscape, which includes arranging an attractive herbal garden, building comfortable pedestrian paths, and providing facilities that allow visitors to fully enjoy the natural scenery. The development of supporting facilities such as rest areas, photo spots, and recreation areas designed in harmony with the environment will add to the visual appeal of this agrotourism. To increase tourist appeal, the development of high recreational value is also a focus. Various recreational facilities can enhance the visitor's tourism experience through the integration of herbal agrotourism. For instance, educational pathways can provide visitors with knowledge about various types of herbal plants and their benefits, while camping and trekking areas allow visitors to engage directly with nature. Facilities for family activities, such as children's playgrounds and picnic areas, can also add to the recreational value of this agrotourism. Herbal agrotourism also has the potential to become a center for scientific activities and science development. Creating a research center or laboratory that focuses on herbal plants can attract the interest of researchers, academics, and students to conduct field studies. Holding seminars, workshops, and training on herbal plants and their use in traditional and modern medicine can also make this agrotourism a place for superior scientific development (Widayati *et al.,* 2024).

Finally, we anticipate that this development program will generate economic benefits for the community and boost the original income in the region. By empowering local communities to act as tour guides, homestay managers, and producers and sellers of herbal products, agrotourism can create new jobs and increase community income, which discussed by Rambodagedara *et al.* (2015). The increase in the number of tourist visits will also have an impact on increasing regional income through taxes and levies. Thus, this agrotourism is not only a new source of income for the community, but it also supports the overall economic growth of the region. With the implementation of these programs, herbal plant agrotourism can develop into a comprehensive and sustainable tourist destination. These programs not only benefit the parties involved, but they also contribute positively to nature conservation and scientific development.

The SWOT analysis results place agrotourism management in quadrant I, suggesting effective implementation of the Strengths-Opportunities (SO) strategy. This suggests that herbal agrotourism has significant internal strengths and can take advantage of existing external opportunities for further development. This agrotourism management has a positive value based on internal factors, which reflect strengths in management, resources, and existing tourism potential. However, this value is in average condition, indicating that although there is great potential, there is still room for improvement and enhancement. In terms of external factors,

the analysis shows that herbal agrotourism is in a moderate condition. This suggests that the external environment, which encompasses market opportunities, government support, and tourism trends, presents significant opportunities, but also presents challenges that require resolution. These challenges may be caused by competition with other tourist destinations, changes in tourism trends, or economic fluctuations that can affect the number of tourist visits.

The SO strategy resulting from this analysis recommends that managers utilize existing internal strengths, such as the uniqueness of herbal plants, educational and research potential, and local community support, to capture existing external opportunities (Helms and Nixon, 2010). Expanding tourism programs, enhancing promotion, and collaborating with the government and private sector can enhance the attractiveness and accessibility of agrotourism. With a position in quadrant I, agrotourism managers can focus on sustainable and innovative development by maximizing existing strengths and proactively addressing external challenges. This allows agrotourism to develop into a leading tourist destination that is not only attractive but also provides economic and social benefits to the local community.

People view agrotourism management as a new model in tourism management, with the potential to become a major attraction in the area. By integrating aspects of environmental conservation, education, and local economic empowerment, we can propose agrotourism as a leading tourist destination in the regional tourism development master plan strategy. This will not only increase tourism destinations, but also strengthen Indonesia's position as a center for herbal agrotourism. This strategy will more evenly distribute business opportunities for farmers and the local community. Good agrotourism management will create various economic opportunities, ranging from selling herbal products and tour guide services to managing tourist facilities such as homestays and local restaurants. Thus, local communities will gain significant economic benefits, which in turn will improve their welfare. This strategy also contributes to the welfare of many people by increasing access to education and information about herbal plants, as well as promoting environmentally friendly, sustainable agricultural practices. Furthermore, this agrotourism can serve as a platform for introducing and marketing local products to a wider market, both nationally and internationally. In other words, developing agrotourism is not only about creating new tourist destinations but also about creating a broad positive impact on society and the environment.

