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Sabang Agrotourism Area based on Essential Plants: Strategic Efforts in Improving Community Welfare

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ABSTRACT

The article explores the development of the Sabang Agrotourism Area, strategically focused on essential plants such as patchouli, cloves, and nutmeg, to enhance community welfare. Sabang City, situated in the westernmost region of Indonesia, is part of the National Tourism Strategic Area with abundant natural resources. The agricultural sector, covering 19.23% of the total area, has not fully tapped into the potential of agrotourism. The absence of agrotourism in Sabang City prompted a collaborative effort between Syiah Kuala University, Atsiri Research Center (ARC), and the Sabang Free Trade Zone and Free Port Concession Agency (BPKS). The community service approach utilized community-based learning and the Quadruple Helix model, involving academics, government, business, and the community. Through Focus Group Discussions (FGD), the team addressed short-term goals by discussing agrotourism potential and long-term goals of community empowerment. The findings reveal the extensive essential crop plantations in Sabang City, particularly patchouli, and cloves. Sabang's patchouli exhibits superior quality, with the highest yield value, making it an excellent candidate for export. Cloves, besides their economic value, serve as effective antioxidants and eco-friendly pesticides. The proposed Sabang Agrotourism Area includes five zones: Reception, Agro-tourism, Thematic Park, Family Garden, and Accommodation. Each zone caters to different activities, ensuring a holistic agrotourism experience. This community service contributes valuable insights and potential breakthroughs to policymakers, agrotourism developers, farmer groups, academics, and the broader community. The comprehensive analysis of Sabang's essential natural resources underscores the region's potential as a leading agrotourism destination. The proposed Agrotourism Area serves as a strategic step towards sustainable development, augmenting community income and well-being.

Keywords: Sabang, Agrotourism, Essential Plants, Community Welfare

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INTRODUCTION

Sabang City is one of the archipelago areas in Aceh Province located at the westernmost tip of Indonesia and has been known by many tourists as a tourist destination (Inhil &; Downstream, 2019). In the government regulation of the Republic of Indonesia number 50 of 2011, Sabang City is included in the National Tourism Strategic Area (KSPN), and has many natural resources, ranging from natural tourism, cultural tourism, and historical tourism (Furqan &; Muniruddin, 2021). Sabang City is one of the regions in Indonesia that has a strategic position as a tourist destination that can be combined with the education sector and agro activities, especially essential-based crops such as patchouli, cloves, and nutmeg that have the potential to be developed in this area (Inhil &; Downstream, 2019). Given its strategic position, a strategy is needed to develop the tourism sector. Development in the tourism sector is one of the goals of the Sabang City government in its efforts to increase revenue (Yusra et al., 2023).

The agricultural business sector in Sabang City plays an important role, among others, in meeting the food needs of Sabang City, absorbing labor, and increasing farmers' income. Although Sabang City is dominated by trade and service activities, some city residents also make a living in agricultural business. The agricultural area in Sabang City is identified as 2,942 ha or about 19.23% of the total area of Pulau Weh, Sabang (Inhil &; Downstream, 2019). What has never been developed in Sabang City is agrotourism. This agrotourism is included in the type of rural tourism that can increase the income of local farmers and provide opportunities for villagers to contribute to maintaining resources (Susila et al., 2024). Tourism that makes agriculture in the countryside an attraction can attract tourists because rural areas have great potential to become agrotourism objects (Technica, 2016). This can increase income and provide an alternative for youth to be able to work in their villages (Juniarta, 2019).

Because the concept of agrotourism has not been implemented in Sabang City, it is necessary to discuss the development of agrotourism areas to increase the number of visitors. Therefore, the team proposed the development of agrotourism areas so that agrotourism can run well and have competitiveness. With the collaboration between lecturers from various majors at Syiah Kuala University, Atsiri Research Center, Syiah Kuala University, and the Sabang Free Trade Zone and Free Port Concession Agency (BPKS), marks a potential breakthrough that can improve the tourism sector. Analysis of the University's situation will give you a deep understanding of Sabang Agro-Tourism. For example, it was found that Sabang has a very large amount of Essential Natural Resources. The latest data and facts will provide a clear picture of the potential that exists and opportunities that may still need to be fully explored.

