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Coconut Harvesting Habitus and Community Plantation Production on Simeuelue Island

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Abstract. The people of Simeulue Island, Aceh, have a long-standing tradition of coconut gardening. Before the 2004 earthquake and tsunami, coconut production in this area was quite high. However, in recent years, the decline in coconut production has threatened the supply of raw materials for the local processing industry. As a result, hundreds of tons of raw materials must be imported from Nias Island to meet the needs of the industry. One of the main causes of this decline is suboptimal harvesting practices. This study revealed that most coconut varieties cultivated in Simeulue are Kelapa Dalam, which has a productive age of 10 and 30 years. Based on visitation patterns, there are two types of coconut gardens: those that are regularly visited and those that are rarely visited. The rarely visited gardens are only visited during harvest time, about once every three months. The vegetation in these gardens tends to be denser, but their productivity is difficult to control. Most of the productive coconuts currently come from low-quality seeds, namely small coconuts that are not harvested because they are considered uneconomical. These seeds are often less than 1 kg; some are as big as 250 ml mineral water bottles. Efforts are needed to ensure the sustainability of the coconut industry in Simeulue; efforts are needed to provide superior seeds that can improve the quality and quantity of future harvests.

Keywords: Coconut Plantation Revitalization, Cultivation, Harvesting Practices, High-quality seed

1 Introduction

In every society, natural resources (SDA) and the environment play an important role in shaping and realizing its culture [1], including in shaping social, economic, and environmental interactions [2]. This shows that the culture of a society includes not only social and economic aspects but is also closely related to how society interacts with the surrounding environment. In the context of Simeulue Island, the local community's culture is intrinsically related to coconuts, including inheriting knowledge and skills related to the use of coconuts, which shape their cultural and economic identity [3]. Coconuts are not only food but also construction materials, craft materials, and the main source of income for residents [4].

Simeulue Island is one of the areas with a high demand for coconuts as one of the main sources of income for its people. The need for coconuts is balanced with the production capacity of coconut plantations spread throughout the island. However, the problem is the relationship between coconut needs and coconut harvesting practices on Simeulue Island. Harvesting coconuts on land outside the main island is an important factor contributing to coconut production on Simeulue Island. In this context, coconut harvesting practices that account for 60-70% of the island's total coconut production have significantly impacted natural coconut vegetation. Over the past few decades, this coconut harvesting practice has affected the growth and quality of natural seedlings in community coconut plantations. The sustainability of coconut harvesting practices affects the local economy. It reflects the community's commitment to preserving the natural environment [5], which also indicates how the people on this island protect and respect their natural environment [6]. However, changes in coconut harvesting practices over time can significantly impact the sustainability of coconut plantations [5] on Simeulue Island.

People living on islands often have a special relationship with their natural environment, which includes natural resources (SDA) such as coconuts [7]. As one of the abundant natural resources on many tropical islands, coconut has become the heart of the island people's lives. Skills and knowledge in utilizing coconuts have been

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passed down from generation to generation, forming the cultural and economic identity of the community. The local community on this island has developed a lot of knowledge and skills in managing coconut plantations and harvesting their crops (BPS Simeulue 2019). However, over time, changes in coconut harvesting practices can significantly impact the sustainability of the productivity of smallholder coconut plantations on Simeulue Island [8].

Geological events like earthquakes and tsunamis also influence the relationship between Simeulue Island and its natural environment. For example, the existence of an island in the epicenter area has been shown to affect the geological dynamics and environment of the island [9], which can significantly impact natural resource management, including cultural practices such as planting coconuts on an island. These impacts can be direct or indirect. Earthquakes and tsunamis can cause physical damage to farmland, including coconut plantations. Tsunamis, in particular, can carry salt-containing seawater to land, causing soil salinization. This salinization can damage soil fertility and affect the growth of coconuts, which are sensitive to high salt levels [10] [11]. In addition, natural disasters also impacted changing resource management patterns, where they switched from planting coconuts to plants that were more resistant to degraded soil conditions. The Dahdouh-Guebas study shows that after the 2004 tsunami, some communities in Southeast Asia switched to other food crops that produced faster and could help economic recovery [12], where this can erode the culture of coconut cultivation that has long been part of the community's identity. On the other hand, governments and international organizations are often involved in post-disaster recovery efforts. Land rehabilitation and sustainable agriculture training programs are sometimes not based on cultural patterns that have been embedded for a long time, so they can shift coconut cultivation practices that are part of the past heritage of the Simeulue people.

Several factors affect the productivity of coconut products on Simeulue Island. In the context of coconut production outside the main island, interesting events need to be the focus of attention. Data shows that about 60-70% of coconut production comes from areas outside the main island. The harvest pattern used in this area is the wholesale harvest pattern, where harvested coconuts are stacked before being peeled and sorted. This harvest pattern, historically, has emerged at least after the 2000s, especially after the coconut industry became dominant. This pattern emerged in response to the practice of life based on the most logical choices. "stunting" coconuts with low economic value are usually not peeled and left alone. Uniquely, this previously neglected "afkir / rejected" coconut grows into coconut seedlings.

It is important to understand that coconut cultivation habits involve a whole series of processes, from seed provision to harvest time. It covers all aspects that affect the sustainability of community coconut plantations on Simeulue Island. In this study, we will further explore the concept of coconut cultivation habitus, from the initial stage of seed provision to the final stage of harvesting.