The results of the quantitative strategic planning matrix (QSPM) calculation show that the strategy with the highest attractiveness value is building tourism through the development of herbal plant cultivation. We chose this strategy due to its significant potential to yield sustainable benefits for the village, particularly when we actively involve the community and farmer groups in its management. The development of herbal plant cultivation not only functions as a tourist attraction but also as a new source of income for the local community (Tao and Wall, 2009). This strategy, with the direct involvement of the community and farmer groups, will ensure participatory and transparent tourism management. The open and honest atmosphere in this management allows all parties involved to have access to actual and relevant information so that they can contribute effectively to village development.

In addition, the openness of information will strengthen the sense of ownership and shared responsibility among the community and farmer groups for the success of this agrotourism. Access to information about developments and challenges at any time empowers the community to be more proactive in providing input and seeking innovative solutions. We anticipate that this will foster the growth of sustainable agrotourism, enabling the local community to directly reap the rewards of each action. This strategy can help it develop into a superior tourist destination with a strong identity as a center for herbal plant cultivation. A collaborative approach involving local communities will not only improve economic welfare but also strengthen social ties and pride in the village's cultural and natural heritage.

The proposed cooperation model for agrotourism development uses a participatory management approach where farmers and local communities are actively involved in every stage of development (Rambodagedara *et al.,* 2015). This approach not only strives to optimize the potential of agrotourism, but also guarantees that the local community directly experiences the economic and social advantages of this development. The formation of farmer groups, which serve as a forum for farmers to share knowledge, experiences, and best practices in herbal plant cultivation, will strengthen farmer participation in agrotourism management. The farmer group will also play an important role in organizing development activities, such as training, counseling, and collective land management. With this model, every member of the community has an equal opportunity to contribute to and benefit from the development of agrotourism. Furthermore, participatory management fosters transparency and accountability in agrotourism management by involving all stakeholders in collective decision-making. We anticipate that this approach will foster a shared sense of ownership, thereby enhancing the sustainability and success of the agrotourism program.

Agrotourism development involves various stakeholders with specific roles and functions to ensure the project's success and sustainability. The local government plays a role in providing regulations, infrastructure, and promotion, while the local community, especially farmers, is responsible for the management and operation of agrotourism. The farmer group is the primary driver of herbal plant cultivation and maintenance, as well as ensuring sustainable agricultural practices. The company, as the manager of agrotourism,

regulates the daily operations and marketing of the destination, while academics and researchers contribute through the research and development of scientific knowledge related to herbal plants. Tourists, as the primary consumers, provide valuable feedback for further development. With clearly defined roles, each stakeholder contributes to the success and optimal welfare of this herbal agrotourism (Rambodagedara *et al.*, 2015).

The government serves as a motivator and facilitator for the development of agrotourism. They provide the regulations, policies, and administrative support needed to support this initiative. In addition, the government also functions as a facilitator that coordinates various aspects of development, including the provision of basic infrastructure such as roads and public facilities. With this role, the government ensures that agrotourism development is in accordance with regulations and can provide optimal benefits for the local community. On the other hand, the private sector plays a role in managing and developing herbal agrotourism. They are responsible for daily management, tourism program development, and destination marketing. The private sector plays an important role in ensuring that the tourism experience offered is of high quality and in accordance with industry standards. With their expertise and resources, they can maximize the potential of agrotourism and attract both domestic and foreign visitors.

Meanwhile, farmers and local communities play a key role in the development of herbal plant cultivation and tourism. They are directly involved in various aspects, including plant cultivation, land maintenance, and providing services to tourists, such as tour guides and homestays. Their active involvement ensures the development of this agrotourism, rooted in local wisdom, and provides direct economic benefits to the villagers. Farmers' and local communities' participation is also important in ensuring the sustainability and long-term success of agrotourism. They help maintain the quality of products and services by being directly involved, ensuring that the development of agrotourism is in line with the needs and interests of the local community. This not only improves the tourist experience but also strengthens the local economy and builds a solid foundation for the future of agrotourism.