The beneficiaries of this paper are policymakers at various levels of government in Sabang City; implementers and developers of agrotourism programs in Sabang City; farmer groups (Poktan) and farmer groups (Gapoktan) as well as rural communities in the area where agroeducation programs are implemented; academics in the implementation and assistance of agroeducation program development in Sabang City; and the wider community in the implementation and development of agroeducation programs in Sabang City. Developing a tourist area by creating public facilities that can provide attraction for visitors (tourists), where visitors will also be involved in carrying out various agricultural activities and production processes, accommodate growing economic opportunities from the local community through the development of agrotourism areas and improve environmental quality in the area to be developed.

METHOD

The method of implementing this service activity is carried out at Sabang Port with the Free Trade Zone and Free Port Concession Agency (BPKS), involving Cross-Department Lecturers from Syiah Kuala University, Politeknik Indonesia Venezuela, and Atsiri Research Center on March 6-9, 2024. The methods used by the team in this community service are Community-based learning and Quadruple Helix. Community-based learning has elements of change and renewal, which have parties outside the community who function to encourage renewal, namely the government and the private sector. The second is society or the community itself (Noorrizki et al., 2023). Community-based Learning focuses on community needs and is a derivation of the concept of development centered on human resources. The concept of Helix is based on the idea that innovation is an interactive result involving various types of actors. Each actor contributes according to their institutional function in society. University (U), Industry (I), and Government (P) are included in the Triple Helix. Furthermore, the farmer empowerment program through the Quadruple Helix approach by involving academics, government, business people, and the community can increase the human development index (Soesilowati et al., 2020).

This service program is carried out using FGD (Focus Group Discussion) techniques. The use of this method is to achieve short-term goals in discussing the potential of agrotourism and improving the welfare of the community around tourist destinations which is then expected to influence the long-term goal of community empowerment. The series of activities carried out through FGD are by the disciplinary actions of each service. In the chemical engineering aspect, the service team provided material related to the potential of natural resources obtained from Essences in the form of Patchouli, Cloves, and Nutmeg in Sabang and how the potential produced from the content of Patchouli, Cloves, and Nutmeg. Furthermore, in the architectural aspect, the service team provided knowledge material on good governance and interior design along with input on Sabang Port. In the Business Aspect, the service team provided material about the market potential obtained from the production of Patchouli, Cloves, and Nutmeg as well as how the community can also benefit from agro-tourism. So it is hoped that a series of activities through FGD can produce new ideas for Sabang Agrotourism.

RESULTS AND DISCUSSION

Agrotourism potential has high economic value by using the concept of community empowerment based on people's economy in Sabang City (Kurniawati et al., 2018). To obtain learning materials for the development of Agro-tourism areas, the team and partners received assistance from BPKS. This community service activity began with a discussion held by BPKS with Syiah Kuala University. Activities that have been carried out by the team and partners in carrying out agrotourism community service are helping and providing information about good, interesting, and sustainable agrotourism management. These activities can be seen as follows:

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Figure 1. Field Analysis of Patchouli and Clove Area
Source: Personal Documentation

Agriculture and Field Atsiri Farming

Agricultural business fields in Sabang City play an important role, including in meeting the food needs of Sabang City, absorbing labor, and increasing farmers' income. Although Sabang City is more dominated by trade and service activities, some city residents also make a living in agricultural businesses. The agricultural area in Sabang City was identified as covering an area of 2,942 ha or about 19.23% of the total area of Weh Island, Sabang. This area consists of a moor/garden covering an area of 1,555 ha, fields covering an area of 1,179 ha, and the rest in the form of uncultivated land of 209 ha (BPS Kota Sabang, 2019).

The profile of the area of essential crop plantations, namely patchouli, cloves, nutmeg, and candlenut in Sabang City by sub-district is shown in Table 1, while Table 2 shows the amount of annual production.