The habitus theory is a theoretical framework that explains how social and cultural structures shape the behavior of individuals and groups. Habitus is defined as a set of dispositions (tendencies, attitudes, and behavior patterns) internalized by individuals through their life experiences in a specific social context [13]. Habitus guides individual actions, perceptions, and evaluations without conscious thinking. Bourdieu emphasized that material, historical, and social conditions shape habitus but can also reproduce and transform those structures through everyday practice [14].

In dissecting the habitus of coconut harvesting cultural practices, Bourdieu's habitus theory can be operationalized by analyzing how social, cultural, and economic structures shape coconut harvesting practices and how these practices reproduce or change those structures. The habitus of harvesting coconuts can be identified through internalized dispositions by farmers, such as how they choose the harvest time, tree climbing techniques, or traditional tools. This disposition is often influenced by local knowledge passed down from generation to generation. Habitus emphasizes the importance of capital in shaping social practices. In the context of coconut harvesting, economic capital (such as land ownership), cultural capital (knowledge of harvesting techniques), and social capital (community networks) influence how harvesting practices are carried out. Habitus is not static; It can change over time due to external pressures such as climate change, globalization, or policy interventions.

Examining the habits of coconut harvesting practices in the community is important because they are not only related to economic aspects but also involve social, cultural, and ecological dimensions. As a concept introduced by Pierre Bourdieu, Habitus refers to patterns of behavior, values, and practices embedded in people's daily lives. In the context of coconut harvesting, this habitus reflects the complex interaction between humans, the environment, and local knowledge systems. Studying the habitus of coconut harvesting practices in the community is important because it provides in-depth insights into ecological sustainability, socio-cultural value, innovation, food security, and response to global challenges. This study enriches academic understanding and provides a basis for developing sustainable and inclusive policies and practices.

Traditional coconut harvesting practices are often based on local knowledge that has stood the test of time and adapted to local environmental conditions. A study of coconut harvesting habits could reveal how these practices support ecological sustainability [15]. By understanding these habits, we can identify practices that can be adopted for more sustainable resource management. In addition, the coconut harvesting business is related to economic

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activities and has deep social and cultural values. The habitus of coconut harvesting reflects social relationships, hierarchies, and cultural values embedded in society. This study is important to understand how these practices strengthen social cohesion and cultural identity.

The study of coconut harvest cultural activities also allows us to identify opportunities to develop innovation and adaptation in the face of modern challenges such as climate change and globalization [16]. Coconut, which is also an important commodity that contributes to food security and the community's economy, especially in rural and coastal areas, can help optimize practices that support productivity and economic well-being. A deep understanding of traditional harvesting practices can help design policies that support smallholder farmers and improve food security [17]. Conducting a study of the habitus of coconut harvesting practices in the community is very important because it can provide deep insight into the interaction between culture, economy, and the environment in agriculture. The practice of coconut harvesting, as one of the main activities in the coconut industry, not only impacts production output but also affects the welfare of the people involved in the process.

2 Method

This article is written based on the results of ongoing research in 2023. This study uses an ethnographic approach with a live-in method. Researchers stay with the researched community for two months to deeply understand the community's culture, social practices, and daily life through participatory observation and direct interaction [18] [19]. This method allows researchers to obtain rich and authentic data as they experience firsthand the social and cultural context being studied. Ethnographic techniques prioritize a deep and contextual understanding of the subject being studied. This approach is important for capturing the nuances of social interaction and cultural practices within a given community [20].

In implementing the research, the researcher first prepares and permits the community to be researched. Researchers prepare themselves theoretically and practically before going live. This includes understanding the relevant literature, designing research questions, and obtaining permission from the community to be researched. In this case, it includes ethical clearance to ensure that research is conducted with respect for the rights and privacy of participants. The researcher stayed on Simeulue Island for two months and actively participated in various activities of the research subject's community, such as attending social events.

In collecting data, the researcher observes participation, where the researcher observes and records the community's behavior, interaction, and cultural practices. This observation is carried out systematically and continuously. Researchers also conducted informal interviews with community members to uncover the meaning behind their actions and practices. The data collected includes field notes, audio or video recordings, and relevant documents. The researcher critically reflected on his position as an "insider" and "outsider" in the community. Data can be validated through member checking, where researchers verify findings with community members.

Ethnographic analysis is linear and dynamic, allowing for modifications based on an ever-evolving understanding of the data collected. Integrating thematic and domain analysis in this framework allows researchers to identify patterns and themes that emerge from the data, enriching the interpretive process. The thematic analysis summarizes qualitative data, allowing researchers to select complex data into coherent themes that reflect participants' experiences and perspectives [21]. The flexibility of thematic analysis allows it to be adapted to various qualitative research contexts, making it a versatile tool in ethnographic devices [22]. Thematic analysis helps organize data and increases the credibility and depth of research findings, as it allows for systematic exploration of themes that resonate across contexts [23]. Ultimately, the synthesis of these elements culminated in a scientific article that contributed to a broader discourse in the field based on empirical realities captured through ethnographic research.