Fostered farmer groups will guide and assist farmers in the management of agrotourism development. These farmer groups serve as a forum for farmers to get the training, support, and guidance they need in herbal plant cultivation and agrotourism management. This guidance includes training in effective and environmentally friendly cultivation techniques, as well as sustainable land management. Furthermore, farmer groups will receive assistance with product management, including packaging and marketing of herbal plant products. This assistance aims to improve farmers' skills and knowledge so that they can contribute optimally to agrotourism development. The assisted farmer groups also play a role in facilitating communication and coordination between farmers and related parties, such as local governments and the private sector. With farmer groups, farmers not only receive technical support but also have the opportunity to share experiences, ideas, and solutions to challenges faced in developing agrotourism. This helps ensure that herbal agrotourism projects run smoothly and provide maximum benefits for all parties involved.

Seberaya Village's herbal plant agrotourism is the first in Karo Regency, North Sumatra, and is community-based with an integrated farming business model using the partnership pattern. This model integrates local farmers in every aspect of agrotourism development, from herbal plant cultivation to operational management and marketing. This pattern facilitates partnerships between the core (private sector or managers) and the people (farmers or local communities) with the aim of building mutually beneficial synergies. It allows local farmers to play an active role in the development and management of agrotourism while gaining direct economic benefits from their efforts. The core party provides facilities, training, and technical support, while local farmers provide valuable local labor and knowledge. By being the first herbal agrotourism project to implement this model, this project not only introduces the concept of innovative community-based agrotourism, but also provides a concrete example of how integration between various stakeholders can produce sustainable economic and social benefits. We expect this initiative to serve as a model for the development of similar agrotourism in other regions, thereby enhancing the welfare of local communities and bolstering the regional economy.

Seberaya Village's herbal plant agrotourism is not only the first in Karo Regency, but it also offers uniqueness and significant potential as an agricultural tourism object. Previously, agrotourism in this area focused more on fruit, flower, and vegetable plants. With the presence of herbal plant agrotourism, this area introduces a new type of agrotourism that has never existed before, providing a different and intriguing tourism experience for visitors. Herbal agrotourism's uniqueness lies in its focus on herbal plants that have health and medicinal benefits. This will certainly attract visitors who are interested in a healthy lifestyle and traditional medicine. By offering knowledge and experience about herbal plants, this agrotourism can attract visitors who are looking for alternative health and natural therapies, making it an intriguing and innovative tourist destination.

In addition, the potential for developing herbal agrotourism is enormous because it involves educational aspects about herbal plants, their practical use in everyday life, and opportunities for the development of herbal-based products (Widayati *et al.*, 2024). By adding herbal agrotourism to the agricultural tourism options, it will not only increase the diversification of tourist destinations but also provide new opportunities for local economic development. It can attract visitors from various backgrounds who are looking for a

unique and beneficial experience, as well as raise awareness of the value and benefits of herbal plants.

***Conclusion*:** We can implement various initiatives to foster the growth of herbal plant agrotourism in Seberaya Village, Karo Regency. These initiatives include environmental conservation programs, enhancing the aesthetic and natural beauty of the agrotourism area, elevating the recreational value of herbal agrotourism, establishing herbal agrotourism as a hub for scientific research and development, and generating economic benefits for both the community and the region. The SWOT analysis's results place the agrotourism management in quadrant I, specifically the SO strategy, indicating a positive internal factor value under average conditions, and a moderate external factor classification. Furthermore, the tourism management model views the management of this agrotourism as a new attraction, and it can be proposed as a regional tourist destination in the tourism development master plan strategy. This strategy will create equitable business opportunities for farmers and local communities, thereby enhancing the welfare of a large number of people. The results of the QSP matrix calculation, which involves multiplying the weight of each factor by the value of the attractiveness produced, indicate that the selected alternative strategy, strategy 1 (one), produces the highest total value of attractiveness. This strategy involves building tourism through the development of herbal plant cultivation. This strategy is managed in collaboration with the community and farmer groups, fostering an open and honest environment where those involved can obtain accurate information at any time. We propose a participatory management model for the development of herbal agrotourism in Seberaya Village, which involves farmers and the community in the development process and the formation of farmer groups. Each stakeholder will play a specific role in the development of this agrotourism. The government serves as a motivator and facilitator, while the private sector manages and develops agrotourism, and farmers and the community actively participate in the development of herbal plant cultivation and tourism. Farmer groups guide and assist farmers in managing the development of agrotourism.

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