Table 1. Area of Essential Plantations (ha) Sabang City

District	*Patchouli*		*Clove*	
	2017	2018	2017	2018
Sukajaya	0	3	1.434	1.584
Sukakarya	0	4	1.132	1.182

Source: BPS Sabang, 2019

Table 2. Essential Production (ton) of Sabang City

District	*Patchouli*		*Clove*	
	2017	*2018*	*2017*	*2018*
Sukajaya	0	*0,1*	*250,9*	*287,8*
Sukakarya	0	*0,3*	*162,4*	*199,3*

Source: BPS Sabang, 2019

Although the profile of patchouli oil production is still relatively small, this potential can be developed into a superior product considering the availability of a large area for patchouli cultivation in Sabang City and the very high patchouli content from Aceh to reach 34% (Rahmawati et al., 2021). If this potential opportunity is developed and associated with the tourism potential (agro-tourism) of Sabang City, it will create a multiplier effect that can be obtained by the community. Such as the creation of new jobs, and increasing the income of farmers who do not only rely on one commodity, which ultimately creates a prosperous society and a maintained environment.

Aceh Patchouli is a recommended export standard patchouli because it has a distinctive aroma and high yield of dried leaf oil, which is 2.5% to 5% compared to other types of patchouli. Aceh Patchouli was first known and widely planted in almost all regions of Aceh. Aceh patchouli has better quality and economic value compared to others. Aceh patchouli has a characteristic distinctive aroma and a high yield of dry leaf oil, which is 2.5% to 5%. In addition, the high patchouli alcohol content above 30% makes this commodity a prima donna for the market share of the world essential oil industry. Specifically, patchouli plants can be distinguished by the type of leaves that are visually visible. Aceh Patchouli has a smooth, toothed, and slightly blunt leaf surface but the tip of the leaf is slightly pointed. Javanese patchouli has a rough leaf surface texture, the edges of the leaves are pointedly serrated and the shape of the leaf tips is tapered. In terms of survival, Javanese Patchouli plants are more immune to bacterial wilt and nematode attacks because of their higher phenol content compared to other types (Inhil &; Hilir, 2019).

As for cloves, they can produce oil. Clove essential oil can be useful for inhibition against spoilage microorganisms of medium moisture food (Gülçin et al., 2012). In addition, clove oil can be used as a green pesticide. In 1998, clove oil as a pesticide was registered under the United States Environmental Protection Agency (USEPA) (Shahavi et al., 2019).

Land Suitability in Sabang

Land suitability is the suitability of land for a particular use, for example, land for irrigation, ponds, annual crop farming, or seasonal crop farming. More specifically,

the suitability of the land is seen from the physical properties of its environment, which consists of climate, soil, topography, hydrology, and drainage that are suitable for farming or certain productive commodities. The area of land available for the development of the Bino Park &; Garden Agro-Eduwisata area, Sabang City is around 35 ha located in Sukajaya District with a distance of about 20km from Sabang City which can be accessed by motorized vehicles. Currently, the location of the area to be developed is dominated by unproductive shrubs and mango plantations. The area is rather hilly and near the beach. The average height of the site to be developed is about 28 meters above sea level. Geologically, almost the entire land of Sabang City is in the form of rocks, both in the form of volcanic rocks and alluvial rocks (Inhil &; Hilir, 2019). A map of land conditions on Weh Sabang Island is shown in Figure 2.