3 Results and Discussion

3.1 Coconut and its Cultivation in the Simeulue Community

Coconuts in Simeulue grow and are scattered along the coast of Simeulue Island and other small islands that are separate from the main island. According to [24], coconuts cultivated in Indonesia consist of three varieties, namely tall varieties, dwarf varieties, and hybrid varieties. The coconut variety cultivated by the Simeulue people is the Inner Coconut with the terminology of local wisdom of the island of Simeulu. Several names are known as Kelapa Dalam by the people of Simeulue, such as Coconut Island, Coconut Village, and Simeulue Coconut. Some people are still confused when asked about the coconut inside. However, they quickly understood if we called it Coconut Island—even people who work in CV. Rezeki Bersamah interprets deep coconut as an old coconut suitable for making flour. The name of Coconut Island is because coconut is believed to have originated from other small islands around the main island of Simeulue. Only then was it planted by the Simeulue community. The Simeulue community has its name for coconut; for example, for young coconut, the community calls it "balalu," mature/half-aged coconut is called "idafu," while old coconut is known as "bonol."

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The cultivation of coconut Cocos nucifera provides significant benefits through the versatile use of various components of this plant. Coconut fruit provides coconut water rich in electrolytes and nutrients, and it is used as a functional drink and a natural source of rehydration. Coconut meat, rich in saturated fatty acids, is the raw material for coconut oil in the food, cosmetics, and pharmaceutical industries. Coconut coir can be processed into fibers useful in the textile industry and mattress making. Strong and pliable coconut leaves are often used as raw materials for roofing, weaving, and various craft products. Besides providing a sustainable food source, coconut cultivation also significantly contributes to the local economy and the plant industry [25].

The morphology of coconut plants consists of roots, stems, leaves, flowers, and fruits. Details of the morphological specifications of coconut plants according to [24], consisting of roots, stems, leaves, flowers, and fruits. Meanwhile, the growth of coconut plants is divided into three phases: Phase 1, lasting for 4-6 months. In this phase, the shell and fibers only enlarge and are still soft. The embryonic hole also enlarges and is filled with water. Phase 2, lasts for 2-3 months. The shell gradually thickens in this phase but is not yet completely hard. In Phase 3, in this phase, a white embryo or endosperm is prepared, starting from the base of the fruit and gradually towards the tip. At the base, the embryo begins to appear, and the color of the shell changes from white to blackish-brown and becomes harder.

Coconut fruit comprises fiber, shell, coconut water, and pulp. The use of coconuts in Simeulue itself is still not optimal. Coconut coir, which should be used as a handicraft material, is still piling up and being wasted in the community's coconut plantations since the existence of CV. Rezeki Bersamah, which produces coconut flour and previously unused coconut shells, has now been used as fuel for production at the factory itself. Meanwhile, coconut water is still wasted due to the lack of public knowledge on how to treat it. The most common use of coconut is in the pulp of the fruit. Coconut fruit can be used as an additive in processed foods due to the presence of PT. Green Enterprises Indonesia focuses on producing virgin coconut oil, coconut cooking oil (CCO), coconut flour, and CV. Rezeki Bersamah, which produces coconut flour, can be said to have significantly increased the use of coconut meat. Usually the people of Simeulue only use coconut meat as an additive in processed foods, for example made into coconut milk, grated coconut, homemade virgin coconut oil or pliek u (dried rotten coconut) with a small production scale. So that after the presence of the two coconut factories, coconut meat has been used on a large scale. Most of the coconut harvest in Simeulue is supplied to the two factories. Some of them are still traditionally marketed for the consumption needs of people who do not have coconut plantations.

With the operation of 2 coconut processing factories in Simeulue, the demand for coconuts is also increasing. However, in particular, coconuts in Simeulue are unable to supply coconuts daily to the mill. In other words, Simeulue coconuts have entered an unproductive phase at more than 60 years old. To overcome the shortage of raw material supply, CV. Rezeki Bersamah was forced to import coconuts from Nias Island, the same variety as the coconut in Simeulue.

Meanwhile, PT Green Enterprises Indonesia (GEI) still uses coconuts in Simeulue because the production of VCO and CCO from coconuts in Simeulue is better than that of other coconuts. Due to the huge demand for coconuts in Simeulue, PT GEI has also created a coconut replanting program with partners who supply coconuts to their mills. In the next 5 or 6 years, these newly planted and cultivated coconuts will be able to replace old coconuts. So that the habitat of coconut plants remains and is maintained, based on age, the categories of coconut vegetation in Simeule Regency can be seen in the following table:

Table 1. Typology of Vegetation in Gardens and Their Conditions

Typology of Coconut Vegetation Based on Age	Description
> 60 years	- Deliberately planted during the colonial period - Believed to be derived from the best seeds - Maintained without special treatment
> 30 – 60 years old	- Grow naturally - Some come from natural seeds that fall
10 – 30 years)*	- Most of them grow naturally** - A small portion is deliberately planted with selected seeds*
< 10 years	- Most of the trees come from dwarf/unwanted trees. **

Source: Researcher Analysis, 2023

Note:

* In local knowledge, this period is the productive age of coconuts
* Frequently visited/frequented parks
** Rarely visited the park

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3.2 Harvest Practice Patterns and Challenges Faced

Coconut harvesting practices include a variety of technical and social aspects that affect how communities manage coconut harvests. One key dimension is the frequency of harvest, which can vary based on the coconut growth cycle and local or global market needs. Pruning practices are also an integral part of this theory, where pruning methods can affect fruit productivity and plant regeneration. This theory suggests that a deep understanding of coconut harvesting practices is important to identify implications for fruit availability and sustainability of coconut ecosystems.

In the context of coconut care and harvesting aspects, the cultivation pattern of coconut plantations on Simeulue Island can be divided into two main categories: those that are often visited and those that are not visited frequently. Coconut plantations that are often visited have special characteristics that provide an overview of the intensity of cultivation and maintenance activities [26].

Another relevant assumption relates to the influence of geographical factors on coconut harvesting practices. The topography and geographical location of a particular island or region can affect the intensity of community interaction with coconut plantations and the harvest patterns they apply. For example, accessibility to plantation sites in hard-to-reach areas can make harvesting practices more sporadic. This opinion highlights the role of the physical environment in shaping coconut farming practices and its implications for fruit availability [26].

The cultural linkage to coconut harvesting practices emphasizes that local cultural values and traditions can play an important role in shaping how communities perceive and manage coconut harvests. These include social norms related to the agricultural cycle, traditional celebrations related to harvesting, and local wisdom passed down from generation to generation. This emphasizes the importance of understanding the cultural dimension in the context of coconut harvesting practices to design more effective and sustainable management strategies [27].

The practice carried out by the Simeulue community is that coconut plantations that are often visited are usually marked by regular visits, with a frequency of at least once a week. This shows that the park's owner or manager is strongly committed to ongoing maintenance and monitoring. In addition, the harvesting practices often carried out in this garden show quite high productivity and are often intensified. The care and maintenance efforts implemented, such as land clearing, are an important step in maintaining the sustainability of this coconut plantation. This type of coconut plantation is located on Simeulue Island, which can be considered a center for sustainable coconut cultivation activities.

Another advantage of the coconut plantation that is often visited is its relatively easy access. This condition allows the owner or farmer to monitor and maintain the plantation more efficiently, even with the ability to return home the day after completing his or her task. Thus, a deep understanding of the characteristics and practices of coconut cultivation in the category of frequently visited plantations is essential in understanding the relationship between the sustainability of coconut cultivation and harvesting practices on Simeulue Island.

Simeulue Island, one of the main areas regularly visited in this study, is a significant representation of coconut harvesting practices. Coconut cultivation and harvesting practices are carried out repeatedly in this area, and the results of this study will help us better understand how these harvesting patterns can affect the sustainability of natural seedlings in smallholder coconut plantations on Simeulue Island.

Rarely visited coconut plantations are on small islands off the main island of Simeulue. These small islands include Mincau Island, Teupah Island, Siumat Island, Simeulue Cut Island, Pig Island, Linggam Island, Batu Berlayar Island, Penang Island, and other small islands. The intensity of visits to islands outside the main island is during the coconut harvest season, usually once every 3 (three) months. Coconut agents usually go to small islands; some can harvest in one working day (return home on the same day), and some have to stay overnight (because of the long distance and the wider coconut plantations on some small islands). To transport the harvested coconuts, additional facilities are needed, such as robin boats to cross the island, as well as pick-up trucks for land transportation to reach the coconut industry:

"The coconut plantation on Penang Island has an owner. I often transport crops from the plantations here. Three (3) owners harvest their coconuts regularly, about once every 3 to 4 months. They are not the harvesters, and they bring climbers to climb. Sometimes, these climbers also peel coconuts from their husks. Sometimes, the owner peels the coconut from its shell. After being brought to the mainland, there were 10 to 15 sacks of coconuts. Penang Island is not far from the mainland, just a 15-minute drive by Robin. So harvesting can be done in one day, from morning to afternoon, when they go home. It is not the agent who takes it, but the owner who harvests it himself (Interview with Jack Harmeer, August 27, 2023)

As Jack said, Penang Island is only 15 minutes away from Robin, so the coconut harvesting process can be done in a day. In contrast to Mincau Island, which takes almost 1 hour to get there. In addition, Mincau Island is also larger than Penang. So, the coconut agents who harvest the coconuts there usually leave in the morning and return in the evening. Some of these coconut agents also set up huts where they rest in between their jobs. However, it is not uncommon for them to spend the night on the island because they are too tired to return. The huts built were where they spent the night. This coconut agent consists of 3 to 4 coconut climbers acting as coconut

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peelers, robin drivers transporting coconuts to the mainland, and pick-up truck drivers to transport coconuts to the mill.]

On the other hand, the cultivation of rarely visited coconut plantations has very different characteristics. It tends to reflect lower intensity and access than frequently visited coconut plantations. The main indicator of rarely visited coconut plantations is the minimal frequency of visits, with an interval of at least once every three months. These plantations tend to have a mass harvest pattern, achieved by piling up many coconuts before peeling and sorting. Coconut plantations that are rarely visited also often do not receive special treatment in regular care or maintenance. This means that the soil and coconut plants may not receive enough attention, affecting the productivity and quality of coconut yields. Their location is generally spread throughout the island cluster around the main island of Simeulue, which is geographically remote and far from the main center of activity. Access to these plantations is limited, often requiring boats, and sometimes farmers have to spend the night during the harvesting process due to limited distance and access.

In the context of coconut cultivation, a deeper understanding of the characteristics and practices of rarely visited orchards is essential to explain the various challenges faced in maintaining the sustainability of coconut cultivation on Simeulue Island. These different harvesting practices and levels of care can significantly affect the productivity and quality of natural coconut seedlings in these areas.

A good coconut harvesting process is choosing old bunches characterized by slightly brown to brown fruit skins. Coconut harvesting occurs every 2-3 months by harvesting 2-3 fruit bunches. Harvesting can be done by climbing or using bamboo ladders and poles with a sickle attached. The cost of climbing coconuts in the South Teupah District varies quite a bit depending on the height of the coconut tree. If the height of the coconut stem reaches 5-6 meters, the climbing fee is Rp 6,000; if the coconut stem reaches 10 meters, the climbing fee is Rp 10,000. And so on, the higher the coconut stem, the higher the cost that must be paid.