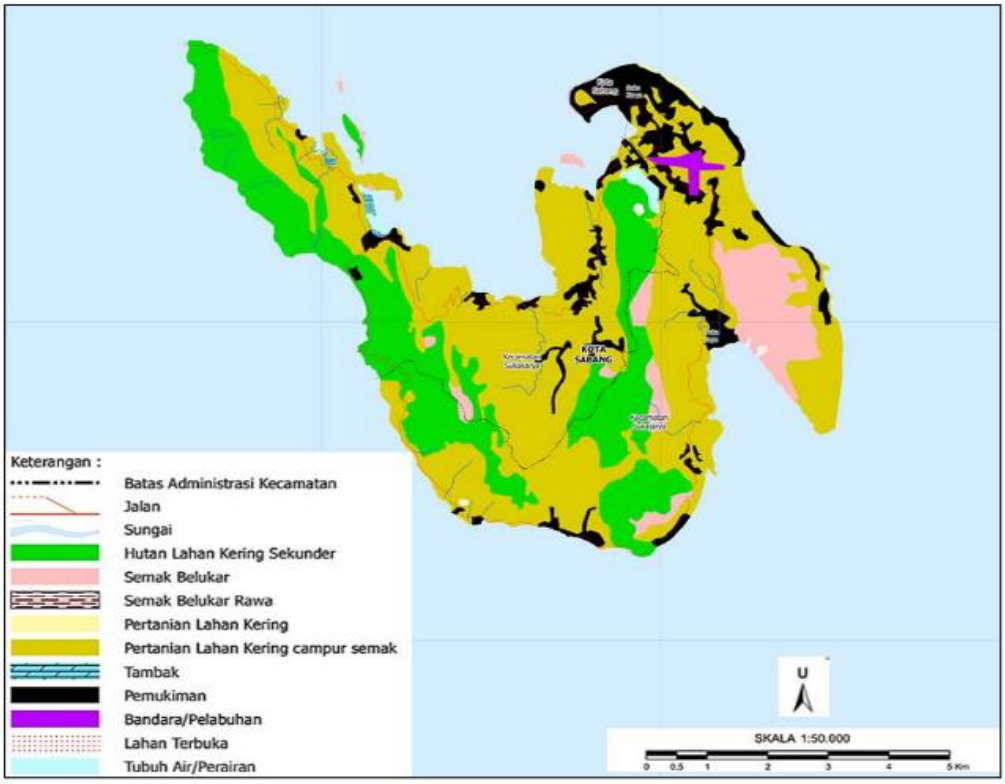

Figure 2. Map of Land Conditions in Pulau Weh, Sabang

The Quality of Essential Plants

Sabang Patchouli products have the largest yield value (4.2%) compared to patchouli originating from Aceh Jaya (2.3%), South Aceh (2.3%), or Aceh Besar (2.1%). The concentration of PA Patchouli Sabang obtained was 27.50%. This value is not significantly different from patchouli from Aceh Jaya (27.77%). Other patchouli patches have PA values between 33.31% to 34.30%. However, when calculating the amount of PA produced per kg of dry weight of patchouli leaf samples, then Sabang Patchouli has the largest value (11.85 grams PA/kg of dry matter). This value is about 2x greater than patchouli products originating from Aceh Jaya (Inhil &; Hilir, 2019).

From these results, it can be concluded that Sabang Patchouli has the best quality and has great potential to be developed.

The World Health Organization (WHO) Expert Committee on Food Additives has set the acceptable daily human intake of clove oil at 2.5 mg/kg body weight for humans. This level of clove oil consumption can reduce many health risks. Clove oil was found to be an effective antioxidant in various in vitro assays including reduced power, DPPH ABTS radical and scavenging superoxide anion radicals, hydrogen peroxide scavenging, and metal chelating activity when compared to standard antioxidant compounds such as a-BHA, BHT, tocopherol, natural antioxidants, and Trolox which are water-soluble tocopherol analogs. Clove oil can be used to minimize or prevent lipid oxidation in food and pharmaceutical products, slow the formation of toxic oxidation products, maintain nutritional quality, and extend the shelf life of food and medicine (Gülçin et al., 2012).

Clove oil is classified as a minimum-risk pesticide and is not subject to federal registration requirements because its active and inert ingredients are perfectly safe for human use. Furthermore, eugenol, as the active ingredient of clove oil is a broad-spectrum insecticide (EcoPCOÒ D) sold by EcoSMART Technolo- gies (Alpharetta, GA, USA)(Shahavi et al., 2019).

Agro-tourism activities

Tourism activities that will be implemented in the Agrotourism Area, Sabang City are divided based on tourist participation in agricultural activities (upstream and downstream), namely active activities and passive activities. Active activities are activities that involve tourists in agricultural activities (upstream and downstream) directly.

Figure 3. Patchouli Agro Area Potential

In terms of garden tourism, visitors are introduced to various types of fruit plants and other gardens, especially patchouli gardens. Visitors are given knowledge about plant cultivation, eating and drinking processed fruits, and souvenirs from plant-based materials in the agrotourism edu area (Swastika et al., 2017). In detail, visitors conducting garden tours can actively learn how to process raw materials into a product by packaging the product in safe, clean, and beautiful packaging (Djuwendah et al., 2021). One example of active activity in this tourist area is inviting tourists to actively participate in the farming process, from land preparation to harvesting (for example, preparing patchouli land, patchouli cuttings, planting patchouli, making

compost from solid waste distilled patchouli, distilling patchouli oil, or making patchouli-based perfume).