On the outermost islands of the mother island, coconut agents have a special task to sort out which coconuts must be distributed to PT GEI and what types of coconuts must be supplied to CV Rezeki Bersamah. The coconut harvesting process is carried out like a regular harvesting process. The coconut trees will be climbed first, then the coconuts will be collected individually using a wheelbarrow in one location. Usually, the coconut collection location is close to the rest of the hut. The coconuts that have been picked and stacked are then peeled. This is done so that coconuts do not take up too much space during transportation, especially water transportation that only uses robin.

The coconut that has been separated from the fiber is then put into the sack that has been prepared. The sack containing coconuts was transported to the mainland using a robin ship. Then, on land, the coconuts are reloaded and transported using pick-up trucks to coconut factories. Unlike CV Rezeki Bersamah, who produces coconut flour that accepts coconuts from climbing and fallen coconuts, PT GEI only accepts organic coconuts that fall naturally from trees.

Therefore, PT GEI's partner agents have received a work agreement stating that organic coconuts from the factory are organic. So agents looking for coconuts on small islands around Simeuleu Island spend more time on the islands while waiting for the coconuts to fall to take home. Several agents also partner with both factories. So, they deliberately separated organic coconuts from climbing coconuts. Organic coconuts are intended for PT GEI while climbing coconuts are intended for CV Rezeki Bersamah. On the first day of work, they would collect fallen coconuts scattered around the coconut plantation. When it is certain that the fallen coconuts have been collected and finished, the coconuts are immediately peeled and distributed to the factory. This is done so that falling coconuts and climbing coconuts do not mix. Once the fallen coconut is sent to land, the agent will begin climbing the existing coconut. Then, collect, peel, and take it to the mainland to be distributed to CV. Shared Sustenance.

The Simeulue community implements a pattern of coconut harvesting practices based on the intensity of interaction between managers and plantations and plantation locations influenced by several factors that reflect the dynamics of local community life. First, geographical factors and the island's topography are important in determining harvest patterns. Varied geographical conditions, such as lowlands, hills, and coastal areas, present challenges and opportunities in managing coconut plantations. In addition, the level of accessibility to plantation locations is also a key factor that affects the intensity of interaction between managers and plantations. More hard-to-reach plantation locations can result in more sporadic or limited harvesting practices, while more accessible plantations tend to receive more intensive attention. In addition, cultural and social factors also play a role in the pattern of coconut harvesting practices in Simeulue. Local values, traditions, and community perspectives on coconut plantations influence management and harvesting. Differences in harvesting practices between communities on Simeulue Island can be arranged based on more intensive interaction with plantations and the uniqueness of each geographical location.

In the process, the sustainability of coconut harvesting practices also faces various challenges, especially social and cultural aspects. These challenges must be overcome to ensure that the coconut industry can continue to thrive without sacrificing the community's welfare. Some of the main challenges faced by the Simeulue community are: first, the occurrence of environmental degradation and climate change. As an island area, Simeulue often

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experiences climate change through increasing frequency of storms, droughts, and sea level rise that affect areas where coconuts are widely grown, which can threaten coconut productivity. Second, dependence on manual labor. The harvesting system still relies on manual labor, which will increase the risk value for old and towering trees.

On the other hand, manual labor is still less appreciated economically. This impacts the younger generation's lack of interest in being involved in this work and, of course, threatens the sustainability of the labor supply. Third, inefficient supply chains. Coconut supply chains are often long and inefficient, leading to lost income for smallholders and a waste of resources. In addition, the lack of infrastructure and post-harvest processing technology also reduces the added value of coconut products—fourth, unstable market prices. The price of coconuts in the market often fluctuates, making it difficult for farmers to plan for long-term production and investment. By understanding the various dynamics above, efforts to identify coconut harvest patterns by local characteristics to provide a basis for sustainable management and support the sustainability of the coconut cultivation ecosystem on Simeulue Island are important to be carried out.

3.3 Coconut Harvest Habitus in Simeulue and Surrounding Islands

The pattern of coconut harvesting practices that the Simeulue people have carried out for decades can be understood using the habitus concept from Pierre Bourdieu's thought. Habitus is a Latin word that refers to a condition, appearance, or situation that is typical or habitual, especially inside the body [28]. Bourdieu di [29] explains that habitus is a long-lasting and changing system of disposition (durable, transposable) that serves as a generative basis for objectively structured and integrated practice. As a character system, habitus can be interpreted as perceptions, thoughts, and actions that continue continuously for a long time so that they become habits that humans consciously or unconsciously carry out as agents in their social world. [30] explained that in some of his works, the concept of habitus is used not only by Bourdieu with one meaning but also with different meanings. First, habitus is a lifestyle that represents a certain social class. Lifestyle comprises tastes, beliefs, and systematic practices that characterize class. Second, habitus can be a skill that becomes a practical action that is not always realized, so it seems like a natural ability as if given by nature. Third, habitus can be an interpretive framework for understanding and assessing reality and producing life practices that are by the objective structure. Fourth, habitus concerns the values practiced, for example, diligence, tenacity, honesty, cunning, intelligence, and generosity. Fifth, habitus is an internal structure that is always in the process of restructuring. Habitus can be described as the result of internalizing the social world within a person or group. Therefore, the habitus of each person or group will be very different from the other depending on their position in the social world that shapes it. The concept of habitus guarantees the coherence of the relationship between the conception of society and the actor. It becomes an intermediary between the individual and the collective. Habitus allows the construction of the theory of social production of actors and the logic of action [31]. Therefore, the habitus of coconut harvesting practices of the Simeulue community can be analyzed by looking at the high demand for coconut raw materials, especially for the need for raw materials for the large-scale processing industry carried out by PT Green Enterprise Indonesia and CV. Shared Sustenance. In the context of the habitus of coconut harvesting practices among the Simeulue people, the pattern of harvesting habits is also determined by how they position the existence of coconuts as a plantation production commodity that supports the family economy. There is a situational difference between the era before and after the coconut raw material processing industry's entry, which has implications for the intensity of harvesting on Simeulue Island and its surroundings. If, before the entry of the coconut processing industry, the market demand for the availability of coconut raw materials was relatively low, then a different situation occurred after the entry of the coconut processing industry. The processing industry requires a large supply of raw coconut materials of standardized quality so that the factory can continue to produce them. This is very important because it has an impact on factory operations. Suppose the factory does not get a sufficient supply of raw materials. In that case, the production rate will automatically be hampered, making it less profitable in terms of business calculations. To ensure that the mill continues to operate, the industry is actively encouraging coconut plantation owners to reduce the production rate of their coconut plantations. Both through partnership schemes with companies and non-partnerships (transactions are limited to buying and selling coconut commodities between farmers and companies or agents who also supply to companies). The situation after the entry of this industry changed the socio-economic structure of the people of Simeuleu Island and its surroundings, which also had implications for changes in the habits of coconut harvesting practices.

Before further explaining the implications of changes in the socio-economic structure of the Simeulue community on the habitus of coconut harvesting practices, the general harvesting practices carried out by the community will be explained first. A good coconut harvesting process is choosing old bunches characterized by slightly brown fruit skins to completely brown. Coconut harvesting occurs every 2-3 months by harvesting 2-3 fruit bunches. Harvesting can be done by climbing or using bamboo ladders and poles with a sickle attached. Considering the many coconut trees harvested, plantation owners with large enough land pay wages to harvesters at a certain price. Both the harvesting process by climbing trees directly or using bamboo or poles on old trees so

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that the tree's height does not allow climbing because the risk is very high. The wages for coconut climbing that plantation owners must pay vary, although insignificant differences exist. This difference is mainly due to the difficulty of harvesting, especially regarding the height of the coconut tree to be harvested. One example is the wage level we found in the South Teupah District. If the coconut tree trunk height reaches 5-6 meters, then the climbing fee is Rp 6,000. If the trunk of the coconut tree reaches 10 meters, then the climbing fee is Rp 10,000. And so on, the higher the coconut tree trunk, the higher the cost that must be paid.

3.4 Implications of Coconut Plantation Harvesting Practice Patterns and Sustainability Solutions for Coconut Plantation Practices

As explained in the previous section, coconut harvesting practices differ according to the distance of the plantation location from the owner's house or residence. Plantations that are more accessible in terms of distance will have a more regular harvest pattern. This also includes maintenance, as the owner relatively often controls it. From the planting process and maintenance to harvesting after entering the productive phase, they experience a regular cycle. On the other hand, the location of the coconut plantation, which is relatively far from the owner's residence (a different island), is relatively uncontrolled and poorly maintained. The cost of distributing the harvest has increased because of the long-distance factor, or the weather is sometimes less friendly because of its location, which crosses the island.

Whether you realize it or not, the difference in coconut harvest patterns between the nearest and far plantation locations has systemic implications on the availability of superior coconut seeds, the productivity of fruit-producing coconut trees, and the quality of the fruit produced. Before explaining further the systemic impact of harvest patterns on the quality of coconuts, we will first explain how the Simeuleue people interpret the existence of coconut trees that have been an integral part of their lives for generations. This means that coconut is not only a commodity that is one of the mainstays of the lives of the current generation but also plays a role in supporting the economic foundation of the previous generation in addition to plantation and other agricultural commodities.

The management of coconut plantations is carried out from generation to generation. As Sri (40) stated, the coconut trees in her plantation are around 50 years old, and some are 70 years old. His father planted coconut trees and now continues to take care of them and take the fruits of those trees. Several other informants who have been interviewed also mentioned that the coconut plantation they own is a heritage coconut plantation. It is unethical for them to sell their coconut plantations or change the land. Because for them, their parents planted coconuts first, and from the products of coconut plantations, their parents raised their children. Then, it is time for their children to take care of the coconut plantation.

Furthermore, Sri (40) stated that the main purpose of their stay on the coast is to protect their coconut plantations from irresponsible people who pick fruits carelessly. Although we know that only plantation owners can pick coconuts if the fruit has fallen by itself, it has become common ownership. However, there are still those who carelessly pick other people's coconuts. After they live near the beach, every afternoon, there are always people who stop by to take pictures or sit on the beach; sometimes, there are also people who ask if they sell drinks and snacks. Finally, he thought of opening a canteen near the beach. The presence of tall coconut trees makes the location of the canteen he opens look shadier. In addition, it also makes for a better view, as expressed by an informant who said:

"If in the past our parents only got money from selling coconuts, now we can get money from selling coconuts and take advantage of the strategic location of coconut plantations as a tourist attraction for young people around. Even many people from Sinabang come here. Sometimes, long before they come here, they will tell us if they want octopus or lobster provided" (Interview with Sri, August 12, 2023).