The concept of Agrotourism Area Space aims to plan a tourist area in Sabang that contains recreational value and at the same time educational value. The existence of this edu-agro tourism area is expected to become a new tourism icon in Sabang.

The Sabang City Agrotourism Area is divided into five zones in which there are various activities. The zones are divided into specific groups and placed according to the activities within them.

1. Reception Zone
   This zone has a main gate with a distinctive design and a parking area that can accommodate four-wheeled, and two-wheeled vehicles and buses. The receiving area is a plaza equipped with gardens and sculptures as an attraction. In this zone, there is also a main building that functions as a ticketing area, information center, gallery, food court, souvenir shop, and mobile train shelter that can be an alternative for visitors who want to go around the area. This reception zone becomes the first impression when visitors enter the Agrotourism Area. The gates and reception buildings are designed with local accents that characterize the area.
2. Agro-tourism Zone
   This zone contains plantation areas, namely patchouli gardens, coconut groves, various types of mangoes, and various types of fruit plants typical of Aceh. In the patchouli agro zone, there are patchouli cultivation gardens, other essential plant sample gardens, and patchouli processing areas (drying areas, distilleries, patchouli education areas, laboratories, and greenhouse nurseries). In this zone, visitors can do patchouli agrotourism (learn about the cultivation of patchouli plants and other essential plants, learn and try the process of making products from patchouli as well as, shop for patchouli and other essential products).
3. Thematic Park Zone
   Coco Garden is a zone in the area that exists as a coconut plantation (cocos nucifera). In this zone, it is planned to add several landscape elements such as a collection garden of various coconut species, paths, hammocks, gazebos, stop points, and theme cafes.
4. Family Garden Zone
   This Zone is a recreation area for families with several attractions such as mini farms, picnic areas, mazes, water recreation arenas, viewing towers, playgrounds, and stages. Some elements of the park support zones such as trails, seating, and stop points.
5. Accommodation Zone
   The Accommodation Zone provides facilities related to accommodation that can be rented out to the public. The planned facilities provided include cottages, rental buildings, function rooms, and outdoor wedding spaces.
6. Support Zone
   The Supporting Zone includes nursery areas, warehouses, storage warehouses, landscape maintenance equipment, waste treatment areas, generators, and water storage units.

The existence of agro-tourism activities must be able to ensure environmental sustainability, especially those related to renewable and non-renewable biological resources to ensure the improvement of community welfare in the region. The identification of the factors below will determine the sustainability of Sabang City Agro-tourism activities (Inhil & Hilir, 2019).

1) Use resources continuously
2) Reduce waste production
3) Safeguarding biodiversity
4) Integrate agro-education activities into planning
5) Supporting the local economy
6) Engaging local communities
7) Consultation with stakeholders and the public
8) Training
9) Marketing of agro-educational objects
10) Research
11) Agro-Tourism management institutions

CONCLUSION

This community service illustrates the efforts to develop the Agro-tourism Area in Sabang City as a strategy to improve community welfare through the cultivation of essential-based crops such as patchouli, cloves, and nutmeg. Sabang City, as part of the National Tourism Strategic Area (KSPN), has abundant natural potential, including natural, cultural, and historical tourism. Although the agricultural sector in Sabang City has not been fully utilized, especially in the form of agrotourism, this article details the development measures, the potential of natural resources, and the economic benefits that can be generated. By involving various parties such as lecturers from various departments, the Atsiri Research Center, and the Sabang Free Trade Zone and Free Port Concession Agency (BPKS), potential synergies are created to improve the tourism sector. Through Community-based learning and Quadruple Helix methods, this article contributes to policymakers, agrotourism program implementers, farmer groups, academics, and the general public. The findings of the University's situation analysis of Essential Natural Resources in Sabang provide an in-depth picture of the potential of the region. The development of the Agrotourism Area in Sabang City by involving FGD techniques and cross-department collaboration produces new thoughts and insights that can support the success of agrotourism in the region. Analysis of land suitability, essential quality, and economic potential of crops such as patchouli and cloves shows that Sabang has great potential to become a leading agrotourism destination. This article stimulates thinking on how Agrotourism Areas can be an attraction for tourists while providing economic benefits and well-being to local communities as a strategic step towards sustainable development and increased community income.

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