Another reason people maintain their coconut plantations is that no other plants can grow on the beach. They have tried to grow watermelons in coastal areas, but they are not growing well. Some trees also rot, and some bear fruit, but the fruit is very small. Like most watermelons, the fruit is also hard and not completely red (Interview with Sahal, September 3, 2023).

In contrast to general garden management, which must be cared for intensively, coconut trees in Simeulue generally grow without significant maintenance. Coconut seeds are sown, then planted, and grow on their own. Some farmers fence off their coconut plantations, and some surround their coconut plants with prickly pandanus. This aims to prevent crops from being disturbed by livestock. The remaining coconut plants can grow naturally until they enter a productive age. They can produce fruits ready to be harvested periodically according to the time cycle, which is 3 to 4 months after harvesting.

Although not all plantations are intensively maintained according to modern coconut plantation industry standards, the quality of the coconut produced can generally be categorized as poor. It also depends a lot on the quality of the seeds planted. To see whether the coconut is good or not, it must be seen in its entirety from upstream to downstream, that is, from the nursery to the coconut that is ready to be harvested. This part of the nursery (availability of natural seeds) will be explained further because it implies the harvest pattern carried out by coconut

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plantation owners. Harvesting coconuts between locations close to distant locations has different implications for the availability of natural seeds that will be the seeds (hopefully) of productive coconut plants in the future. Harvesting in rarely visited orchards by picking only selected quality fruit has serious implications for the productivity of existing coconut trees today and in the future. Garden owners only take selected fruits that have a high selling value. The category of fruits with high selling value is that in terms of volume ranges from about 2 kg - 2.5 kg, 0.5 kg of pulp, and 0.5 liters of water. Only fruits in this category are taken for distribution to the market. The coconut processing industry and the traditional market absorb both. The practice of harvesting only selected fruits from gardens rarely visited by owners can be understood normatively. If all the fruits picked are transported without exception, then business calculations will be lost because fruits below market standards will not sell. Eventually, substandard quality fruits will be discarded. Fruits in this category are like fruits that garden owners do not expect because they do not have a high selling value. Therefore, from the beginning, this substandard fruit is left only in the garden by its owner. Some are piled up, and some are scattered irregularly in the garden area. Gradually, after a few years of being left scattered, fruits below these standards grow and become superior coconut-like seedlings prepared from the beginning for planting.

Some coconut trees in community plantations today come from substandard fruits (stunting seeds), which grow into coconut trees. Initially, the existence of trees in this category was not noticed much by their owners because, physically, the conditions were the same as those planted and came from selected seedlings. Noticeable differences appear when trees enter their productive age after 8 years and above. The main difference is seen in the volume of fruit produced. Trees that come from the rest of the sorting seeds that then grow produce fruit of poor quality. Considering that coconut trees take a long time to be productive, their owners leave them with substandard fruit quality alone. Some people who own coconut plantations do not realize that the low productivity of their plantations is partly due to harvest patterns that systematically have implications for the availability of seedlings. The failure to maintain the productivity of coconut trees in the early stages begins with a lack of understanding by residents regarding the categorization of seedlings or superior coconut trees. When asked about their knowledge of coconut trees, most people or farmers unanimously answer that as long as the tree bears fruit, it is still productive. They only use the fruit. The community considers the coconut tree good if there is still fruit.

The lack of public insight into good coconut cultivation results in low productivity. Generally, people or farmers cultivate plants in their gardens to meet their needs and their families' needs. With a low educational background, limited capital, narrow land tenure, and a sense of responsibility to meet their and their families' needs, farmers try to calculate the risk of their farming business as little as possible. The desire to keep up with the development of their agricultural business to increase crop yields is still being considered, but meeting the needs of their families is a top priority. "The general public's understanding of the quality of coconuts just by looking at whether the tree is still bearing fruit is a fundamental problem in seeing the chain of declining coconut productivity in Simeuleue.

On the other hand, the quality of coconut trees, as seen from the volume of fruit produced as a parameter of high-quality coconuts, has not been a public concern. The market demand that will absorb coconuts from community gardens has standards that apply to each company. As one of the largest coconut processing factories in Simeuleue, PT GEI, for example, only takes the best quality coconuts with certain criteria. In other words, no matter how many coconuts are available from farmers, not all of them can be absorbed by the coconut processing industry if they do not meet the standards set by the company. To answer this problem, there must be a paradigm shift among farmers, and to get good quality coconuts, it must start with selecting and sorting the best coconuts to be used as seeds. The cycle must be the same on plantations located near or far away (different islands). The implications of coconut plantation harvesting practices on the availability of natural seeds in the Simeulue community is an important aspect of understanding the dynamics of local coconut farming. This analysis of harvest patterns must consider the specific practices coconut farmers apply in managing their plantation products. Significant variation in harvest intensity, harvest cycle, and harvesting methods is used in different areas of Simeulue Island. Factors such as harvest frequency, pruning techniques, and coconut plant residue management systems can significantly impact the plant's reproductive cycle and natural seed availability.

Several things can be done to answer the above challenges as a form of concern. They can be discussed in policies born by the local government, namely, the implementation of agroforestry practices. Coconut integration systems with other crops in agroforestry systems can increase biodiversity, reduce soil erosion, and increase resilience to climate change [32] [33]. Mechanization and technological innovation are also important in answering the challenges of changing the cultural values of a society. Using coconut harvesting technology or mechanical aids can reduce reliance on manual labor and increase efficiency. Technological innovation can increase productivity and reduce job risks. Building shorter and more efficient supply chains through farmer cooperatives or partnerships with industry can increase farmers' incomes. A sustainable supply chain integration system can increase the added value of coconut products. In addition, developing high-value coconut derivative products, such as virgin coconut oil (VCO), coconut water, or industrial raw materials, can increase profitability [34]. Providing training to farmers on sustainable farming practices and business management is also a way to

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increase their capacity to adapt to market and environmental challenges. Educational programs can attract the younger generation's interest to get involved in the coconut industry. Finally, the government must support through policies that favor coconut farmers. Governments can play an important role through policies that support smallholders, such as subsidies, incentives for sustainable practices, and infrastructure development. By addressing these challenges through a holistic approach that involves technology, policy, and community participation, coconut harvesting practices can become more sustainable and provide long-term benefits for the environment and the economy.

Sustainable development, biodiversity conservation, and climate resilience are the three main pillars of closely intertwined environmental and economic debates. All three have a crucial role in ensuring that economic growth does not come at the expense of the environment and natural resources and ensuring that future generations can enjoy an equal or better quality of life than the current generation. Sustainable development aims to meet current needs without compromising the ability of future generations to meet their own needs. Biodiversity conservation is an important component of sustainable development because biodiversity provides vital ecosystem services, such as pollination, climate regulation, and the provision of natural resources. Biodiversity loss can threaten food security, human health, and well-being. Biodiversity is the foundation for sustainable development because it supports ecosystem productivity and resilience to environmental disturbances. Therefore, conservation efforts must be integrated into development policies to ensure economic growth does not damage natural ecosystems [35]. Biodiversity conservation is also closely related to climate resilience. Ecosystems rich in biodiversity tend to be more resilient to climate change because they can adapt and recover from disturbances. For example, species-rich tropical forests can absorb large amounts of carbon dioxide, thus helping to mitigate climate change [36]. Climate resilience refers to the ability of a system or society to anticipate, respond to, and recover from the impacts of climate change. Sustainable development requires an approach considering climate risks and ensuring that infrastructure, agriculture, and economic systems can survive climate change [37].

Sustainable development, biodiversity conservation, and climate resilience are intertwined and mutually reinforcing. Biodiversity conservation supports climate resilience and sustainable development by providing vital ecosystem services. Meanwhile, climate resilience ensures that sustainable development can survive in the face of climate change. Integrating these three concepts into environmental and economic policies is key to achieving a sustainable and inclusive future.

4 Conclusion

Referring to the data and discussions presented in this paper, several things can be concluded. Coconuts (Cocos nucifera) have a very important role in the lives of the Simeulue people, not only as an economic commodity but also as an integral part of their cultural identity. Coconut trees have become a valuable natural resource, providing benefits in various aspects of people's lives, from food and building materials to handicrafts. The practice of coconut cultivation and harvesting that has been passed down from generation to generation reflects deep local wisdom in managing natural resources in a sustainable manner.

In addition, Simeulue Island has experienced various geological events that affect the ecological dynamics of the region, including earthquakes and tsunamis that have shaped the current environmental conditions. This natural phenomenon not only impacts the physical aspects of the environment but also affects existing coconut farming practices. Local knowledge passed down orally from generation to generation is key to maintaining agricultural traditions and values such as respect for nature, hard work, and interdependence. This shows how important it is to maintain a balance between the use of natural resources and environmental conservation.

As demand for coconut products increases for the island's coconut oil and flour processing industry, new challenges arise in the sustainable management of coconut resources. The need for a consistent supply of high-quality coconuts has driven changes in harvesting techniques and even created a dependency on imports from outside the region. Research conducted using ethnographic approaches and direct observation reveals the importance of balancing modern production's demands and traditional agricultural practices. This emphasizes the need for a comprehensive resource management strategy that considers social, economic, and environmental aspects to ensure the sustainability of coconut cultivation in Simeulue. This study revealed several important findings regarding coconut cultivation practices on Simeulue Island:

Related to the conclusions formulated, there are at least several things that can be recommendations for various parties to support the sustainability of coconut cultivation in Simeulue, including:

a. The main priority for the Regional Government is to make regulations regulating sustainable harvesting practices. In addition, the government should provide technical and financial support to coconut farmers and facilitate training programs that focus on environmentally friendly cultivation practices.
b. For farmers, implementing a regular crop rotation system is an important step in maintaining the productivity of coconut trees. Regular tree maintenance is also important to ensuring plant health. In

addition, farmers need to maintain a balance between meeting industrial demand and ensuring the sustainability of coconut plant resources.

c. For the processing industry, the recommended step is to develop harvest standards that consider sustainability. Through empowerment programs, active collaboration with local farmers can have a positive long-term impact. In addition, implementing a fair pricing system is an effective way to drive sustainability and provide equitable economic benefits across the value chain.

Another thing that was also revealed was that this research had several limitations, including the geographical scope of the research location being limited to Simeulue Island, so the results could not be generalized to other areas. The second limitation is that in this paper, the historical data on traditional coconut farming practices documented is still relatively minimal, and the results of this study do not include an in-depth analysis of the economic impact of changing harvesting practices on farmers' incomes. The next limitation is the lack of quantitative data on the productivity comparison between traditional and modern harvesting methods and the absence of longitudinal studies that measure the long-term impact of changes in cultivation practices on the sustainability of coconut plants. However, this study provides an important foundation for understanding the dynamics of coconut cultivation on Simeulue Island, but more comprehensive research is needed to fill the existing knowledge gap.

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